

UNDERSTANDING THE GENDER DYNAMICS IN THE FINGER MILLET AND COWPEA  
SEED VALUE CHAINS: A CASE STUDY OF SENEGAL

A Thesis

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by

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## ABSTRACT

Access to quality seed and gender equality are key components to sustainable food systems, employment, food security and nutrition. Women make up the largest agriculture labor workforce, yet few are involved within the seed value chains. This study adopted a recently introduced village-based advisor (VBA) model to examine the gender issues that influence women and men's participation within the existing finger millet and cowpea seed systems in Senegal. Qualitative data collection methods such as key informant interviews and group interviews were used to collect information from project staff, traders, producers, and 'Yombalkaat' (community facilitators/ intermediary). The overall findings suggest that women continue to play a minor position in the seed system due to; existing policies and institutions; limited access to production assets; social beliefs and perceptions; presumed gender roles and participation in agricultural production.

## BIOGRAPHICAL SKETCH

Afiavi Caca Akibode was born in Togo where she attained her education until she came to the US as Humphrey with a focus on women empowerment in agricultural value chains. She holds a master's and bachelor's degree in project management and then in Business and Financial Management in Institut Africain d'Administration et d'Etude Commerciale a Lomé. She worked several years as a technical advisor in entrepreneurship respectively with International Labor Organization and the National Agency of Employment in Togo.

Afiavi received a Bouriez Fellowship from Institute for African Development at Cornell University in 2022. This fellowship enabled her to pursue a professional master's degree in international agriculture which had an emphasis on gender and development.

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## ACRONYMS

CASSI	Caribbean-Atlantic Seed System Initiative
COI	Center of Innovation
CIWA	Crop Innovation in West Africa
CNRA	Centre National de Recherche Agronomique
DISEM	Direction des Semences
DRDR	Direction Régionale de Développement Rural
FAO	Food and Agriculture Organization of the United Nations
GDF	Gender Dimensions Framework
GI	Group Interview
ICT	Information and Communication Technology
ILCI	Innovation Lab for Crop Improvement
ISRA	Institut Senegalais de Recherche Agricole
OPS	Opérateurs privés semenciers
SSG	Seed Systems Group
USAID	United States Agency for International Development
VBA	Village Based Advisor (or Agent)

## CHAPTER ONE: INTRODUCTION

Access to quality seed and gender equality are key components to sustainable food systems, employment, food security and nutrition. Quality seed is important for food security and thus constitutes the first node of the food value chain (Kramer and Galliè, 2020). Although women make up the largest agriculture labor workforce, few are involved in decision-making regarding seed management and distribution (Sarapura, 2012). Similarly, women are often the last to adopt improved seed varieties and agricultural technologies which could improve their yields. These constraints can be analyzed according to several dimensions, such as existing social institutions and policies; limited use and access to assets; beliefs and perceptions; practices and participation (Rubin, Manfre and Barrett, 2009).

Solutions to building a gender-responsive seed system have been proposed by various authors. For example, Fisher and Kandiwa (2014) examined gender differences in the adoption of modern maize varieties in Malawi using a nationally representative data to test the effectiveness of the Farm Input Subsidy Program. They found that factors like labor availability, land quality, and market access influenced adoption of modern maize varieties. Female household heads and wives in male-headed households had lower adoption rates compared to male household heads, even when considering other factors. Also, although the study found that the program significantly increased adoption rates among female household heads, this was not the case among male-headed households heads, possibly because of existing gender roles, preferences, and economic circumstances of men and women.

In a more recent rapid scoping review investigating the cowpea seed system in Mali, Isaacs and Diallo (2021) found that a majority of seed was acquired primarily from informal markets (trade and barter with family, neighbors, or a food market). Also, seed that was exchanged often came from traditional seed systems. The authors proposed three strategies that could be adopted to enhance the system and promote gender equality. Specifically, they proposed: use of (1) village-level demonstration to improve the utilization of seed technology; (2) design of appropriate policy based more on informal system or one that combined the formal and informal system (integrated system) to allow access to quality seed; (3) decentralization of the seed production to promote the availability of the seeds and the access to information.

### Statement of the problem

The majority of smallholder farmers in Senegal rely heavily on the informal seed sector primarily due to limited access to agrodealers (qualified seed traders), credit, and knowledge of new and improved varieties (Mabaya et al., 2017). More specifically, women have been found to rely on seeds saved from their farms or purchased from the local market (Venema and Eijk, 2004; Voss et al., 2021). Therefore, exploring gender issues that influence participation within the existing seed systems could help in understanding how interventions being introduced to promote food security could be improved.

This study reviews a recently (2022) “village-based advisor (or agent)” model that is currently being tested within the cowpea and finger millet value chain. This VBA model is being tested by the *Institut Senegalais de Recherche Agricole* (ISRA) and the Feed the Future Innovation Lab for Crop Improvement (ILCI) at Cornell University. The VBA model was developed by the Seed System Group (SSG), an Africa-based nonprofit (NGO), with the goal of improving the

distribution of improved seeds to farmers. The model is anticipated to give women the opportunity to be more involved in the seed distribution system in Senegal and ultimately promote food security and provide new opportunities for income.

Based on the project proposal materials, the VBAs are ideally chosen by community members and trained to support fellow farmers in adopting new agricultural technologies, e.g., seed varieties, fertilizer application, row spacing, and effective weeding among others. Acting as farmer leaders, they are encouraged to lead learning exercises and distribute 50 grams of sample packets of seed to other farmers to try on smaller plots. Subsequently, favorable outcomes from the experiments lead to investment (increased demand) for the new seed. The VBA model prioritizes use of private seed companies and cooperatives in developing a sustainable seed distribution network and builds on three key elements:

- Promotion of private-sector-led seed enterprises that can produce, process, package and market improved seed varieties.
- Promoting private-sector-led extension activities that promote the adoption of new seed varieties and production practices.
- Supporting national (public) crop breeding initiatives to effectively identify and introduce a range of enhanced crop varieties that are culturally appropriate and uniquely tailored to local environmental conditions.

Therefore, building a system that allows farmers to have access to certified seed is important. In this perspective, a collaboration was developed between the Innovation Lab for Crop Improvement at Cornell and ISRA in Senegal through the Caribbean-Atlantic Seed Systems Initiative (CASSi). The objective of this partnership is to ensure a consistent and reliable supply of improved, certified

seeds with higher yields and climate resilience to smallholder farmers in Senegal. Additionally, the aim is to establish a sustainable mechanism for providing farmers with new crop varieties long after the proposed activities have been implemented. For this purpose, three varieties especially pearl millet, cowpea and sorghum was selected since they have been identified as marketable, nutritious varieties grown in Senegal and playing a crucial role in insuring food security. This study focuses mostly on millet and cowpea.

Based on this knowledge, this study sought to examine how might the existing local seed systems in Senegal be supported to encourage women's participation in the cowpea and finger millet enterprise? To achieve this, the study asked the following questions:

1. What are the factors that influence women's and men's participation in cowpea and finger millet businesses?
2. How are decisions made on what seeds to buy and use in the household?
3. What type of opportunities might exist for women within the village level seed distribution system in Senegal?

### Research framework

This qualitative study adopted a gender dynamics framework to understand the various gender issues that influence both women and men participation in the cowpea and finger millet system. Using both key informant interviews and group interviews, the study investigated how existing policies and institutions, access to resources, perceptions, and practices influence participation within the seed value chains.

## Research justification and contributions

The International Labor Organization (2020) reports that women represent 37% of the formal agricultural workforce. Rural women are disadvantaged compared to men in terms of access to assets, resources, services, and opportunities. When it comes to business development, seed marketing and distribution, agricultural support services, extension and financial opportunity, the gap remains perceptible (FAO 2011). Senegal is not an exception in this situation and there are a few research studies that have examined women's participation within the seed systems. Though, numerous research projects were implemented to study women's access to agricultural resources in Senegal, fewer studies were done on women's and men's involvement in cowpea and millet value chain. Therefore, this study contributes towards the growing body of empirical works focused on promotion of gender equity within agricultural value chains.

## CHAPTER TWO: LITERATURE REVIEW

Women play a very important role in agriculture across the globe. In Sub Saharan Africa, most of the agricultural activities such as planting, weeding, and harvesting is done by women who are often not paid for this work. Still, despite their extensive engagement in the sector, a gap between women and men farmers access to productive resources such as land, information, remains (Adam and Muindi, 2019). In Senegal, most rural women's main source of income comes from agricultural production activities. However, many face barriers in terms of access to production resources such as land, capital, knowledge, and extension services when compared to men. For example, women have less control over land ownership compared to men and often their plots are smaller and of lesser value or/and quality. Women also have fewer animals compared to men and often have little control on use of the revenue generated from the sale of livestock.

Agricultural extension services often undervalue women's role in agricultural production (Doss and Morris, 2000; Doss, 2001). Similar to other African countries, men in Senegal are often considered to be the main decision maker in farming despite women's active participation. As a result, the majority of the extension services are geared towards men and persons often sought for information are men (Franzel et al. 2018). Investigating this phenomenon, Meinzen-Dick, et al. (2011), Magnan et al. (2015), Fisher and Carr, (2015), have all previously found that men often fail to discuss agricultural practices or management choices with their wives. Similarly, a study by Kristjanson et al. (2015) on farmers' adaptation to climate change found that fewer (65%) women received limited information on the predicted start of the rains compared to men (83%). As a result, women lag behind in adopting new agricultural practices and technologies.

A recent FAO (2023) study evaluating women's practice and participation in the labor market, particularly within the agribusiness found that women's jobs were categorized mainly as low-skilled, low-paid, informal, and casual jobs. As a result, women occupy lower jobs that offer insecure employment. In Senegal, the division of labor along the agricultural value chain varies depending on the crop or sector. For example, in the horticulture sector, men manage the marketing of onions and potatoes while women participate in selling vegetables such as peppers, okra, and tomatoes. Likewise, in the fishing sector, men are more involved in the capturing and wholesale trade of fish while women are engaged in the processing and retail (USAID, 2016).

Formal laws and institutional policies as well as customary law enhance practices and beliefs that are often discriminatory and limited in giving equal protection to women and men (Rubin et al., 2009). Various gender scholars have noted that gender roles and relationships often observed at the household level as well as within institutions shape behaviors within value chains. As a result, gender-related factors seen in labor markets, including hiring practices, job roles, and income distribution often mirror those observed at the household. Likewise, many of the regulatory frameworks that dictate, for example, property inheritance or ownership, are based on societal beliefs. As such, customary laws which champion men as property owners often disadvantage women (Rubin, et al., 2009).

In Senegal women represent 53% of the active entrepreneurs, however, less than a third (28%) have access to formal loans that often require land as collateral or other guaranteed assets. The customary law does not allow women to own property or inherit land from their fathers and husbands. In rural areas men have the right to use the labor of their wives and children in their own plots in terms of crop cultivation and harvesting. Also, women can only work on their own plots



after completing all the required tasks within their husband's field. In turn, due to the patriarchal law men have the obligation to provide the food and agricultural resources such as land, seed, and other agricultural inputs. Men often considered as plot managers and therefore, traditionally receive more agricultural extension support compared to women. Although women may own smaller plots of land, that are often provided by their husbands, decisions regarding land management are often taken by the husband (USAID, 2016).

### Cowpea and finger millet value chain in Senegal

In West Africa cowpea is considered an important grain with a lot of nutritional and economic value. Cowpea seed is a high source of protein, and its roots contain nitrogen that improves soil fertility. Additionally, cowpea stems and leaves are nutritious forage for animal feeding. Cultivated generally in semi-arid and low rainfall areas, farmers like cowpea because of their short growing cycle and their capacity to resist drought. Cowpeas represent a valuable seed since their production and marketing allow smallholders farmers to earn income.

In Senegal, cowpea is cultivated in the north and central parts of the peanut basin in Senegal, an agroecological zone that cover 80% of national production (Beye et al, 2022). Cowpeas contribute significantly to food security because it is a high source of protein and can be used as an income generation opportunity in rural areas (Beye et al, 2022). Hence developing cowpea production has become an important goal for the Senegalese government leading to the implementation of projects and programs, the development of new varieties, cropping techniques and storages technologies (Faye-Mané, 2017).

Cowpea production in Senegal mainly involves smallholder farmers who cultivate it both for family consumption and sale relying on different actors (with different roles) participating to the

distribution channel at different stages. This market channel is composed of producers, collectors, wholesalers and retailers, processors, and traders. Cowpea can be processed into different foods especially snacks foods, cowpea flour for infant foods. Also, dried seed and the green pod are used to cook different dishes such as “*Thiebou Niebe*” (rice, dried fish, cowpea) and *Ndambe* (boiled cowpea with oil, tomatoes, and spices). However, cowpea farmers' productivity is low (Beye et al., 2022) and they always encounter difficulties regarding their access to improve seed varieties, and high input cost that hinder their production. The cultivation of cowpea includes all the family members (women, men, and children) (Beye et al, 2022). Furthermore, women participate heavily in weeding while children are more present in planting and soil preparation activities. Both women and men are responsible for the harvesting since it needs a bigger labor force.

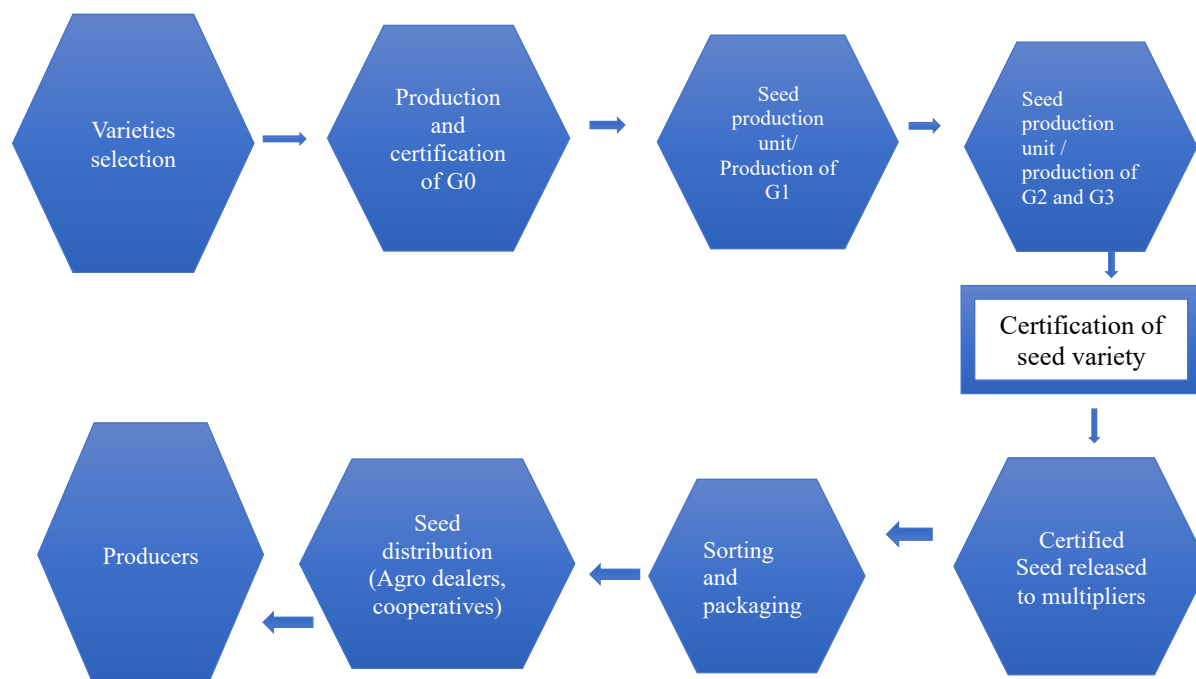
Finger millet (millet) is a primary agricultural food staple and represents 42.9% of the total harvest area in the country (Fall et al. 2022). Millet is cultivated in the semi-arid central zone of Senegal, especially in the peanut basin. Millet holds a significant position in Senegal's food security and has historically served as the primary daily food staple for rural communities. Production of millet over the last decade has declined due to various factors. For example, increased adoption of rice in the local diets in place of millet has led to lower production levels. Environmental factors such low rainfall and decreased soil infertility coupled with low quality seed varieties and high cost of fertilizers have also negatively impacted production (Faye-Mané 2017). The division of labor in producing millet involves men as heads of households to clear, till, weed, and manage what is harvested. Women sow and also help with harvesting and transportation of the produce to the household. Women's participation in millet activity can change depending on the region. A survey on the Senegalese farming systems for cowpea, millet, and peanut recently found that men are mostly present in the production process (90%) while women tend to contribute respectively to the

preparation of the land (15 to 16%), sowing activity (22 to 28%), weeding (37 to 42%), harvesting (41 to 55%) and (49 to 55%) for shelling (Kumar et al., 2022).

### Production and distribution of millet and cowpea seeds in Senegal

Agriculture is a priority sector in Senegal, however, a lack of access to certified seed by farmers is a key problem that contributes to farmers low productivity. Senegal has two seed production systems: the “formal” and the “informal” system. The *formal* system comprises of a seed value chain that is regulated by the state and where each actor in the system has a clearly defined role. These roles range from varietal selection to seed marketing in a process that involves breeder seed or foundation seed production, seed multiplication, quality control, conditioning, and certification (Senegalese Ministry of Agriculture, 2019).

*Figure 1: Seed certification process*



The *informal* system comprises the seed exchange networks that promote casual sharing or exchange of seeds between farmers. In this system, farmers select and save seed for future use using indigenous knowledge.

*Table 1: Senegal Formal Seed production process*

*Varieties' selection:* The varieties' selection is the first step for cowpea and millet certified seed production. At this level ISRA specifically the Centre National de Recherche Agronomique (CNRA) of Bambey through their breeders proceed to the selection of millet and cowpea varieties leading to the production of G0 certified as new varieties.

*Varieties' homologation:* After the varietal selection, new varieties of millet and cowpea are released through a procedure by which the varieties prepared for the inclusion in national and sub-regional catalogs are registered. During this stage the unit of seed production in CNRA produce the G1, G2 and G3 varieties called breeder seeds certified and control by the "Direction des Semences" (DISEM) of the ministry of agriculture.

*Seed multiplication:* this step involves actors with different profiles that proceed to the multiplication of R1 and R2 seeds. The private seed operators acquire the G1, G2 and G3 seeds from the seed production unit of Bambey and proceed to their multiplication. They finally produce the G4 (foundation seed) and G5 and G6 named respectively certified seed R1 and R2.

Those varieties are certified and controlled by the "Direction Régional du Développement Rural" (DRDR) of the Ministry of Agriculture. The multipliers are individuals or legal entities especially farmers organizations, individual multipliers, private companies generally named "Opérateurs Privés semenciers" (OPS). They are specialized in seed commercialization and are approved or licensed by the state. They contract in turn with producers who multiply the seeds in their own fields. After the multiplication the seeds are sorted and packaged. the multipliers proceed then to the distribution of certified millet and cowpea to farmers who will pay after the harvest.

The Senegalese formal seed production process of the cowpea and finger millet is based on a well-defined legislative framework and involves players with diverse profiles (Ministry of Agriculture, 2019). The figure and table above describe and illustrate the formal seed production process. The marketing and distribution of cowpea and millet certified seed is generally handled by seed operators including farmers' organizations, individuals, and private players (traders) approved by the Senegalese state (Ministry of Agriculture, 2019). Their role is to multiply the seeds and supply farmers at different levels. After the stage of multiplication those actors proceed to the marketing and the distribution of the cowpea and finger millet seed to the farmers. Those seeds marketing can be done through different channels:

*Direct sale:* traders supply through their companies where producers can buy the seeds. Those traders or agrodealers make also seeds available at the village level through an intermediary persons called “seed distributor or distribution relay or distribution leader” or “Yombalkaat” (in Wolof) who are affiliated to their companies or cooperatives where they get the certified seed and agricultural inputs.

*Notification:* In this case the government, to implement its seed subsidies programs, buys seed from OPS notifying them of its orders.

*The contracting process:* project and program or NGOs contract with OPS to buy the seeds in the framework of their producers mentoring project.

## CHAPTER THREE: THEORETICAL FRAMEWORK

Few studies focus on the appropriate seed distribution that would allow women and men equitable access to certified seed. Previous research shows that the seed system, particularly in terms of access, utilization and income is shaped by gender dynamics (Kramer and Gallie, 2020). Also, the quality of the seed is different depending on men or women and regarding the seed marketing the distribution channels are gender biased (Fisher and Kandiwa, 2014). Hence, creating seed systems that are responsive to gender differences can directly empower women by acknowledging their preferences, interests, and aspirations, and by overcoming obstacles to seed access (Puskur 2021). However, few research studies have examined seed distribution strategies that involved equitably women and men in West Africa specifically in the context of Senegal.

### Seed System

A seed system encompasses a series of activities aimed at variety development, seed production, and distribution to farmers. These systems are commonly classified into three types: formal, semi-formal, and informal. A formal seed system is distinguished by a well-regulated and organized process, covering activities from breeding to providing certified seeds of known and registered varieties to farmers.

The seed system in Senegal is characterized by both formal systems where the different actors are government institutions, private and non-governmental farmers-based organizations involved in seed production, public seed companies, agrodealers, etc. Though, the formal system is well organized in Senegal, farmers, especially women, tend to use the informal system (Ministry of

Agriculture, 2019) leading to the low of access to certified seeds in the whole system (Seed System group, 2021).

## Gender equality

Understanding gender inequality is important to explain gender equality. Gender inequality refers to a context in which there are:

“Hierarchical genders relations, with men above women, and women being regarded as inferior and less valuable solely by virtue of their sex. This gender hierarchy is manifested in family relationships, inheritance laws and customs; valuations of women’s work and its general invisibility; and the power to make decisions in society, the family, workplace, religious and other cultural institutions” (Mikkola and Miles, 2007:6).

The authors in turn explain that gender equality can be expressed through attitudes, beliefs, behaviors, and policies that reflect an equal valuing and provision of opportunities for both genders. In gender equality people have the same power and have to treat other people with respect and consideration despite their gender or sex (Nelson and England, 2002). Senegal agriculture shows this inequality where women face difficulties to access agricultural inputs comparing to men (FAO, 2011) and have lower access to certified seeds (Seed Systems Group, 2021). Improving women and men's access to seed and their role in the seed delivery system is important to make the seed system equitable. Though, the existing seed delivery model fails to consider the gender dimension or is still in the exploration stage (Brearley and Kramer, 2020), exploring the innovative VBA approach proposed in the CASSi project with a gender lens is an opportunity to see how the approach works and how it helps create a gender-sensitive seed distribution system.

## Village Based Advisor

The VBA model represents a private-sector driven approach to agricultural value chains whose objective is to increase marketable volumes and enhance the quality of agricultural produce. The model is based on the establishment of market connections between formal businesses (input suppliers, traders) middlemen's or intermediaries who are trained to build long lasting relationships with farmers and offer them a range of services. The formal business provides incentives for these intermediaries for their work. However, the village-based advisor (VBA) approach currently being tested goes beyond this definition. The village-based advisors are intended to be self-employed intermediaries between formal businesses and the farmers at the village level. They are recruited and trained to teach agricultural practices (how to cultivate the new seed using fertilizer, row spacing, weeding, and other modern practices) and distribute a consequent amount of small new pack (50 gram) seeds to farmers who participated in the learning exercise while growing the new varieties using a small portion of their land (Seed Systems Group, 2021).

The positive outcomes achieved on these small plots are expected to be sufficiently successful to persuade farmers to buy seeds and fertilizer in the subsequent season. This demand in turn will grow the market for seed companies and fertilizer suppliers. VBAs can also help farmers share knowledge and information, facilitated by information and communication technology (ICT). VBA and the formal businesses or input suppliers receive both intensive training in business practices and effective marketing approaches, tailored to reach smallholder farmers. While the approach allows seed companies to expand, the VBAs also have the opportunity to earn money as an entrepreneur where they have the possibility to move from the VBA position and become agrodealers. Hence the VBA approach proposed is not focus on giving incentives and training to the middlemen to offer agricultural services, but it is more focused on a self-improved approach



where the seed companies improve their skills and business opportunities and where the VBA interact as entrepreneurs grow their activity and create their own agrodealers' shops. The model, with its ICT aspect offers a new source of rural employment for young farmers more receptive to adopting and exploring new technologies.

ISRA is a government agency acting under the Ministry of Agriculture in Senegal with a support of the ILCI, at Cornell University to implement the VBA model. The goal of this project is to improve farmers access to seed, adequate information, and agricultural services at the village level. In addition to improving access to improved seed, the proposed model gives the opportunity for women and men to be trained and become a certified seed distributor at village level. To promote women participation, ISRA provides certified seed on credit basis with the expectation that once farmers have had a chance to try the new seed varieties, they will purchase larger quantities which will lead to sales and a sustainable entrepreneurial venture. The driving objective of VBAs is to widely disseminate seeds of newly registered varieties of millet and cowpea to key stakeholders and scale-up production. It is important to note here that the idea of VBAs is not new to Senegal. There currently exists community level agents commonly referred to as “*Yombalkaat*” (facilitator) in Wolof. Hence the VBA model seeks to identify how the local system might be improved.

## CHAPTER FOUR: RESEARCH METHODOLOGY

As discussed in previous sections women in agriculture contribute significantly to agricultural production. However, they have limited access to agricultural resources. The purpose of this study is to understand the obstacles women are facing as producers and entrepreneurs so as to propose some opportunities for building equitable seed systems of the cowpea and finger millet in Senegal.

To reach this goal, a qualitative study approach is adopted. I chose the qualitative approach because I want to understand the points of view of the project participants and their experiences. Qualitative research allows one to interpret peoples' perceptions and their observed practices, captures their views in their own words, on the *why* and the *how* of what they do, and their understandings of change over time (Doss and Rubin 2021). Another valuable feature of qualitative research is that during the research process, "the researcher is focused on learning the meaning that the participants hold about the phenomenon under investigation and "not the meaning that the researchers bring to the research or writers express in the literature" (Creswell 2009: 175). In this study, we want to avoid our own biases as researchers by listening clearly to participants' problems, and hopefully coming up with an appropriate solution for them.

This study explored the views and experiences of women and men regarding their involvement, the factors that affect their participation in cowpea and finger millet production, and the challenges faced in this value chain by asking the *how* and *what* questions. Specifically, it asks:

- 1) *How* are decisions made on what seeds to buy and use in the household?
- 2) *What* are the factors that influence women's and men's participation in cowpea and finger millet businesses?

- 3) *What* type of opportunities might exist for women within the village level seed distribution system in Senegal?

### Documents review

During the research process, the researcher sought out public documents (e.g., newspapers, official reports, peer reviewed articles) and private documents (e.g., personal journals, e-mails, project proposals and reports) to complement the primary sources of information obtained from the field. In particular, documents related to seed systems in Senegal, the Senegal census, ILO and USAID reports on gender assessment in Senegal, the Plan for Emerging Senegal (PES 2014-2018), PAP I (2014-18) and PAP II (2019-23) were examined.

### Research Design

This research is focused on investigating how women and men are involved in the cowpea and finger millet seed activities in Senegal, to understand the gender issues in the cowpea and finger millet value chain, especially how men and women are involved in the seed systems for access to, control over, and use of seeds for finger millet and cowpea, two of the targeted crops for CIWA.

Research data was collected from three regions (Kaolack, Diourbel and Kaffrine) and five districts (Sibassor, Nioro du Rip, Keur Soce, Segre Gatta, and Bambey). Kaolack and Diourbel are the two main regions in Senegal that specialize in millet and cowpea production. Both regions are also where ISRA is currently working with farmers, traders or other actors involved in those seed value chains. Kaffrine was added to this study because some of the agrodealers in Kaolack and Diourbel supply seed to producers in the neighboring villages.

Group interviews (GIs) were used because they allow researchers to get information from different people in their own words. Fontana and Frey (1991) argue that “group interview would avail the researcher of the opinions of a large number of subjects in a relatively easy-to-access fashion; it thus would complement any other method being used.”

The semi-structured interview technique allows researchers to collect open-ended data using the interview guide and by asking the questions out of order supporting follow-up questions in a way that naturally conveys the conversation. The rationale of this technique is to allow the exchange between participants and the interviewers while giving the opportunity to the respondents to open-up about a specific question and provide qualitative information that can be compared to the previous or future data. The semi-structured technique is used to provide guidance about the areas to be explored, but there is not a rigid structure (Flick, 2009). In this study I use the group interview discussion with the semi-structured technique to have a wider understanding of the context of the women and men participation in the cowpea and finger millet activity and explore the views of the different actors that surround the issue about women and men’s access to, control over, and use of the resources or the gender dimension in this value chain.

The interview questionnaire was designed based on the Gender Dimensions Framework (GDF) (Rubin, Manfre, and Nichols Barrett, 2009) to collect data on gender relations and to conduct an analysis of agricultural value chains in households, firms, communities, and the larger economy. Respondents included producers, traders or agrodealers, village-based agents, breeders, and project staff. The questions related to the four (4) dimensions of the GDF, specifically 1) practice and participation 2) access to and control over productive assets 3) social beliefs and perceptions

4) law, policies, and institutions, as well as attention to a fifth relationship of power, that influences each of the other dimensions (Rubin, Manfre, and Nichols Barrett, 2009).

To understand how men and women are involved in the finger millet and cowpea seed systems, field data was collected from three regions (Kaolack, Diourbel, and Kaffrine) and five districts (Sibassor, Nioro du Rip, Keur Soce, Segre Gatta, and Bambey). In addition to the interviews with value chain actors, key informants and ISRA project staff were also interviewed to obtain relevant information on the project.

### Research area description

Senegal is divided in fourteen (14) regions: Dakar, Diourbel, Fatick, Kaffrine, Kédougou, Kaolack, Kolda, Louga, Matam, Saint Louis, Sedhiou, Tambacounda, Thies, and Ziguinchor. This study was implemented in three regions: Kaolack, Diourbel and Kaffrine.

The Kaolack region covers an area of 5265 km<sup>2</sup>. It is one of Senegal's largest agricultural regions, accounting for 28.5% of the country's cultivated area (ANSD, 2012). Predominantly inhabited by the Serer, Wolof and Peulh ethnic groups, the Kaolack region is highly rural, and economic activities are essentially based on the agricultural sector. This region has a highly varied agricultural potential in terms of arable land (760,904 ha), soil types, crop types and stakeholders. This led to the development of many agricultural value chains as well as a multitude of agri-food processing businesses. Most of them run by women. The latter are mainly involved in processing cereals, fruit, and vegetables, and in marketing these products. They are also involved in agricultural production and other links in the chain (input supplies, marketing, distribution). Cowpea, millet, sorghum, and maize are among the cultivated crops.

Diourbel is also located in the peanut basin in Senegal. Characterized by semi-arid climate and tropical ferruginous soils, crop production focused mainly on dry cereals and legumes especially millet, sorghum, groundnut, and cowpea. The population relies heavily on agricultural production as the main source of income. Diourbel is specialized in cowpea production. However, its production yield is low (35 kg ha), the reason why it is considered as an associate crop instead of being a main crop, although it is recognized for its ability to protect crops from pests and disease, and to aid soil conservation (Beye et al., 2022). Cowpea is mostly used in Diourbel for animal feeding while in Kaffrine cowpea is used for marketing, and mainly household consumption. More farmers are willing to explore new varieties due to the presence of projects and programs and the proximity of extension services that facilitate farmers access to information. Although the majority of the household are headed by men, there are some households headed by women. Also, women's and men's participation in cowpea cultivation varies.

Kaffrine is a central Senegal region located in an area called "As Saloum" in Wolof (Eastern Saloum or the peanut basin in English). The region is composed by many ethnic groups such as Wolof, Fulani, Mandinka, Serer, and Bambara but Wolof ethnic is predominant, and Islam represent the main religion. Kaffrine is a predominantly agricultural region and depends heavily on seasonal rain. The region location is considered as "Agricultural Expansion Ecoregion/Zone d'Expansion Agricole (ZEA)." Kaffrine region (Almost 85% of the region) is rural with 75% of the population working in agriculture (ANSD 2015). Many crops are produced but millet and cowpea are mostly preferred or used by farmers because of home consumption marketing, objective and livestock feeding. The local cowpea and millet cropping systems in Kaffrine use only low applications of organic and chemical fertilizers. Few farmers use improved seed. This

low utilization of improved varieties is explained by the lack of seed and the lack of knowledge or information on those varieties.

In Kaffrine region, the head of household is mostly men and highly educated in Koranic religion. Women's and men's participation in agricultural labor differ depending on the activity. In fertilization labor and soil preparation activities, women's and men's participation tend to be the same. Women are less represented in threshing and harvesting activities. However, their participation in the weeding activities seems to be higher. Women's plots are mostly used for first sowing and weeding, which limits or prevents their production. Women's decision making in terms of plowing and planting is controlled by their husbands, but they have control over their crop selection.



*Figure 22: Map of Senegal research regions*

## Sample

This study was implemented in the Kaolack, Diourbel and Kaffrine regions where ISRA intervened. Given the fact that ISRA is already working with the different actors (producers, buyers, traders, seed units' companies, breeders), we have chosen a purposeful sampling strategy in terms of a sampling model.

Purposeful sampling as described by Palinkis et al. (2015) is a technique that entails identifying and selecting individuals or groups who possess substantial knowledge or experience on a particular topic with a willingness to participate and who have an ability to clearly communicate about their experiences.

The participants interviewed are respondents (women and men) who are active in different roles in cowpea and finger millet seed value chain in Kaolack, Diourbel and Kaffrine regions and where other research is being conducted under the larger ILCI-CIWA project. Respondents were also identified from a few seed companies. The topics covered in the interviews have included questions asking producers about their decision-making on agricultural production on the two target crops of finger millet and cowpea; asking seed company representatives and seed distributors about men's and women's different preferences for improved and local seed; and questions about men's and women's agricultural activities, including information about their access to, control over, and use of key productive resources such as land and inputs (see appendices).

To understand and operationalize those identified concepts (access to, control over, and use of resources), one hundred and twenty-four (124) participants (producers, traders or agrodealer and



VBA) including project staff have been interviewed. The interviews with the agrodealers and the VBA were mostly carried out in French and the ones for the producers were implemented in Wolof translated into French. The number of participants gathered in the different sites exceeded what I had planned, despite the instructions. This creates an important discrepancy leading from 40 total estimated participants to 124 really interviewed. The information was gathered from the following participants as illustrated on the table below.

*Table 2: Study Sampling Frame*

<b>Region</b>	<b>KAOLACK</b>			<b>Diourbel</b>		<b>Kaffrine</b>	<b>Total</b>
<b>District</b>	Sibassor	Keur Soce	Nioro du rip/Paos	Bambey/ Mabacke,	Bambey Keur Ngalou	Segre Gatta Nissem	
<i>Producers</i>	25= (5F+20M)	9= (9F)	13= (3F+10M)	28= (18F+10M)	18= (6F+12M)	16= (4F+12M)	109
<i>Vba</i>	2 (M)		1 (F)	1 (F)	1 (M)	1 (M)	6
<i>Agro dealers</i>	3 = (2F+1M)	1 (F)	1 (M)	1 (M)			6
<i>ISRA staff</i>							3
<i>Total</i>							124

### Data collection procedure

ISRA was an important aid regarding meetings with participants. ISRA manages the ILCI broader project and is working with the targeted actors (producers, agrodealers, VBAs). The organization helped us to identify and connect us with participants. ISRA's collaboration with local leaders also helped to identify and meet with farmers at the village level. I was also assisted by two research assistants (1 male and 1 female) during the field research implementation.

### *Key informant interviews*

Prior to conducting field research in Senegal, the staff interview was implemented via Zoom and WhatsApp. Due to the lack of availability of the staff members only one person was interviewed before arriving in the country. Two other persons were interviewed during the second week of my field research in Senegal. They agreed to consent on participating in the study by explaining the study's purpose, the risks, benefits of participation, and confidentiality of their data (see consent form template in the appendix). This interview allowed me to understand and obtain relevant information on the project, their opinions on the women's and men's participation in the cowpea and finger millet activities and receive their potential recommendations.

### *Group Interviews*

Six group interviews were conducted with smallholder farmers in Kaolack, Diourbel and Kaffrine regions, especially in the district of Sibassor, Nioro du Rip, Keur Soce, Bambey and Segre Gatta. It is face-to face semi-structured discussion context, allowing exploration of the questions on women's and men's access to, control over, and use of resources. In each case the discussion was recorded, and notes were taken by the researchers.

Before starting every GI we explained to the participants the purpose of the study, research procedures, expected benefits, their right to withdraw from the study at any time, and their protection in terms of confidentiality. I gave further opportunity to participants to ask any questions about the study. The contact information of the research team and the Cornell Institutional Review Board (IRB) was given to them in case of further clarification or report concerns or complaints.

## *Ethics*

Qualitative researchers must be concerned with many ethical issues throughout the research process, especially the steps of data collection, analysis, and dissemination of qualitative reports (Creswell 2009). Researchers should be aware of the key principles of good ethical practice when implementing research activities. During this study, I took the Institutional Review Board (IRB) training and got the research approval (IRB0147408) from Cornell University IRB before starting the field work.

Although Senegal does not have a local Institutional Review Board, I trained the field assistants on the different ethics issues regarding the importance of informed consent, confidentiality, and anonymity of the participants data, participant free and voluntary participation. Consent was obtained after explaining to the participants the study's purpose, the risks, the benefits of participation, the confidentiality of their data and their right to withdraw from the study anytime.

## *Study limitations*

- Time – the data was collected over a period of two weeks of which is not enough to completely capture all the information that would be required to have a deeper understanding of the various issues that women and men face. For example, some of the interviews had to be postponed due to deaths in the family. Likewise, other interviews were postponed allowing farmers the opportunity to sow their seeds.
- Language – the primary language spoken across the study regions is Wolof – therefore interviews had to be translated from French to Wolof and back again into French and English. This may have led to a loss of nuance in the transcripts.

## CHAPTER FIVE: DATA AND FINDINGS

This study aimed to understand the opportunities and obstacles women and men face along the cowpea and finger millet value chains in Senegal. This chapter presents both the data and findings based on interviews conducted with producers, VBAs, agrodealers, and ISRA project staff to answer the following three research questions.

1. How are decisions made on what seeds to buy and use in the household?
2. What are the factors that influence women's and men's participation in cowpea and finger millet businesses?
3. What type of opportunities might exist for women within the village level seed distribution system in Senegal?

### Decision making on purchase or use of seed.

In the studied regions finger millet and cowpea are managed differently. On one hand, millet is basic food crop managed by men reportedly because its cultivation requires a large piece of land, and men, as heads of the household, are expected to provide for their family. On other hand, cowpea is perceived to be a “women's crop” because its cultivation needs less space and can be intercropped and also used as source of income. Since women's plots are small, they focus on crops that use less land and can give them revenue opportunities. As a result, decisions on what seeds are purchased often lie with the man who controls the production resources.

Farmers across all three regions engage in production of various crops which can be broadly categorized as grains, legumes, vegetables, and fruits. Women in general reported cultivating a broad range of crops that included grains (e.g., millet), legumes (e.g., cowpea and peanuts), fruits

(e.g., papaya, banana, and lemon), flowers (e.g., bissap (hibiscus)), and vegetables such as tomatoes, peppers, and okra. Men on the other hand listed millet, maize, peanuts/groundnuts, and cowpeas. The following table presents a list of all the crops the producers listed when they were asked what crops they grew.

*Table 3: Types of crops grown by both men and women farmers in Kaolack, Diourbel and Kaffrine Regions*

What are the different crops you grow?		
Grains	Fruits, Flowers and Vegetables	
Millet	Hibiscus	Tomato
Maize	Okra	Lettuce
Legumes and Pulses	Eggplant	Cassava
Groundnuts	Tomatoes	Lemon
Cowpeas	Chili Peppers	Banana
	Watermelon	Cabbage
	Papaya	

Overall, men were identified as the primary decision makers on agricultural production because they were believed to be the heads of households. Although, some of the participants said that both (men and women) were involved in deciding what seed was purchased for planting, they overwhelmingly agreed that the final decision on what seed was to be purchased was eventually determined by the men because they were the head of household.

*“Everyone is free to look for crop varieties in the market to find the right seeds, but the final decision rests with the head of household, who compares the seeds that have been proposed to him or her” (Male respondent, Diourbel(Bambey))*

*Here, it is the men who generally have access to the land, which is why they make these decisions. But sometimes they give land to children or women. However, if they do give land to children or women, they do not play much part in the decision-making process. (Male respondent, Diourbel. (Bambey ))*

*“The final decision always rests with the head of the family but is preceded by internal discussions with the head of the family and his wife” (Male respondent, Paos).*

*The head of the household. Even if the land does not belong to him, he always gives permission. (Female respondent, Diourbel (Bambey))*

*“My husband, the head of the family, decides.” (Female respondent, Keur Soce)*

*“My husband is dead, and I have grown-up children, so it is up to them. (Female respondent, Keur Soce)*

Although some of the women reported being actively involved in deciding what crops were to be planted or saved for home consumption, they said that the final decision was often made by the husbands or older children who managed the larger portions of land. For example, in Keur Soce one of the women interviewed said that she made decisions on what crops to cultivate based on “my means and the land available.” On the contrary, another group participant noted that, “My husband is dead, and I have grown-up children, so it's up to them.”

*Here, it is the men who generally have access to the land, which is why they make these decisions. But sometimes they give land to children or women. However, if they do give land to children or women, they do not play much part in the decision-making process. (Female respondent, Diourbel)*

*“For millet, we keep part of the harvest for the next season if we have the opportunity. We do not buy for most of the time” (female respondent, Diourbel)*

There were a few women who reported being the primary decision maker in what seeds were purchased or used at home. For example, some women in Paos (Nioro du Rip) reported that in recent years they had increasingly gained more control and are actively participated in deciding what crops were to be planted and used at the home.

*“Thanks to our access to land, we're starting to make our own decisions about what crops or varieties to grow, which we didn't do before, when we didn't even have access to the inputs distributed in the village” (Paos, women group response)*

*“It used to be the man who decided what land to use, because women did not own land. But now that is gradually changing, thanks to the training we have received. Some of us are beginning to have access to land, and we are starting to be bold and take part in decision-making bodies. Men only make decisions about their own fields. For our fields, we make our own decisions, but only after discussion with the head of the household. In short, we are gradually becoming autonomous.” (Paos, women’s group response)*

Similarly, in Keur Soce, a few of the women who identified as heads of household said that they made the decisions on what crops were to be planted since their husbands were not engaged in farming.

*“At home, I’m the head of the family - my husband isn’t there, so I decide.”*

*“My husband is old and no longer farms, I decide for myself and the children.”*

Women who identified themselves as being the primary decision makers on what seeds were to be planted described themselves as having husbands who were not living in the home, passed away, or the *“husband is not interested in farming.”* Further, women in Keur Ngalou (Bambey), Nissem (Segre Gatta), Paos (Nioro du Rip), Mbacke (Bambey), Keur Soce (Keu Soce) reporting buying seed from a cooperative and the local market *“when do not find what we want with the cooperative. we go to the market.”* A few women from a Sibassor group said that *“we do not buy the seed. A part of the last harvest is kept and is used for the next season.”*

The cost of seed varies depending on where it is bought. The price of seed purchased in the local market or from neighbors is often set depending on the harvest and producer insights. For example, when asked about how they obtained reliable information on market prices, men in Diourbel said that *“At the end of the harvest, it’s all the local people who set a price for selling their crop, and if it’s seed prices, we get them from the traders.”*

### Factors influencing women and men's participation seed value chains.

Although there are existing cooperatives and distribution relays at the village level for cowpea and finger millet seeds, the majority of the producers lack access to certified seed due to existing social practices and institutional factors. Social practices such as seed saving and sharing contribute to the slow adoption of improved seeds which could improve yields. Similarly, institutional requirements for seed certification, limited extension support, along with ongoing subsidy programs slow entrepreneurial opportunities.

At the national level, agricultural products prices are fixed by the government, which sometimes leads to price gorging by some agrodealers who deliberately hold on to the seed until the price goes up. Likewise, the existing seed certification process, limited seed multipliers, coupled with strict agrodealer requirements slow access. Becoming an agrodealer requires one to meet some specific conditions. Based on existing licensing protocols by the Senegalese Department of Seed (Direction des Semences-DISEM), one is required to demonstrate that they have at least two hectares of land, working capital, seed management knowledge, and warehousing facilities. Often, some of these requirements are difficult to meet. For example, a young female agrodealers in Sibassor expressed that:

*“First of all, to become a seed trader or seller, you need to be licensed, have at least 2 hectares, be monitored by DISEM to see whether your seeds are improved or not, and be certified. On the other hand, the real question is how to get the network. It takes a lot of hard work.”*

In the selected regions, both women and men face difficulties to move their cowpea and millet produce to the market, but women situation is worse compared to men. Women often lack means of transportation (including money to pay for transport services) and therefore often have to walk



long distances with heavy loads of produce on their heads. On the contrary, some men use carts and bicycles for transportation. Lacking storage, many are often obliged to sell their produce at low price since they do not want to come back at home with the same heavy load.

***Access to financial capital:*** The majority of the agrodealers started their company with personal funding. Often traders operating as private companies need to establish legitimacy by demonstrating the following: sponsorship/guarantor, security/collateral, and business registration before they can access loans from the banks. For instance, an agrodealer in Sibassor operating a private company stated that:

*“I start with my own working capital. But at a certain moment of the development of the company I realized that I needed more financial support, so I got funding from a bank”.*

Cooperatives on the other hand, are often funded and supported by development projects. For example, when an agrodealer from Paos was asked to describe how their cooperative was funded, he said:

*“We did it slowly and surely, we had the funds we needed to get started. We received support while working with USAID Goungué Mbaye and Dooleel Mbaye projects. Even with USAID PCE and USAID Natal Mbaye, we had stakes that enabled us to have manuals for training, as well as to remunerate animators and staff.”*

Many of the agrodealers do not own the agricultural equipment nor transportation means that could enhance their capacity.

*“We need a Calibrator [machine to separate seed size] with the sizer you can separate the good seeds from the bad ones. We have a small machine that serves as a separator, but it is not enough” (Paos male agrodealer).*

*“In this cooperative, we only have one motorcycle. If we had cars and additional motorcycles, we could do more. We really lack logistical means” (Sibassor, female agrodealer).*

**Human capital:** The agrodealers lack appropriate human resources in the implementation of their activities. Most of them need agricultural technicians and specific training to improve their knowledge in the area.

*“I also need agronomic technicians; I'd like to be... I would like more skills in the agricultural field, agricultural technology especially in irrigation systems” (Sibassor female cooperative agrodealer).*

In Keur Soce a female agrodealer said that:

*“We also need to increase the number of training courses on leadership, gender, best practices, seed legislation and regulations.”*

*" We need technicians to get the technical work done on the field. We also need more training, specifically on technical procedures to plant new varieties” (Male agro dealer, Diourbel).*

The majority of the agrodealers state that the criteria to buy from a supplier are licensed breeder, reliable delivery of goods and convenient price. On other hand, most (all except one agrodealer) of the traders work with men as there are very few women supplying seed. Although one notes that *“women are very approachable and welcoming...compared to men who are very aggressive during negotiations”* (Sibassor male agrodealer), there are very few women traders. In terms of customers, traders often have more men than women primarily because:

*“Culture does not allow women to own their own land.” [If women inherit land (usually small plots) from husbands, automatically their purchase will be based on the means that they have. Hence lower purchase]. However, times are changing as one of the agrodealers did note that they were starting to see more women purchasing seed compared to other years. “I had more women than men this year. It's a special year” (Female agrodealer in Keur Soce).*

Overall, all agrodealers agreed that profit was a key indicator to their success. However, when asked to describe the ideal characteristics of a successful trader or buyer, great emphasis was placed primarily on virtues such as honesty and patience. In their view, a good trader needs to be a good listener as well as empathetic to their customers. However, it is also important to note that while both male and female agrodealers did agree that listening to their customers was a key attribute, the younger agro dealers (both men and women) did stress that traders and buyers needed to remain professional and supportive of each other.

*“Sometimes ISRA fails to deliver seed on time so, we cooperate with a young association (that is new and does everything good), because they also have good quality seed” (Female agrodealer in Sibassor).*

*“I faced a difficult situation where I did not have seed to sell but Kabir was a great help supplying me with seed” (Female agrodealer in Keur Soce).*

*“On the other hand, larger traders outsource and import their seed from India, which is often cheaper. I buy input locally, but I buy also from India” (Male trader in Sibassor).*

After all the perceptions shared by agrodealers in regard to the role women and men in the value chain are based on physiological characteristics such as body strength and traditional gender roles such as caregiving at home. For example,

*“I don’t recruit any women in my company to do any storage, moving, loading or unloading because such work requires a lot of energy and strength...women don’t deserve this treatment.”*

*(Sibassor, male agrodealer)*

Although women and men can perform the same jobs, their other responsibilities often get in the way. Women's home responsibilities mostly prevent them from performing field activity. For example,

*“I recruited a woman to monitor others in the field however, her husband kept on calling her to go back home.” (Sibassor, female agrodealer).*

A female agrodealer in Kaolack noted that while *“harvesting is tough for everyone ... because you have to be outside in the sun over a long period”* it is [more difficult for women with babies in their back]. However, women are perceived as very good in terms of seed sorting activity because they are very meticulous compared to men who are rough and do not respect the rule of sorting. *“I recruit more women for sorting because they do the job well and the final result is appreciable compared to men ” (Sibassor, female agrodealer).* Women are also perceived to be better in selling things and can be a good trader but, they are not able to do it because they lack access to the basic requirements (land, credit, knowledge).

### **Opportunities within village level seed distribution systems**

The majority (4 out of 6) agrodealers evolved from several state funded programs that were looking to improve seed distribution as far back as 2013. An example of one of the mentioned programs was Programme d’Appui aux Filière Agricoles (PAFA), an International Fund for Agricultural Development (IFAD) project that ran between 2008-2016 within the region. The project’s “goal

[was] to improve the income and livelihoods”<sup>1</sup> of farmers within the groundnut basin by integrating them into profitable value chains.

Mentorship and support from other traders, relatives (e.g., father) and company leaders play an important role in promoting one's success as a seed distributor. While discussing about one's reasons for becoming an agrodealer and what support they received, a woman who identified as a cooperative president shared that her experience while serving in a seed distribution committee led her to set up the cooperative she currently runs. A young man, who also identified as an agrodealer within his district explained that having watched his father over the years train and work as a government extension officer inspired him to work in the agricultural sector. Likewise, he saw the need and entrepreneurial opportunity the sector offered. Similarly, a young woman agrodealer from Sibassor who had a master's degree, described her engagement and interest as having grown out of her internship opportunity while working with the father at a cooperative. In Sibassor, a young man who identified as a youth leader in COOPEDELSI (Cooperative pour le Developpement de Sibassor) shared that:

*“After my university degree I join the COOPEDELSI, I received training on seed techniques since I don't have more knowledge in the area, I try to exercise this activity and then I have been able to start to distribute seed to farmers. The agronomic Technician help me a lot since I was close to him”*

Few women are formally engaged in seed distribution compared to men. Likewise, the seed distribution leaders or relays that currently exist evolved from different agricultural projects and opportunities within the regions. While some men relays used the training and mentorship opportunity in addition to their willing to become a relay, women relays evolved based on their

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<sup>1</sup> “Source: <https://www.ifad.org/en/web/operations/-/project/1100001414>

leadership in participating in group activity and their willingness to support the community. For instance,

*A female relay in Paos (Nioro du Rip) stated that “I was not around when the committee selected me as seed distribution leader; when I asked, the committee told me we chose you because we know the community know you well since you have already this willingness to help and the leadership ability in term of connecting with people”*

The government policy support is not appreciated at village level.

*“The government law policies are not well appreciated at the village level. The quality of seed supplied through the government subsidies program is not good and it hinders the farmers' productivity. The government pricing policy makes the situation difficult for farmers.”*

*“Sometime is sad to see that the cause of farmers low productivity come from officials while we are fighting to help farmers to access to quality seed” (Sibassor male relay).*

*“The government fix the products price low, and this is not helpful for the farmers when seeing the effort made” (Sibassor male relay).*

However, the government fertilizers subsidy program is interesting on relays perspective.

*“Fertilizers cost high and without the subsidies it will be difficult for farmers to access them. “I found the government fertilizers subsidy program very supportive because without this support farmers cannot buy fertilizers” (Sibassor male relay)*

Most of the relays are supporting the community to access the seed on a volunteer basis. They are not business entity: *“As a farmer I know how producers are struggling to have access to qualify seed, so I decided to support my community to fix this issue” (male relay in Sibassor).* Only a few are operating as business.

*“I am doing this as a business, I buy the seed and add my profit margin before selling it to the farmers and this help me to earn money” (male relay in Sibassor and youth leader in COOPEDELSI)”*

In terms of access to capital, most relays receive the seed from the cooperative on a credit basis and then proceed to its distribution to the farmers who will pay back after the harvest.

*“I don’t give any money before taking the seed since I am working for the cooperative. Farmers make requests for seeds, and I collect their needs and then distribute the seeds. But the payment for those distributed seeds will be made after the harvest by farmers” (Bambey female relay).*

However, a few relays started the business with their own fund.

*“I started with my own fund so I can buy seeds cash from the cooperative or buy them on a credit basis. farmers can pay as soon as they receive the seeds or pay later after the harvest” (male relay in Sibassor and youth leader in COOPEDELSI).*

Access to capital to start the relay activity is not a big challenge for all the relays since they have the possibility to buy the seeds on a credit basis. However, their main challenge resides in the availability of the quality or certified seed because sometime the cooperative lack of certify seeds.

*“I usually received the seed from the cooperative, but the problem is that sometimes I don’t find the seed that I need with the cooperative” (male relay in Sibassor).*

Men relays have their own plots inherited from father or family while women relays inherited small plot of land from husband.

*“I have my own land around 5 hectares that I am managing now but I received it from my father” (male relay in Segre Gatta).*

*“I have a small land which is not mine. If your husband has 4 hectares and 2 wives, he'll grow millet and groundnuts on the 3 hectares and the remaining part is shared between the two wives. But you won't be the owner of that plot” (Bambey female relay)*

*“I am cultivating 2 plots that used to belong to my husband. When he died, the children let me continue to cultivate on those plots. But at the beginning I just have a small plot of land” (Nioro du Rip female relay).*

The majority of the relays think that there is a difference in terms of crop preference depending on men or women. *“Men prefer to buy millet and women usually buy cowpea since they do not have a lot of space and they use it for animal feeding and selling reason. However, some women used to buy millet as well” (Bambey Female relay)*

Both women and men relays think that the seed distribution job can suited for both sexes. For men, women can do the job as a relay, but they need to have a strategy and time and transportation means.

*“Women can easily do this job since it does not need a lot of strength. They need just only to have a strategy to cooperate with farmers and the cooperative” (Sibassor, male relay).*

*“Women can do it, but they need more time” (Segre Gatta Male relay).*

*“Women can easily do this job if there are transportation means” (Bambey female relay).*



Table 4: Knowledge of VBA and reported reasons on why one is a community-based seed distributor.

Region	KAOLACK			Diourbel		Kaffrine
District	SIBASSOR			BAMBEY		Niassem segere
	<u>Identified community seed distributors in research districts</u>					
	<u>Ousmane (Male)</u>	<u>Ndene (Male)</u>	<u>Fatou (Female)</u>	<u>Tenigan (Female)</u>	<u>Ndiaye (Male)</u>	<u>Cisse (Male)</u>
How did you hear about the VBA opportunity?	<i>I am relay but have no information</i>	<i>I am relay but have no information</i>	<i>I do not have any information about VBA. However, I am a distribution leader</i>	<i>No information</i>	<i>No information</i>	<i>I am relay but do not have any information on VBA</i>
Why were you interested in the seed business?	<i>I have already land after finishing my university study.</i>  <i>I was thinking about how to become a big producer.</i>  <i>I joined the cooperative and started farming.</i>	<i>Growers need quality seeds; I can help them get quality seeds because I know what they need.</i>	<i>There are people who didn't have access to inputs. So I decided to help</i>	<i>It makes it easier for growers to access seeds, and at the same time reduces the cost of transport and access problems.</i>	<i>Good yield after using the new seed; got a lot of money.</i>	<i>Growers need quality seeds; I can help them get quality seeds because I know what they need.</i>

Regarding the means of transportation, the majority of men who are relays have a motorcycle, while women who are relays pay for a cab or motorcycle to supply the farmers in seed. For example, male relay in Sibassor said *“I go with my motorcycle or carts If there are seeds to distribute.”* And for female relay in Bambey to state that *“When I need to supply the farmers or collect the orders, I pay for a cab or, if it's not too far, I pay for a motorcycle and bring the orders to headquarters of the cooperative.”* Also, there is difference between women and men regarding the crop purchase especially the quantity and the frequency. Men buy mostly millet and in quantity. However, women buy a small quantity of cowpea on a regular basis. For instance, *“for millet men buy mostly, for cowpea women buy mostly. However, women who are the head of the household can buy millet for the family.”* (Sibassor, male relay)

The seed distributors also find that women are creditworthy than men.

*“Women always respect their commitment. Women avoid getting in trouble, they buy in small quantity, and they are ready to pay their debt”* (Bambey male relay)

Government law and policy make the situation difficult for agrodealers. All the agrodealers find that the government subsidy policy is destructive for both farmers and traders. For example, some of the agrodealers interviewed felt the quality of seed supplied through the govt subsidies program is often of lower quality. Likewise, they noted that *“when the government offers farmers subsidized seed, most agrodealers lose money”* due to a loss in sales. Also, instead of using the local seed multipliers as the main suppliers of the seed distributed through the subsidy program, *“the government prefers to import the seed from external suppliers in India”*. Therefore, from the traders' perspective: *“this situation is not helpful and does not encourage the promotion of seed business since they are the ones who are always fighting on the ground helping the community to have access to quality seed.”*

*I don't like this subsidy program. It slows down our sales a bit. The government doesn't give quality subsidies, the State gives the seed for free, and the producer gets it for free, it is difficult to sell our product and even if the government contracts with us he doesn't pay" (Sibassor Male agrodealer).*

Beyond their profit objective, agrodealers are aware of the existing gap regarding the farmers' lack of access to certified seed and really want to help their community to overcome this situation. They also want to use this business opportunity to create jobs for youth to solve as they can the unemployment problem.

*"Leading a seed business is an opportunity to make the company successful by earning money and at the same time create rural employment."*

Often, agrodealers' main activity is focus on seed selling such as cowpea, millet sorghum, peanut etc. However, some of them offer other agricultural inputs especially fertilizers, pesticides, and extension services by recruiting some animators that monitor farmers activity in terms of planting procedure, adequate use of fertilizers.

Overall, it is evident from the field data obtained that increased programming focused on women empowerment within the regions over the last two decades have created opportunities for women participation within the seed value chains. At the household level, few of the women are actively involved in decision making regarding what seed is purchased and left home for consumption. At the market level, some of the women are involved as VBAs, cooperative leaders and agrodealers. For instance, interviewed male agrodealers in Sibassor and Paos described women suppliers are "creditworthy" as well as "very approachable and welcoming" contrary to men who were perceived to have "aggressive behavior."

Regarding the VBA concept, the relays at the village level do not have a clear idea about the concept. They relied on the local model that they call “seed distribution leaders or relays” where their responsibility is to facilitate the access of seed to the farmers at the village level.

*“I have not heard about the VBA model but what we have here is called seed distribution leader and we support the community to access the seed” (Female distribution leader in Nioro du Rip)*

While the older perceive the VBA role as voluntary, the younger view it as a business opportunity. For example, in Sibassor (Kaolack Region) one of the young men interviewed saw the “VBA activity [as] a business opportunity. I am making money by adding a profit margin to the cost of the seed that I buy from the cooperative before selling it to farmers at the village level.”

## CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

Access to quality seed and gender equality are key components to sustainable food systems, employment, food security and nutrition. Women play an important role in crops production and yet remain limited in decision making regarding what seed is planted, sold, or kept at home for consumption. The findings from this study show that while strides have been made over the last decade to promote gender equality and poverty reduction along the agricultural sector, prevailing social norms along with institutional systems slow women participation within the seed value chains.

The majority of the women still own small plots of land which hinder their participation in for example seed multiplication and trade. While some effort has been made to improve women situation in term of access to land, the customary law still prevails. Recognizing access to land as a key entry point into the seed systems, the sector could benefit if the existing licensing protocols pegged to (2 hectares of land) were reviewed to allow women with smaller plots to become community seed multipliers or agrodealer.

Government sponsored subsidy programs that offer farmers cheaper seed often compete with agrodealers. Likewise, policies that promote price fixing of agricultural input often contribute to price gouging. To promote the local businesses and ensure that farmers have increased access to quality seed, the government should increase its engagement with VBAs and other local seed businesses in the development of its seed system instead of importing seeds from abroad. Additionally, beyond the partnership the government should respect its financial commitment by paying on time those companies selected. Doing this, the government would strengthen the local businesses, secure the channel of seed delivery, and improve farmers access to certify seed.

The majority of women have less access to land than men. Those lands are often inherited from the husband and are generally small. Improving women's access to resources will increase their participation in the cowpea and finger millet system. Development program should be focused not only on training program but also the development of micro-loan programs that provide women with the basic financial support to allow them to evolve in the sector. Additionally, this study shows that women farmers feel stronger when they are in group, so bringing women together as a group while supporting their business activity will allow them to improve their income and buy rural land that they can exploit as a group. The development of incubation programs that provide both technical and financial support will help those women in the process of their business development.

In term of access to seed, women and men are facing the same problem due the lack of the seed from the cooperative they are affiliated to. Simplifying or easing the condition currently required, for example, become a seed multiplier could help increase their participation within the seed value chains. The current perception on women's involvement in seed activity is that it is difficult for women to be involved in field activity because of their home responsibilities. Recognizing that perceptions about gender roles, particularly in regard to children care and domestic work slow women participation within the seed value chains, social interventions that for example, promote shared decision making particularly in seed purchase could promote women entrepreneurship at the community level. Equally, given that women often manage food and nutritional needs, their inclusion in deciding what seed remains at the household could further contribute towards food security.

Based on the field data collected, one can argue that the VBA model introduced remains limited due to two main reasons. From an institutional (ISRA) perspective, the VBA model is perceived as providing both women and men employment within the cowpea and finger millet value chains. However, at the community level, VBAs are perceived to be volunteers who serve as facilitators commonly known/ referred to as “relay”, “*leader villageois*” (in French) or “*Yombalkaat*”.

Recognizing that *Yombalkaats* serves as intermediaries between producers and the formal market, and that the VBA model offers complimentary tools that can be used to improve the existing seed value chains, ISRA program staff should develop training material that specifically targets and blends both local and new knowledge.

## BIBLIOGRAPHY

- Adam, R.I. and P. Muindi. 2019. Gender Dynamics in Seed Systems in Sub-Saharan Africa and Worldwide Lessons Workshop: Report of Proceedings of the Multi-stakeholder Technical Workshop. Mexico, CIMMYT.  
<https://repository.cimmyt.org/bitstream/handle/10883/20702/61357.pdf>
- Agence Nationale de la Statistique et la Demographie (ANSD). 2015.
- Agence Nationale de la Statistique et la Demographie (ANSD). 2014.
- Agence Nationale de la Statistique et la Demographie (ANSD). 2012.
- Beye, A., P.B. Diakhate, O. Diouf, A. Faye, A. K. Obour, Z. P. Stewart, Y. Assefa, D. Min, and P.V. Prasad. 2022. Socio-Economic Constraints of Adopting New Cowpea Varieties in Three Agro-Ecological Zones in the Senegalese Peanut Basin. *Sustainability*, 14 (21); 14550. <https://www.mdpi.com/2071-1050/14/21/14550>
- Brearley, E. and B. Kramer, 2020. Gender and promoting quality seeds in Africa: A literature review. ISSD Africa Working Paper. Washington, D.C.: International Food Policy Research Institute for the Integrated Seed Sector Development Program for Africa (ISSD) and the CGIAR Research Program on Policies, Institutions, and Markets (PIM). [https://issdafrica.org/wp-content/uploads/2020/12/gender-and-promotion-of-quality-seeds\\_litreview\\_issd-africa\\_-b.kramer-e.brearley\\_2020.pdf](https://issdafrica.org/wp-content/uploads/2020/12/gender-and-promotion-of-quality-seeds_litreview_issd-africa_-b.kramer-e.brearley_2020.pdf)
- Creswell, J. W. 2009. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. (3rd ed.) Thousand Oaks, CA: Sage Publications.  
[https://www.ucg.ac.me/skladiste/blog\\_609332/objava\\_105202/fajlovi/Creswell.pdf](https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf)
- Doss, C. R. 2001. Designing agricultural technology for African women farmers: Lessons from 25 years of experience. *World Development*, 29 (12): 2075–2092.
- Doss, C. R., & M. L. Morris. 2000. How does gender affect the adoption of agricultural innovations? The case of improved maize technology in Ghana. *Agricultural Economics*, 25 (1): 27-39.
- Doss, C. R. and D. Rubin. 2021. Exploring women’s empowerment using a mixed methods approach. IFPRI Discussion Paper 2035. Washington, DC: IFPRI.  
<https://ebrary.ifpri.org/digital/api/collection/p15738coll2/id/134478/download>
- Fall, S. T., G. Kanfany, D. D. Serba, Y. Diao, O. Sy, A. Fofana, G. P. Morris, and N. Kane. 2022. Genetic Improvement of Pearl Millet in Senegal: Past, Present and Future Prospects in Kane, N., D. Foncéka, and T. J. Dalton (eds). Crop Adaptation and Improvement for Drought-Prone Environments. Kansas State University with Press



- Books. <https://kstatelibraries.pressbooks.pub/feed-the-future-innovation/chapter/genetic-improvement-of-pearl-millet-in-senegal-past-present-and-future-prospects/>
- Faye-Mané, N. F. 2017. Les déterminants et l'impact de l'adoption des semences certifiées de mil et de sorgho dans le bassin arachidier du Sénégal. Thèse de Doctorat, Université Cheikh Anta Diop de Dakar. [https://www.bameinfopol.info/IMG/pdf/these\\_nffm\\_vf.pdf](https://www.bameinfopol.info/IMG/pdf/these_nffm_vf.pdf)
- Fisher, M., and E. R. Carr. 2015. The influence of gendered roles and responsibilities on the adoption of technologies that mitigate drought risk: The case of drought-tolerant maize seed in eastern Uganda. *Global Environmental Change*, 35: 82-92. <http://manuscript.elsevier.com/S0959378015300303/pdf/S0959378015300303.pdf>
- Fisher, M. and V. Kandiwa. 2014. Can agricultural input subsidies reduce the gender gap in modern maize adoption? Evidence from Malawi. *Food Policy*, 45: 101-111. <https://repository.cimmyt.org/bitstream/handle/10883/19758/30488.pdf>
- Flick, U. 2009. An introduction to qualitative research, London: Sage Publications.
- Fontana, A and J. Frey. 1994 "Interviewing: The Art of Science." in N. Denzin and Y. Lincoln (eds). *The Handbook of Qualitative Research*. Thousand Oaks, CA.: Sage Publications. <https://jan.ucc.nau.edu/~pms/cj355/readings/fontana%26frey.pdf>
- Food and Agriculture Organization. 2023. The Status of Women in Agrifood Systems. Rome: FAO. <https://www.fao.org/3/cc5343en/cc5343en.pdf>
- Food and Agriculture Organization. 2011. The State of Food and Agriculture 2010–11: Women in agriculture. Closing the gender gap for development. Rome: FAO. <https://www.fao.org/3/i2050e/i2050e00.htm>
- Franzel, S., A. Ndiaye, and J. Tata. 2018. Senegal: In-depth Assessment of Extension and Advisory Services. Developing Local Extension Capacity Project. USAID, Washington D.C. <https://www.g-fras.org/en/component/phocadownload/category/86-senegal.html>
- Global Green Growth Institute. (2019). Senegal Social Review. Seoul: Global Green Growth Institute. [https://gggi.org/wp-content/uploads/2020/01/GGGI\\_Senegal-Social-Review\\_December-2019-2.pdf](https://gggi.org/wp-content/uploads/2020/01/GGGI_Senegal-Social-Review_December-2019-2.pdf)
- Isaacs. K., and C. Diallo, C. 2021. Identifying the Gaps and Opportunity for Research in Cowpea Seed System in Mali. Paper prepared for the Innovation Lab for Legume Systems Research. East Lansing, MI: Michigan State University. <https://www.canr.msu.edu/legumelab/uploads/files/Scoping%20Report%20Isaacs%20and%20Diallo%202021.pdf>

- Kramer, B., and Galiè, A. 2020. Gender Dynamics in Seed Systems Development. PIM Synthesis Brief. Washington, DC: IFPRI.  
<https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/134158/filename/134369.pdf>
- Kristjanson, P., Q. Bernier, E. Bryan, C. Ringler, R. Meinzen-Dick, and Y. Ndour. 2015. Implications of gender-focused research in Senegal for farmer's adaptation to climate change. Project Note 02. Washington, DC: IFPRI.  
<https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/129754/filename/129965.pdf>
- Kumar, S., A. N. D. Yessoufou, P. Houessionon, N. Worou, and A. Whitbread. 2022. Senegal Cluster Baseline Report. Prepared by Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA), CIAT, and Alliance Bioversity International.  
<https://cgspace.cgiar.org/bitstream/handle/10568/126562/AICCRA%20Baseline%20report%20final.pdf>
- Mabaya, E., M. M. Diack Ba, M. Ndiaye, and M. Mugoya. 2017. Senegal Brief 2017–The African Seed Access Index. The African Seed Access Index, Nairobi.  
<https://wp.tasai.org/wp-content/uploads/2022/01/Senegal-brief-2017.pdf>
- Magnan, N., D.J. Spielman, K. Gulati, and T. Lybbert. 2015. Information Networks Among Women and Men and the Demand for an Agricultural Technology in India. IFPRI Discussion Paper 1411. Washington, DC: IFPRI.  
<https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/128949/filename/129160.pdf>
- Meinzen-Dick, R., A. Quisumbing, J. Behrman, P. Biermayr-Jenzano, V. Wilde, M. Noordeloos, C. Ragasa, and N. Beintema. (2011). *Engendering Agricultural Research, Development and Extension*. Washington, DC: IFPRI.  
<https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/126799/filename/126995.pdf>
- Mikkola, A. and C. Miles. 2007. Development and gender equality: consequences, causes, challenges and cures. Discussion Paper 159. Helsinki: Helsinki Center of Economic Research.  
[https://www.researchgate.net/publication/43610432\\_Development\\_and\\_Gender\\_Equality\\_Consequences\\_Causes\\_Challenges\\_and\\_Cures](https://www.researchgate.net/publication/43610432_Development_and_Gender_Equality_Consequences_Causes_Challenges_and_Cures)
- Nelson, J. and P. England. 2002. Feminist Philosophies of Love and Work, *Hypatia*, 17 (2): 1-18.
- Palinkas, L., Horowitz, S. Green, C., Wisdom, J., Duan, N. and K. Hoagwood. 2015. “Purposeful sampling for qualitative data collection and analysis in mixed method implementation research.” *Administration and Policy in Mental Health and Mental Health Services Research* 42(5): 533-544.
- Puskur R., (2021) Toward seed systems that bring benefits and empowerment for women.  
<https://gender.cgiar.org/news/toward-seed-systems-bring-benefits-and-empowerment-women>

- Rubin, D., C. Manfre, K. Nichols Barrett, K. 2009. Promoting Gender Equitable Opportunities in Agricultural Value Chains: A Handbook. Prepared by DevTech Systems under the GATE project. Washington, DC: USAID. [https://pdf.usaid.gov/pdf\\_docs/pnaeb644.pdf](https://pdf.usaid.gov/pdf_docs/pnaeb644.pdf)
- Sarapura, S. 2012. Gender analysis for the assessment of innovation processes: the case of Papa Andina in Peru. In World Bank (eds.) Agricultural innovation systems: an investment sourcebook. Washington, DC: World Bank.  
[https://www.academia.edu/1480546/Gender\\_Analysis\\_for\\_the\\_Assessment\\_of\\_Innovation\\_Processes\\_The\\_Case\\_of\\_Papa\\_Andina\\_in\\_Peru](https://www.academia.edu/1480546/Gender_Analysis_for_the_Assessment_of_Innovation_Processes_The_Case_of_Papa_Andina_in_Peru)
- Seed Systems Group. 2021.
- Senegalese Ministry of Agriculture. 2019.
- USAID. 2019. Village Agent Model Study: Likely effects on the Ugandan Agricultural Sector. [https://agrilinks.org/sites/default/files/resources/dlec\\_village\\_agent\\_model\\_study.pdf](https://agrilinks.org/sites/default/files/resources/dlec_village_agent_model_study.pdf)
- USAID. 2016. Gender assessment in the agriculture sector. Report prepared by MSI. Washington, D.C.: USAID. [https://pdf.usaid.gov/pdf\\_docs/PA00N5SJ.pdf](https://pdf.usaid.gov/pdf_docs/PA00N5SJ.pdf)
- Venema, B. and J. van Eijk, J. 2004. Livelihood strategies compared: private initiatives and collective efforts of Wolof women in Senegal. *African Studies*, 63 (1), 51-71.
- Voss, R. C., T. Jansen, B. Mané, and C. Shennan. 2021. Encouraging technology adoption using ICTs and farm trials in Senegal: Lessons for gender equity and scaled impact. *World Development*, 146, 105620.

## APPENDICES

## Appendix A: Agrodealer Interview Guide (English)Date of Interview

Participant ID#\_1xxx\_\_\_\_\_

Location of interview (Village)

Age of Respondent

Name of Respondent

Marital status

Sex of Respondent

Education level

Tell us about your decision to become a buyer or trader.

Was there someone else involved in your decision?

What benefits do you expect to receive from this work?

### ACCESS TO ASSETS

Is this enterprise owned by a man or a woman? (Note is a married couple or other type of partnership. (Get age of the owner if possible.)

What are the crops/animals/products that you trade?

Please estimate how many buyers/traders in your area for the crops you purchase/sell are men. How many are women?

What kinds of resources do you need to be a buyer/trader?

How did you get the funds to start your trading business?

What services or assistance would help you in your business? (e.g., type of training, access to credit, other)

### PRACTICES AND PARTICIPATION

Who carries out the day-to-day operation of the business?

What hours do you work?

Do you have employees? If so, how many employees (men/women?)

How many employees are under 35?

How do you/your employees get to and from work?

What kind of jobs do men and women do in the business?

What criteria do you use to decide whether to buy from a supplier?

Have you noticed any differences in buying from men and from women? Please describe.

Do you have more men or women as customers?

### BELIEFS AND PERCEPTIONS

What are the characteristics that make a successful buyer/trader?

Are there aspects of purchasing/trading that are believed to be more difficult for men, women or youth?

What is an example of such a task? Why is that?

Are there types of jobs that men/women/youth are discouraged from doing?

What is an example of such a task? Why is that?

Do you think young men are interested in work as traders? Why?

Do you think women are interested in work as traders? Why?

### LAWS, POLICIES, REGULATORY INSTITUTIONS

Are there laws or policies that make it hard for you to run your business? (e.g., labor laws, tax or permit requirements, regulations about quality, about transportation regulation, export tariffs)

## Appendix B: Village-Based Agents Interview Guide

Date of Interview

Location of interview (Village)

Name of Respondent

Sex of Respondent

Education level

Participant ID#\_1xxx \_\_\_\_\_

Age of Respondent

Marital status

### INTRODUCTION

1. Tell us about your decision to start selling or distributing seeds.
2. How did you hear about the VBA opportunity?
3. Why were you interested in the seed business?
4. Was there someone else involved in your decision to participate? Who was that?
5. Please tell us about making the decision to sell/distribute seeds.
6. Did you participate in the VBA training that was offered by ISRA?
  - a. [if yes] when did you attend this training?
  - b. Can you briefly describe the topics that were covered in that training?
  - c. Have you had training on business development/ running your business? (if yes, ask who)
7. What benefits do you expect to receive from your participation as a VBA or seed distributor?

### ACCESS TO ASSETS

1. Is this enterprise owned by a man or a woman? (Note if married couple or other type of partnership and get age of the owner if possible)
2. How did you raise the funds to purchase/obtain the business?
  - a. Did you have any challenges obtaining the capital you needed to start this business?
3. Please explain if there would be different or similar challenges for men/women/young men/young women [Depending on the identity of the respondent].
4. Do you have any employees?
  - a. How many?
  - b. How many are men?
  - c. How many are women?
  - d. How many of these employees are below age 35? (men/women)
5. Do you offer credit to your purchasers?
  - a. Are men or women more likely to receive credit from the business? Why do you think that is?
  - b. Are there additional barriers for young people (compared to older adults) to receive credit from the business?
6. Do you have your own plot on which you grow [this crop]?
  - a. What is the size of this plot?
7. How did you obtain this plot?

## PRACTICES AND PARTICIPATION

8. Can both men and women do this work?
9. If not, please explain why you think that is the case. What kind of jobs do men and women do in the business?
10. How do you get to and from the places where you obtain or buy seeds?
11. How do you get to and from the places where you distribute or sell seeds?
12. What are the costs of transport?
13. How do you find the farmers who want the seeds you have?
14. Do you have more men or women as customers? Why do you think that is?
15. What differences do you see in purchases made by men and women producers?

## BELIEFS AND PERCEPTIONS

16. Do you believe that men or women are better suited to particular jobs in your business? Why is that?
17. Are there differences in men's and women's preferences in purchasing inputs, e.g., timing, pricing, and size?
18. Do you believe there is a difference in how men and women use these inputs/materials in their enterprises? (Provide example)
19. In your opinion, are men or women more creditworthy? Why?

## LAWS, POLICIES, AND INSTITUTIONS

20. Are there laws or policies that make it hard for you to run your business? Please explain.
21. What regulations do you know that affect types of work that men and women are allowed to do?

## Appendix C-1: Producer Group Discussion Interview Guide (English)

Date of interview

Location of interview (village)

Sex of Respondents

### INTRODUCTION

1. Tell us about your decision to start selling or distributing seeds.
2. How did you hear about the VBA opportunity?
3. Why were you interested in the seed business?
4. Was there someone else involved in your decision to participate? Who was that?
5. Please tell us about making the decision to sell/distribute seeds.
6. Did you participate in the VBA training that was offered by ISRA?
  - a. [if yes] when did you attend this training?
  - b. Can you briefly describe the topics that were covered in that training?
  - c. Have you had training on business development/ running your business? (if yes, ask who)
7. What benefits do you expect to receive from your participation as a VBA or seed distributor?

### ACCESS TO ASSETS

8. Is this enterprise owned by a man or a woman? (*Note if married couple or other type of partnership and get age of the owner if possible*)
9. How did you raise the funds to purchase/obtain the business?
  - a. Did you have any challenges obtaining the capital you needed to start this business?
10. Please explain if there would be different or similar challenges for men/women/young men/young women [Depending on the identity of the respondent].
11. Do you have any employees?
  - a. How many?
  - b. How many are men?
  - c. How many are women?
  - d. How many of these employees are below age 35? (men/women)
12. Do you offer credit to your purchasers?
  - a. Are men or women more likely to receive credit from the business? Why do you think that is?
  - b. Are there additional barriers for young people (compared to older adults) to receive credit from the business?
13. Do you have your own plot on which you grow [this crop]?
  - e. What is the size of this plot?
14. How did you obtain this plot?

### PRACTICES AND PARTICIPATION

15. Can both men and women do this work?
16. If not, please explain why you think that is the case. What kind of jobs do men and women do in the business?
17. How do you get to and from the places where you obtain or buy seeds?
18. How do you get to and from the places where you distribute or sell seeds?
19. What are the costs of transport?
20. How do you find the farmers who want the seeds you have?
22. Do you have more men or women as customers? Why do you think that is?
22. What differences do you see in purchases made by men and women producers?



### BELIEFS AND PERCEPTIONS

23. Do you believe that men or women are better suited to particular jobs in your business? Why is that?
24. Are there differences in men's and women's preferences in purchasing inputs, e.g. timing, pricing, and size?
25. Do you believe there is a difference in how men and women use these inputs/materials in their enterprises? (Provide example)
26. In your opinion, are men or women more creditworthy? Why?

### LAWS, POLICIES, AND INSTITUTIONS

27. Are there laws or policies that make it hard for you to run your business? Please explain.
28. What regulations do you know that affect types of work that men and women are allowed to do?

## Appendix C-2: Producer Group Discussion Interview Guide (French)

Parlez-nous de votre décision de devenir agriculteur.

Quelqu'un d'autre a-t-il été impliqué dans votre décision ?

Quels avantages tirez-vous de votre activité d'agriculteur ?

### **ACCÈS AUX BIENS/RESSOURCES (INSCRIRE LES RÉPONSES DANS LE TABLEAU CI-DESSOUS)**

1. Quelles ressources utilisez-vous pour votre production? (terre, main-d'œuvre, intrants, équipement, animaux)
2. Avez-vous accès à la terre? (répéter pour toutes les ressources)
3. À qui appartient le terrain que vous utilisez/cultivez? (répéter pour toutes les ressources)

<b>Ressources</b>	<b>Accès (Avez-vous accès au:</b>	<b>Propriété (qui est propriétaire?)</b>	<b>Commentaires</b>
Terrain	Oui		
Travail			
Semence (nouvelle variété de Niébé)			
Seeds (new variety of finger millet)			
Autres intrants (Ex: engrais ou pesticides)			
Équipement lourd (par ex. tracteur, charrue, hangar de stockage, autre)			
Animaux/ bétails			

4. Pouvez-vous m'en dire un peu plus sur la façon dont vous obtenez les liquidités (capital) nécessaires pour soutenir votre production agricole? (accès au crédit, aux subventions, aux prêts, etc. - reçus d'une banque, d'une coopérative, d'une ONG, d'amis, de la famille, d'un voisin, d'un autre).

5. Comment obtenez-vous des informations fiables sur les semences améliorées/nouvelles variétés?

6. Comment obtenez-vous des informations fiables sur les prix du marché?

## **PRATIQUES ET PARTICIPATION (PRISE DE DÉCISION)**

7. Parlez-nous du travail que vous faites spécifiquement pour produire cette culture, depuis l'obtention des semences et des intrants jusqu'à la récolte.
8. Qui prend les décisions concernant
  - a. le terrain utilisée pour produire cette culture?
  - b. le choix des cultures (ou des variétés) à produire?
  - c. de l'endroit où vous achetez la variété de semences que vous plantez?
  - d. la quantité de niébé/mil gardée à la maison ou vendue?
  - e. Qui négocie les prix pour la vente de la récolte (niébé/mil) vendue?
9. Qui sont vos acheteurs?
  - a. Comment faites-vous parvenir votre produit à votre acheteur?
10. Qui perçoit/ a qui revient le revenu de la vente de cette culture?
11. A quoi sert le revenu de la vente de la culture (niébé/mil)? Qui en décide de l'utilisation?
  - a. Quelles sont les dépenses dont vous êtes personnellement responsable dans votre ménage?
12. Expliquez comment vous financez les investissements destinés à améliorer ou à étendre la production agricole.
13. Y a-t-il d'autres cultures ou activités que vous aimeriez produire et qui, selon vous, pourraient vous rapporter plus de revenus? (Essayez de comprendre si le revenu est destiné à l'usage individuel plutôt qu'à celui de la famille).

## **CROYANCES ET PERCEPTIONS**

14. Pouvez-vous donner un exemple de certains aspects de la production qui sont difficiles pour vous parce que vous êtes une femme/un homme?
  - a. Serait-ce la même chose pour les jeunes et les personnes âgées?
15. Pouvez-vous donner un exemple de certains aspects de la production que les femmes ou les hommes sont découragés à exercer?
  - a. Serait-ce la même chose pour les jeunes (et pour les personnes plus âgées)?
16. Y a-t-il des aspects de la vente et du marketing qui sont difficiles pour vous parce que vous êtes une femme/un homme?
  - a. Donnez-en un exemple.
  - b. Serait-ce la même chose pour les jeunes (et pour les personnes plus âgées)?
17. Quelle partie du processus de vente et de marketing pensez-vous devoir approfondir?
  - a. Comment essayeriez-vous d'obtenir ces informations?
18. Pensez-vous que les femmes courent des risques (de violence ou de réputation) en se déplaçant pour commercialiser leurs produits? Veuillez donner un exemple.

## **POLITIQUES ET INSTITUTIONS**

19. Êtes-vous membre d'une association de producteurs?

20. Pensez-vous qu'il est préférable pour vous de faire partie d'une association composée d'hommes et de femmes plutôt que de femmes ou d'hommes uniquement? Pourquoi?

21. Pensez-vous que les politiques agricoles actuelles en matière de certification et de distribution des semences vous rendent difficile l'accès à de nouvelles variétés de semences? (Demander une explication à la réponse fournie).

## Appendix D: ISRA Project Staff Interview Guide (English)

Date of interview	participant id#_1xxx_____
Location of interview	age of respondent
Name of respondent	marital status
Education level	Sex of respondent

1. Tell me about your work and responsibilities.
2. Does any of your work involve supporting women farmers and other agri-entrepreneurs?
3. (Probe: On which crops does your work focus (if not answered in Question #1)
4. In your opinion, what value chain activities are easier for women/men?
5. In what location(s) in Senegal do your project(s) operate?
6. How does the organization decide what types of gender issues to address?
7. How do you monitor your program impacts on women?
8. How do you evaluate your program impacts on women?
9. In your opinion, what changes to current policies (either by the national government or within ISRA ) could improve participation in and benefits from the seed system for women agri-entrepreneurs?
10. What are your suggestions for strengthening agripreneurship skills programming?
11. Explain the specific role that [your organization] can play in strengthening agripreneurship skills programming.

### **THEME: THE COWPEA AND FINGER MILLET SEED DISSEMINATION ACTIVITIES (VBA)PROGRAM**

12. Are you familiar with the cowpea and finger millet seed dissemination activities program using village-based agents?
13. How does your organization/program/entity contribute to the cowpea and finger millet seed dissemination activities program for the VBA?
14. Are you also involved in other seed dissemination activities for cowpea and finger millet? Please explain.
15. Is there anything you think should be changed about the cowpea and finger millet seed dissemination activities program to strengthen women's engagements in and benefits from agribusiness?
16. What strategies do you think would help the program reach more women farmers and entrepreneurs?

## Appendix E: General Consent Form (English)

Hello, my name is Afiavi Caca Akibode and I am a graduate student at Cornell University. I am currently conducting a research study for my master's thesis that is focused on understanding how women, men, and youth in Senegal are involved in the production and selling of cowpea and finger millet. My Faculty Advisor for this study is Dr. Fridah Mubichi-Kut, from the Applied Economics and Management Department, and Global Development Department at Cornell University. This effort is part of the work of the USAID-funded Innovation lab for Crop Improvement implemented by Cornell University with the Center of Innovation in West Africa (CIWA) under the Institut Senegalais de Recherches Agricoles (ISRA) in Dakar, Senegal.

The purpose of this research is to help us understand the factors that promote women, men, and youth participation in the production and selling of cowpea and finger millet. To gain a deeper understanding of your practice, I will ask you various questions regarding what motivated you to become a seed distributor, types of resources accessed as well as challenges you face in either buying or selling cowpea and finger millet. Your participation in this interview is voluntary. If you choose to participate, you may refuse to answer certain questions, or you may stop participating at any time. There is no foreseen risk or discomfort to your participation in this study, except for the time (approximately 1 hour) that the interview or discussion will take. There are no direct benefits to participating in this study. However, the information obtained will help improve farmers' access to better-quality seeds, information, and market in Senegal.

This is not an evaluation and there are no right or wrong answers. Information collected here is confidential and no one will be able to identify you or your household. I ask for your support by responding to the questions as honestly and fully as possible. Your answers will not be identified as coming from you, although your comments may be reported as being from a youth or adult man or woman from a general location (such as a district). The answers you provide will not be shared with regulators or any accreditation team.

In case you have any further questions after our interview today, you can reach me via phone at +1 406- 550-0812, your local chief, or ISRA's office (+221-33-859-1725). If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) for Human Participants at Cornell University at +1 607-255-5138. You may also report your concerns or complaints anonymously through Ethicspoint by calling toll-free at 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint so that anonymity can be ensured.

Thank you for taking the time to participate in this research!

This consent form will be kept by the researcher for five years beyond the end of the study.

- |   |  |
|---|--|
| <input type="checkbox"/> <b>I understand the materials above and agree to participate in the study.</b> | <input type="checkbox"/> <b>I give permission for my picture to be taken and used in this study.</b> |
| <input type="checkbox"/> <b>I do not consent and would like to exit the study</b>                       | <input type="checkbox"/> <b>I do not give permission for my picture to be taken.</b>                 |

## Appendix F: Consent Form/ Producer Group Interview (French)

### **ACTEUR DE LA CHAÎNE DE VALEUR: DISCUSSION AU SEIN D'UN GROUPE DE PRODUCTEURS**

#### Formulaire de consentement

Bonjour, je m'appelle Afiavi Caca Akibode et je suis étudiante en troisième cycle à l'université de Cornell. Je mène actuellement une étude de recherche pour ma mémoire de fin de cycle qui vise à comprendre comment les femmes, les hommes et les jeunes du Sénégal sont impliqués dans la production et la vente de niébé et de millet. Mon conseiller pédagogique pour cette étude est le Dr. Fridah Mubichi-Kut, du Département d'Economie Appliquée et de Gestion, et celui du Développement Global de l'université de Cornell. Cet effort fait partie du travail du laboratoire d'innovation pour l'amélioration des cultures financé par l'USAID et mis en œuvre par l'Université de Cornell avec le Centre d'Innovation en Afrique de l'Ouest (CIAO) sous l'égide de l'Institut Sénégalais de Recherches Agricoles (ISRA) à Dakar, au Sénégal.

L'objectif de cette recherche est de nous aider à comprendre les facteurs qui favorisent la participation des femmes, des hommes et des jeunes à la production et à la vente de niébé et de millet. Pour mieux comprendre votre pratique, je vous poserai diverses questions concernant les décisions prises pour acheter et planter certaines semences plutôt que d'autres. De même, je vous demanderai de décrire les défis auxquels vous êtes confrontés lors de l'achat ou de la vente de niébé et de mil. Votre participation à cet entretien est volontaire. Si vous choisissez de participer, vous pouvez refuser de répondre à certaines questions ou vous pouvez arrêter de participer à tout moment. Votre participation à cette étude ne comporte aucun risque ou désagrément prévisible, à l'exception du temps (environ 1 heure) que prendra l'entretien ou la discussion. Il n'y a pas d'avantages directs à participer à cette étude. Cependant, les informations obtenues contribueront à améliorer l'accès des agriculteurs à des semences de meilleure qualité, à l'information et au marché au Sénégal.

Il ne s'agit pas d'une évaluation et il n'y a pas de bonnes ou de mauvaises réponses. Les informations recueillies ici sont confidentielles et personne ne pourra vous identifier, vous ou votre ménage. Je vous demande de me soutenir en répondant aux questions aussi honnêtement et complètement que possible. Vos réponses ne seront pas identifiées comme provenant de vous, bien que vos commentaires puissent être rapportés comme provenant d'un jeune ou d'un adulte, homme ou femme, d'une localité (tel qu'un district). Les réponses que vous fournirez ne seront pas communiquées aux régulateurs ou à l'équipe d'accréditation.

Si vous avez d'autres questions après notre entretien d'aujourd'hui, vous pouvez me joindre par téléphone au +1 406-550-0812, votre chef local ou le bureau de l'ISRA (+221-33-859-1725). Si vous avez des questions ou des inquiétudes concernant vos droits en tant que sujet de cette étude, vous pouvez contacter le "Institutional Review Board (IRB) for Human Participants" à l'université de Cornell au +1 607-255-5138. Vous pouvez également faire part de vos préoccupations ou de vos plaintes de manière anonyme par l'intermédiaire de Ethicspoint en appelant le numéro gratuit 1-866-293-3077. Ethicspoint est une organisation indépendante qui assure la liaison entre l'université et la personne qui dépose la plainte afin de garantir l'anonymat.

Merci d'avoir pris le temps de participer à cette recherche!

Ce formulaire de consentement sera conservé par le chercheur pendant cinq ans après la fin de l'étude.

- |  |   |
|--|---|
| - Je comprends les informations ci-dessus<br>utilisation et j'accepte de participer à l'étude. | - J'autorise la prise de ma photo et son<br>dans le cadre de cette étude. |
| - Je n'y consens pas et souhaite quitter l'étude.  | - Je n'autorise pas la prise de ma photo.                                 |

## Appendix G: Field research assistant training outline (English)

### I- Introduction

#### Introduction of Calista and the ILCI project and CIWA

- Participants self introduction (name, what your studying, what you are looking forward to learning and contributing to this study, favorite thing to do)
- Objective of the training
- Brief presentation of my thesis

### II- Gender and agriculture

- Key concept definition: value chain, value chains actors, seed system, VBA
- Gender dimension framework (GDF) and its components
  - Definition of the key terms- Sex, gender, gender relation
  - Gender and value chain

### III- Sampling

	Fatick	Dirbouel	Kaolak	Kaffrine	Total
Producers			14= (8F+6M)	14= (8F+6M)	28
VBA	1	1	2= (f+m)	2= (f+m)	6
Traders/Agro	1	1			2
ISRA Staff	1	1	1	1	4
<b>Total</b>	<b>40</b>				

### IV- Data collection method

- Ethics & Confidentiality
- Why use interviews for data collection
  - Types of interviews used:
    - Individual (what are the key things you are looking for)
    - Group interview (what are the key things you are looking for & explore strategies you might use to ensure everyone's opinion is captured – one of the dangers of group interviews is you might have one person dominate the interviews, so you need to make sure you are giving everyone a chance to share their views)
- Strategies in note taking (e.g. identify who will be the main note taker and translator for group interviews. For example if interviewing women- the guy should be the note taker and lady your translator).



- Explore strategies/ techniques the team might use to make sure that they are consistently providing you timely information so you are able to probe and get valuable information.
- Project deliverables - My expectations for what the assistants need to provide me with at the end of each field interview and also at the end of the day.
  - All their notes
  - Audio files & Managing the audio from the interviews
  - End of the day debrief – they have to stay for this.

V- Interview simulation

- Presentation of the interview guide
- Interview practice
- Translation and back translation of interview questions and consent form (French-Wolof-French)
- Repeat this! What to do when they have to translate for me – how will that be managed? What are my expectations?