Gender Needs Assessment in Soroti District, Eastern Uganda For Agro-Ecological Management of the Fall Armyworm in Eastern and Southern Africa (EcoPM) Project

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Country: Uganda

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Executive summary

The International Centre of Insect Physiology and Ecology (icipe), in partnership with the National Agricultural Research Laboratories (NARL), Kawanda, is implementing the project titled "Agroecological Management of the Fall Armyworm in Eastern and Southern Africa (EcoPM)" in Uganda. Before rolling out the project interventions, the two institutions conducted a gender needs assessment study to ensure that all target groups within the farming communities are inclusively engaged and benefit equitably from the project's outcomes.

The assessment aimed to establish the roles of men and women in the maize value chain in eastern Uganda, examine gender dynamics in decision-making across production and marketing, determine the levels of awareness and understanding of Fall Armyworm (FAW) innovations among both men and women, and assess access to FAW control measures and technologies in the target areas.

The findings revealed persistent gender disparities in the maize value chain. Women are more involved in production activities but continue to have limited influence over key decisions related to resource use, marketing, and income, largely due to entrenched patriarchal norms. Although women contribute significantly to maize cultivation, many lack basic knowledge of pest and disease management, including FAW control techniques. The study also established that overall awareness of FAW management innovations is low, with most farmers unaware of push–pull technology, a sustainable and environmentally friendly approach to pest control. Nonetheless, farmers, particularly women, expressed keen interest in learning about the technology and sharing the knowledge with others.

Barriers to women's participation in capacity-building activities were also noted. Trainings are often held in distant locations and scheduled at times that coincide with women's household responsibilities, limiting their attendance and engagement. In addition, the dissemination of FAW control information relies heavily on face-to-face methods, which restricts wider reach and adoption of improved technologies.

To address these challenges, the study recommends deliberate efforts to transform gender norms that limit women's participation in decision-making and access to agricultural innovations. Strengthening agricultural extension services is essential to enhance awareness and adoption of FAW management technologies among all gender groups. Training sessions should be organized closer to the communities and scheduled at convenient times for women to enable active participation. Moreover, conducting separate training sessions for men and women, where appropriate, can promote open dialogue and generate more realistic feedback.

Overall, the findings underscore the need for a gender-responsive approach in the implementation of the EcoPM project to ensure equitable participation, improved knowledge dissemination, and enhanced adoption of sustainable FAW control measures across farming communities in eastern Uganda.

1. Introduction

Gender dynamics play a critical role in agricultural productivity and value-chain integration across sub-Saharan Africa. Studies show that empowering women in agriculture enhances maize productivity, linking gender equity to improved farm outcomes (Diiro et al., 2018). However, women's participation in decision-making over production, marketing, and resource allocation remains limited, reducing their capacity to benefit fully from agricultural innovations (Msofi Mgalamadzi et al., 2024). Concurrently, agroecological innovations such as the "push–pull" system have proven effective in controlling the Fall Armyworm (Spodoptera frugiperda), improving yields and promoting sustainable pest management (Midega et al., 2018).

In this context, the International Centre of Insect Physiology and Ecology (*icipe*) and the National Agricultural Research Laboratories (NARL), Kawanda, are implementing the Agroecological Management of the Fall Armyworm in Eastern and Southern Africa (EcoPM) project in Uganda. The project seeks to test and promote FAW management innovations in smallholder farming systems through a public–private–people partnership approach. Its goal is to ensure that both men and women have equitable access to FAW control technologies, engage jointly in decision-making, and benefit from improved productivity and income opportunities, thereby advancing gender-responsive and sustainable pest management in maize-based systems.

1.1 Understanding the Gender Capacity Gaps in Maize Production and Management of FAW and Outcomes.

Addressing the gender capacity gaps in maize production and management of fall army worm involves recognising the challenges that men and women face in maize production and fall army worm management. These could widely range from limited knowledge and skill sets, limited access to land and inputs, poor extension services, technology awareness and adoption and. Community/ household decision making.

Considering that one of the key factors contributing to the gender gap in agricultural productivity and significant harvest loss to the FAW is a lack of information and knowledge, it is therefore paramount that the strategy to addressing these gaps ensures that both men and women equally benefit from the FAW IPM innovations. The barriers to access to information such as developing gender-specific training materials, setting up women-led demonstration fields and training following women's needs (time, transport, household support, methodology), and policies that promote gender equality in agricultural extension services should be highly considered. In addition, it is critical that we shift intra-household decision-making towards greater gender balance by promoting female role models and engage men in training that demonstrates the benefits of closing the gender gap in agricultural productivity

It is envisaged that timely information, trainings and communication particularly for women guarantees their equal access to knowledge and trainings on FAW IPM innovations and provides measures that ensure both women and men can implement this knowledge to their and their families' benefit.

1.2 Objectives

The objectives of the gender needs assessment assignment were to:

1. Establish the roles of men and women in the maize value chain in eastern Uganda.
2. Assess the current dynamics of decision-making in agricultural production, and marketing focusing on the involvement of both men and women in eastern Uganda.
3. Determine the existing levels of awareness and understanding among both men and women regarding Fall Armyworm (FAW) innovations.
4. Assess the accessibility of FAW control measures and innovations for both men and women in the targeted agricultural communities.

2. Methodology

The gender needs assessment was conducted in Soroti District, eastern Uganda, in July 2023. Four sub-counties, Asuret, Atek, Onongo, and Palaet, were purposively selected based on the prevalence of Fall Armyworm (FAW) infestation and their engagement in maize production. Within each sub-county, men and women farmers representing both youth and older age groups were purposively sampled for participation. To ensure adequate community representation, respondents were selected at the village level, with one to two men and women identified per village.

Data were collected through sex- and age-disaggregated focus group discussions (FGDs) aimed at exploring gender roles and decision-making in maize production and pest management. The discussions focused on gender dynamics within maize production, division of labour along the maize value chain, decision-making in production and marketing, awareness and understanding of FAW innovations, accessibility of FAW control measures and technologies, and the channels used for technology adoption and knowledge sharing.

A total of sixteen FGDs were conducted, disaggregated into four categories: men above 35 years, women above 35 years, men below 35 years, and women below 35 years. Each group comprised 8–12 participants. All sessions were conducted in the local language, audio-recorded with participants' consent, and later transcribed. Data were organized and coded using ATLAS.ti Version 23, and a thematic analysis approach was applied to identify emerging patterns and insights.

Ethical considerations were strictly observed. Informed consent was obtained from all participants, and their privacy and confidentiality were assured prior to any recording or photography.

3. Results

3.1 Gender dynamics in the maize value chain

This subsection presents findings on the division of labour and decision-making dynamics in maize production and marketing within the study communities. The results indicate that both elderly men and women are actively engaged in maize production, though perceptions about who contributes most to the work differ across gender and age groups. While participants across all focus group discussions (FGDs) acknowledged that maize farming is a shared activity between men and women, opinions remained divided on the extent of each group's involvement.

Male participants, particularly among the youth, tended to emphasize men's greater role in production, citing responsibilities such as land preparation, ploughing, and marketing. As one male youth participant noted, "*It is the men doing most of the work because you have to plan for the maize, clear land, plough, and now threshing and marketing is on you. It is the man because he is the one deciding everything concerning the garden and supervision*." However, other respondents challenged this view, highlighting that women perform a significant share of farm labour, especially in weeding, harvesting, and post-harvest handling. As an elderly male participant observed, **"Both men and women engage in maize production in this community."**

Interestingly, women's contributions were more visible in the daily management of farms, while men were more involved in activities that required physical strength or involved financial transactions. A youth participant humorously remarked, *"Women do most of the work because they are always at home, while the men are chilling at the centres."*

Despite variations in perception, most FGDs agreed that men dominate the marketing stage of the maize value chain due to their higher bargaining power and control over income from sales. This reflects persistent gender norms that position men as decision-makers and primary controllers of productive and financial resources.).

3.1.1 Division of Labour within the Maize Value Chain

Discussions with farmers revealed that maize-related activities can broadly be categorized into production, post-harvest handling, processing, and marketing" (Table 1). Across all gender groups, participants identified typical production activities as land clearing, seed purchase, planting, spraying, weeding, and harvesting. Women's focus group discussions (FGDs) additionally emphasized that men often take on the role of monitoring the gardens—ensuring that fields remain weed-free and safeguarding mature maize against theft.

The findings further highlight notable gender disparities along the maize value chain, particularly in marketing and income utilization. While both men and women contribute to production, marketing activities remain largely dominated by men, who are perceived to have greater control over sales and financial decision-making. As one women's FGD participant below 35 years in Soroti explained: "*When it comes to marketing, our husbands are very active. They pack the dry maize in sacks and take them to the market. Sometimes they sell from home to traders. But when they sell, they bring the money, and we plan.*"

Such patterns are consistent with empirical evidence showing that male-headed or male-decision-making households are more likely to access higher-value marketing channels than female or joint-decision-making households, where women's control over marketing and income is more restricted (Gebre et al., 2019).

Table 1: Gender division of labour in the maize value chain by men and women of different age groups

	Responsible person							
Theme and Activity	**Above 35 years**				**Below 35 years**			
	Men FGD		**Women FGD**		**Men FGD**		**Women FGD**	
	Man	**Woman**	**Man**	**Woman**	**Man**	**Woman**	**Man**	**Woman**
Production related activities								
Clearing land	֍		֍		֍		֍	֍
Ploughing	֍֍		֍		֍		֍	
Planting	֍	֍	֍	֍	֍	֍	֍	֍
Seed purchase	֍				֍			
Spraying	֍	֍	֍		֍		֍	
Weeding			֍	֍	֍	֍	֍	֍
Fertiliser application								֍
Monitoring of crops			֍	֍			֍	֍
Harvest, post-harvest, and processing activities								
Harvesting	֍	֍	֍		֍	֍	֍	֍
Drying		֍	֍	֍	֍	֍	֍	֍
Threshing			֍	֍	֍	֍	֍	֍
Winnowing	֍		֍				֍	
Packaging			֍				֍	
Storage		֍	֍	֍	֍	֍	֍	֍
Processing (milling)			֍	֍				
Marketing								

Loading of maize								
Transportation								
Selling	✓		✓		✓		✓	

3.1.2 Decision-making across the maize value chain by men and women

Findings from the study reveal notable gender-based disparities in decision-making along the maize value chain (Table 2). Although both men and women actively participate in production, certain activities and decisions remain gender specific. Men were consistently identified as the primary decision-makers in both production and marketing, particularly regarding income and its use.

The study further indicates that gender roles in decision-making are influenced more by entrenched stereotypes than by formal social norms. Community perceptions often discourage men from engaging in tasks deemed "women's work," as such behavior is interpreted as a sign of weakness or loss of authority. As one female participant below 35 years explained: "*In this village, when a man is seen doing a woman's work, people will start saying your wife bewitched you. So, most men in this village fear that.*"

These social perceptions reinforce male dominance in agricultural decision-making, limiting women's agency despite their significant labour contributions across the maize value chain. Such findings align with broader research indicating that in many African farming systems, patriarchal norms restrict women's participation in key production and marketing decisions, even when they contribute substantially to farm labour (Doss & Meinzen-Dick, 2020).

Table 2: Decision-making in the maize value chain by men and women of different age groups

	Responsible person							
Theme and Activity	**Above 35 years**				**Below 35 years**			
	Men FGD		**Women FGD**		**Men FGD**		**Women FGD**	
	Man	**Woman**	**Man**	**Woman**	**Man**	**Woman**	**Man**	**Woman**
Production related Decisions								
Land accessibility								
Method of land acquisition					✓	✓		
Where to plant								
Crop variety/seed type					✓			
Source of seed					✓			
Use of agrochemicals (pesticides)	✓		✓					
When to plant	✓	✓	✓	✓	✓	✓	✓	✓
Weed management	✓							
Harvest, post-harvest, and processing activities								
Harvesting time and form								
Marketing and use of income								

Selling/ not		✇						✇
Amount to sell	✇						✇	
When to sell								
Who to sell								
Selling price								
Use of income	✇✇	✇	✇✇	✇	✇	✇		

Although there was general consensus that women should not make major financial decisions, respondents agreed that women could do so in specific circumstances, particularly when decisions concern household health, nutrition, and other basic needs, or when the man is absent or unable to participate (Fig 1).

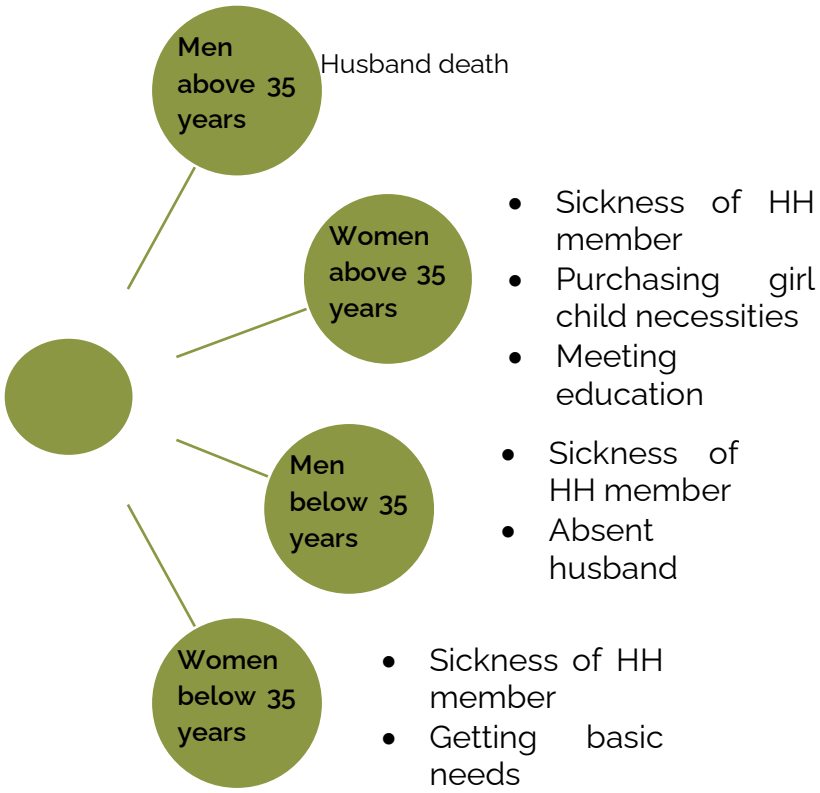

Figure 1: Conditions under which women may make decisions in the household

3.2 Maize pests' awareness, and management

3.2.1 Levels of awareness and understanding among both men and women regarding Fall Armyworm (FAW) innovations.

Since its first appearance around 2017, the Fall Armyworm (FAW) has emerged as one of the most economically significant pests in the district, causing severe losses in household maize production. Focus group discussions (FGDs) revealed that FAW infestation has substantially increased production costs, as farmers are compelled to use pesticides that are often unaffordable given the low market prices for maize.

Using identification charts during the FGDs, it was evident that while some respondents, mostly men, could recognize the pest, many women had limited knowledge about FAW and its distinguishing features. As one female participant admitted, "We don't know how to differentiate."

Households reported adopting a range of management strategies to combat FAW, including the use of inorganic pesticides, organic remedies, and physical control methods (Table 3). Participants noted an increased reliance on chemical products—some of which are non-recommended or locally improvised, such as detergents—raising concerns about their effectiveness, potential health risks, and environmental impacts. The use of unauthorized substances also threatens maize quality and consumer safety. Physical control methods, such as hand-picking and crushing larvae, were described as labour-intensive and impractical for larger farms, highlighting the urgent need for more accessible, safe, and sustainable FAW management options.

Table 3: Methods of Control of FAW by farmers in Soroti district

Theme	Method	Men Above 35 Years	Women Above 35 years	Men Below 35 years	Women Below 35 years
Inorganic methods	Pesticides (Rocket)		✓	✓	✓
	Detergents (powder)	✓	✓		✓
Organic methods	Plant and animal wastes				
	Use of ash	✓	✓		✓
	Use of pepper	✓			
	Use of urine	✓	✓	✓	✓
Physical	Hand-picking	✓			

In terms of knowledge of the push and pull technology, farmers lacked awareness of this technology throughout all the FGDs. The observed willingness of all FGD participants to share information with others underscores the room for expansion of the push and pull technology in the area. Further, from all the FGDs, participants showed the urge to receive training that speaks to the management of fall armyworm

3.2.2 Management of pests and diseases

Our study revealed that while there is limited use of pesticides some farmers especially women reported that they implore no single management method in addressing pests and diseases (Table 4). The men's focus group discussions show that men knew and used some inorganic methods including pesticides such as rocket, and organic methods. This study also revealed that farmers are using petroleum products such as kerosene to manage pests and diseases which should be a concern for health and the environment in general.

Table 4: Pest and disease management practices

Theme	Specific method	Men Above 35 Years	Women Above 35 years	Men Below 35 years	Women Below 35 years
Do nothing about it	Just leave/ do nothing/ won't do anything		✓	✓	✓
Agronomic practices	Crop rotation			✓	
	Early planting			✓	
Organic methods	Use of red pepper	✓	✓		
Inorganic methods	Paraffin			✓	
	Rocket		✓		
	Powder detergent	✓	✓	✓	✓
	Spraying			✓	

3.3 Accessibility of FAW control measures and innovations for both men and women in the targeted agricultural communities.

Two key themes emerged under this subsection,

(i) *Access to training and technologies*, and
(ii) *Knowledge-sharing information channels accessed by farmers in the targeted project areas.*

3.3.1 Access to training on maize production and training needs

Table 5 summarizes the training needs identified by different FGD groups. Overall, farmers reported limited access to training, which partly explains their low awareness of FAW management. Women, especially older ones, were found to be more disadvantaged in accessing agricultural knowledge.

Across all groups, farmers expressed strong interest in training on pest and disease management, crop planting, fertilizer application, and post-harvest handling. Younger farmers emphasized soil fertility management, while women highlighted the need for market linkages and post-harvest practices. Men above 35 years also noted the importance of training on decision-making within households.

Table 5: Training needs of farmers as reported by men and women of different age groups

Theme	Training needs	Men Above 35 Years	Women Above 35 years	Men Below 35 years	Women Below 35 years
Agronomic practices	Soil Fertility management			✓	✓
	How to plant	✓	✓	✓	
	How to apply fertilizer		✓		✓
	Pest and disease management	✓	✓	✓	✓
	When to plant	✓			
Harvest and post-harvest handling	Post-harvest handling		✓	✓	
Marketing	Connection to markets		✓		
Interrelations	How to make decisions	✓			

Participants recommended improving extension delivery by making training more inclusive and accessible to women, through better timing, location, and participatory approaches, to enhance adoption of sustainable maize and FAW management practice (Table 6). Other areas of training improvement are outlined in Table 6. In addition to improving training location, delivery, and frequency,

Table 6: Desired Training Changes reported by men and women of different age groups

Theme	Training needs	Men Above 35 Years	Women Above 35 years	Men Below 35 years	Women Below 35 years
Training related improvement					
Training Location	Bring training near/ local community	✓			
Training Delivery	Accompany training with agro inputs		✓		
	Use practical and demonstrations during training	✓	✓		
	Language	✓			

	Address the language barrier by using the local language during training				
	Training time/ length/ hours/ shorten	✓			✓
Training frequency	Increased frequency of extension visitation		✓		
Training mode	Men and Women should be trained separately		✓		
Mobilisation					
Sensitize about training	Sensitize about training			✓	✓
Time management	Trainers keeping time	✓			
Female mobilizer	Introducing/ having a female mobilizer for visitation		✓		
Social support					
Spouse support	Men should permit wives		✓		
	Men should provide transport for their wives		✓		
Collegial support	Encouragement of others to also attend	✓			
Intra household relationships	Relationships and trust for spouse			✓	

3.3.2 Technology use and information sharing channels

Discussions with focus group participants revealed limited exposure to agricultural technologies among farmers. Many respondents indicated that practices such as row planting, fertilizer application, and the use of mobile phones for agricultural information were relatively new to them. This limited exposure has likely hindered the adoption and effective use of modern technologies in maize production.

The most common channels for accessing agricultural information were face-to-face interactions through local leaders, radio programs, and community gatherings such as churches. However, women's access to these channels remains restricted compared to men's, largely due to gendered control over household resources such as radios and mobile phones. As one young female participant in Soroti noted, *"Much as some of us have radios in our homes, they are mostly controlled by our husbands. You may be listening to a station, but when he returns, he changes it—and that's the end of it."*

This imbalance highlights the need for inclusive communication strategies that ensure both men and women have equitable access to agricultural information and technologies, thereby enhancing overall productivity and resilience in maize farming communities.)

3.3.3 Access to extension services and training centres

Across all focus group discussions, participants consistently identified limited access to agricultural extension services as a major challenge affecting maize production. Most farmers reported that their primary source of agricultural knowledge remains informal farmer-to-farmer exchanges, often based on personal experience rather than formal training. Many participants revealed that they had never received any structured agricultural training in their villages, nor had they ever interacted directly with extension workers.

This lack of access to extension support has significant implications for technology adoption, pest management, and productivity. Without reliable access to expert guidance, farmers often rely on trial-and-error approaches, which can lead to ineffective or unsafe practices—particularly in pest control and soil management. Women, in particular, were noted to be more disadvantaged due to social and mobility constraints that limit their participation in community meetings or training sessions.

These findings mirror broader regional evidence showing that weak extension systems and gender disparities in access to agricultural advice continue to constrain smallholder productivity and resilience in sub-Saharan Africa (Ragasa et al., 2016; Katungi & Akankwasa, 2010). Strengthening farmer linkages with extension agents, establishing accessible training centres, and integrating gender-sensitive outreach approaches could substantially enhance both knowledge transfer and sustainable maize production practices.

4. Conclusion and recommendations

4.1 Conclusion

The study revealed persistent gender disparities within the maize value chain, where women are predominantly engaged in production activities yet have limited decision-making power. This imbalance is reinforced by entrenched patriarchal norms that privilege men in household and community-level decision-making processes. Despite their active role in maize production, women often lack access to essential knowledge and skills on pest and disease management, leaving them disadvantaged in addressing productivity constraints such as the FAW.

Awareness of FAW management practices remains generally low across the study communities. While farmers use a mix of organic and inorganic control methods, these approaches are often ineffective or unsafe. Knowledge of sustainable agroecological innovations, such as the PPT, Was almost non-existent among participants. Nevertheless, farmers, particularly women, expressed strong interest in learning and disseminating such practices within their communities.

Access barriers to extension and training services remain a critical challenge. Many women reported that training sessions are conducted far from their homes and at times that conflict with domestic responsibilities, limiting their participation. Moreover, information dissemination still relies heavily on face-to-face methods, with limited integration of digital or mass media platforms.

Overall, the findings highlight the need for gender-responsive capacity-building strategies that enhance women's access to agricultural training, technologies, and decision-making spaces, thereby promoting equitable participation and sustainable pest management within the maize value chain.

4.2 Recommendations

Based on the study findings and conclusions, the following recommendations are proposed to promote gender equity and enhance the effective adoption of Fall Armyworm (FAW) management technologies within the maize value chain.

1) Address gender norms and power dynamics:

Implement gender-transformative approaches that challenge and gradually shift restrictive social and cultural norms limiting women's decision-making power in agriculture. Community sensitization and capacity-building programs should target both men and women to promote joint decision-making and equitable participation across the maize value chain.

2) Strengthen extension and advisory services:

Enhance the capacity and reach of extension services to ensure equitable access to information and training on Fall Armyworm (FAW) management and other sustainable agricultural practices. This should include recruiting and training more female extension workers to facilitate gender-inclusive learning environments.

3) Promote equitable access to training opportunities:

Organize agricultural trainings within proximity to farmers' homes and schedule them at times convenient for women, especially those with household responsibilities. Trainings should also provide safe and inclusive spaces, such as separate sessions for men and women where necessary, to encourage open dialogue and realistic feedback.

4) Enhance awareness and adoption of sustainable technologies:

Increase farmer awareness of proven agroecological innovations, such as the push–pull technology, through demonstrations, farmer field schools, and local champions. Ensure that both men and women have equal access to these learning opportunities and the necessary inputs.

5) Leverage diverse communication and learning channels:

Use multiple information-sharing platforms, including radio, community gatherings, and digital tools, to disseminate agricultural knowledge. Efforts should also be made to ensure that women have access to these channels at household and community levels.

6) Foster inclusive partnerships:

Strengthen collaboration among research institutions, government agencies, NGOs, and private sector actors to design and scale gender-responsive FAW management strategies that reflect the unique needs and capacities of different farmer groups.

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