Gender Needs Assessment Report

For Agro-Ecological Management of the Fall Armyworm in Eastern and Southern Africa Project in Zambia

Title of the project	EcoPM: Agro-Ecological Management of the Fall Armyworm in Eastern and Southern Africa Project
Country	Zambia
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Date	January, 2024

icipe The TROpical Insect Science Institute

ZARI Zambia Agriculture Research Institute

german cooperation DEUTSCHE ZUSAMMENARBEIT

Implemented by giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Acronyms

CAADP	Comprehensive Africa Agriculture Development Programme
CAC	Camp Agriculture Committee
CBO	Community Based Organisation
CEO	Camp Extension Officer
CGA	Country Gender Assessment
GII	Gender Inequality Index
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GRZ	Government Republic of Zambia
FAO	Food and Agriculture Organisation
FAW	Fall Army Worm
FSS	Farmer Field Schools
GRZ	Government of the Republic of Zambia
icipe	International Centre of Insect Physiology and Ecology
IFAD	International Fund of Agricultural Development
IPM	Integrated Pest Management
JICA	Japan International Cooperation Agency
MCDCW	Ministry of Community Development and Child Welfare
MCTI	Ministry of Commerce, Trade and Industry
MDG	Millennium Development Goals
MOA	Ministry of Agriculture
NAIP	National Agriculture Investment Plan
NARES	National Agricultural Research and Extension organizations
NGO	Non – Governmental Organisation
PMP	Pest Management Plan
POP	Persistence Organic Polluants
PPT	Push and Push Technology
SDG	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change
ZARI	Zambia Agriculture Research Institute
ZATP	Zambia Agribusiness and Trade Project Pest Management Plan

Executive Summary

The fall armyworm (FAW) invasion in Africa poses a significant threat to maize production, impacting millions of smallholder farmers. In response, the International Centre of Insect Physiology and Ecology (*icipe*), in partnership with the private sector and national agricultural organizations in Uganda, Zambia and Malawi, has developed climate-smart, gender-responsive approaches to pest management. This project aims to test and demonstrate these innovative solutions within smallholder farming systems and scale up effective practices through inclusive dissemination methods in East and Southern Africa.

A gender needs assessment was conducted in two districts of Zambia's Eastern Province to explore gender dynamics related to training, access to digital information, pest management, decision-making in maize production, and access to resources such as land. The assessment sought to identify gender-specific constraints and opportunities, providing actionable recommendations.

Findings show distinct roles and responsibilities for men and women in maize production, marketing, income generation, and decision-making, with women facing limited access to resources, training, and information.

Maize production faces numerous challenges, including limited fertilizer availability, unpredictable rainfall patterns, FAW infestations, high hybrid seed costs, insufficient training, delayed market openings, labor shortages, drought, limited farm equipment, delayed government payments, lack of oxen, poor transport infrastructure, and inadequate pest control training. These issues affect both men and women, though the impact on women is often compounded by existing social and economic inequalities.

Based on these findings, key recommendations include increasing women's access to and control over resources, promoting gender-equitable norms and practices, and strengthening women's participation in agricultural training—supported by demonstration plots and Farmer Field Schools (FFS) located for easy access. The project also recommends tailoring information delivery through radio and mobile platforms and scaling up empowerment initiatives to enhance women's decision-making roles. Identifying and addressing specific gender-related training needs in maize production and integrated pest management (IPM) is essential.

The assessment underscores that women are disadvantaged in accessing agricultural training and on-farm demonstrations, with men generally having greater knowledge and information access. Socio-cultural norms continue to limit women's capacity to respond effectively to climate change and pest-related challenges, despite their vital role in household food security. Given the growing threat of FAW exacerbated by climate change, adopting gender-responsive IPM strategies is critical to support women farmers and safeguard maize production.

1. Introduction

1.1 Background

In Zambia, the agriculture sector is one of the largest sources of employment for men, women, and youth. This sector is primarily dominated by smallholder farmers who cultivate less than 2 hectares of maize. These farmers continue to rely on traditional, rain-fed crop production methods, which are vulnerable to climatic risks such as late onset of the rainy season, droughts, dry spells, and excess rainfall. In recent years, high levels of disease and pest infestation, often linked to poor crop management practices, have further challenged farmers. These risks threaten crop yield and reduce productivity.

To address the increasing threats posed by these climatic risks and pests, Integrated Pest Management (IPM) has emerged as an important strategy to help smallholder farmers mitigate crop losses. IPM also aims to raise farmer awareness and build resilience against unstable and unpredictable agro-climatic conditions.

The primary aim of this assessment is to investigate the specific needs of women and men regarding training, access to digital information, and resources. The analysis will ensure that the implementation strategy is gender-sensitive and that a comprehensive Monitoring and Evaluation (M&E) system is established in all intervention areas within the districts where the project is being implemented. This report outlines the technical approach used for the analysis, along with its findings and recommendations for the project.

The EcoPM project aims to improve agro-ecological management of the fall armyworm in Eastern and Southern Africa by fostering collaboration among maize growers, innovation producers, and facilitators like policymakers. Utilizing open-access platforms, the project will raise awareness, connect smallholder farmers to innovations, target disadvantaged groups (including women and youth), and gather feedback from end-users. Sustainability will be achieved through capacity building for all stakeholders involved in research and innovation implementation.

The gender analysis is intended to inform the planning, design, and implementation of the proposed project areas, ensuring a gender-sensitive implementation strategy and effective M&E systems in all intervention areas within the provinces and specified districts.

1.2 Objectives

The objectives of this report are twofold:

i) To analyze gender issues in maize production and marketing in two target districts of the project. This includes examining access to training and identifying training needs, as well as exploring constraints in production and decision-making related to income. Additionally, the report will assess women's participation in maize marketing.

ii) To provide recommendations for integrating gender considerations by enhancing the participation of both men and women in the implementation of the EcoPM project. The goal is to increase the benefits of maize production for women, men, and their families.

The findings and recommendations are intended to be incorporated at every stage of project planning, implementation, monitoring, and evaluation.

2. Methodology

2.1 Study area and sampling design

The report utilized qualitative data collected through Focus Group Discussions (FGDs) conducted in two districts of the Eastern Province: Chipata and Petauke. The EcoPM project selected these districts due to their high maize production. In each district, four camps were randomly chosen: Appollo, Chisitu, Dilika, and Kajala in Chipata District, and Lusinde, Manyane, Minga, and Mthumpa in Petauke District. Gender data was collected and analyzed to assess the experiences of men and women regarding: (i) maize and livestock production systems, (ii) constraints in maize production such as fall armyworm and stemborers, and (iii) the roles of men and women in maize production and marketing. In each camp, four gender and age-disaggregated FGDs were conducted, categorized as follows: (1) women over 35 years, (2) men over 35 years, (3) women under 35 years, and (4) men under 35 years. Each district hosted 16 FGDs, resulting in a total of 32 FGDs across both

districts. Additionally, a baseline survey was implemented in selected camps in Petauke and Chipata.

2.2 Expected uses of the results

Fall Armyworm (FAW) is the limited access to information and knowledge. The current gender strategy under the *Agro-ecological Management of the Fall Armyworm in Eastern and Southern Africa (AgEco IPM)* project (icipe, 2023) ensures that women equally benefit from FAW IPM innovations. It aims to address barriers to information access by developing gender-responsive training materials, establishing women-led demonstration fields, and designing training tailored to women's needs—including time, mobility, and household responsibilities. The strategy also promotes policies that advance gender equality in agricultural extension services and encourages balanced intra-household decision-making by showcasing female role models and engaging men to appreciate the benefits of closing the gender gap in agricultural productivity.

(i) The results of this analysis are expected to support the project in several ways:
(ii) identify and understand gender issues in the project sites related to maize and livestock production.
(iii) Provide insights into maize production constraints, including FAW, stemborer, and other pests and diseases.
(iv) Clarify the roles of men and women in maize production and marketing.
(v) Guide the targeting of activities to men, women, and households by type (male-/female-headed and male-/female-managed).
(vi) Inform the development of strategies to enhance women's and female-headed households' participation in maize production, marketing, and project activities.
(vii) Support the design of interventions with the greatest impact across different groups, including women and female-headed households.

3. Results and discussions

3.1 General Household Characteristics

The general household characteristics of the sampled survey respondents are discussed in this section. The selection of the respondents ensured representation of different villages.

3.1.1 Distribution of household sizes by village

Figure 1 shows the average number of households residing in the villages that were represented in the FGDs, with Dilika and Mthumpa camps recording higher average in Chipata and Petauke, respectively, compared to the other villages. The assessment of household numbers was a critical step for the EcoPM project planning, to facilitate effective targeting, promote efficiency and inclusivity, and enable accurate measurement of project impacts, thereby contributing to improved community outcomes and sustainable implementation.

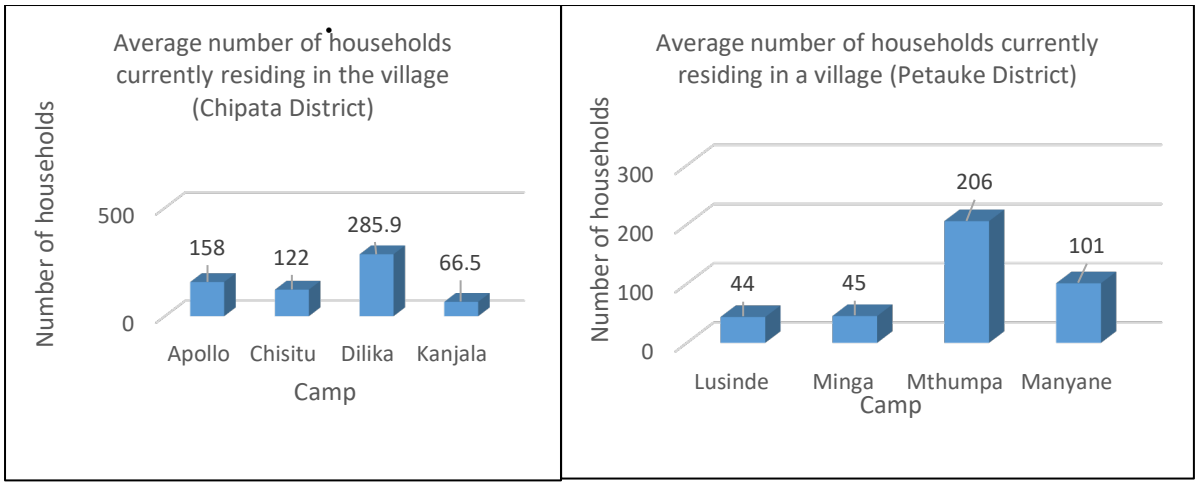

Figure 1: Average number of households currently residing in a village in Chipata and Petauke districts

Figures 2 shows the proportion of the female-headed households in each village represented from the two districts. Chipata had a higher percentage on average of female-headed households compared to Petauke, suggesting diversity in gender dynamics between these two districts. Assessing the number of female-headed households for the EcoPM project is critical because these households often face distinct resource constraints, such as smaller landholdings, less access to credit, and limited extension services compared to male-headed households (Gebre et al. 2021). These constraints may limit their participation in the project and hence the distribution of intended project benefits. Quantifying the female-headed households, the project can better target interventions, monitor equity in benefits, and develop gender-sensitive strategies that ensure these often-marginalised groups are not left behind.

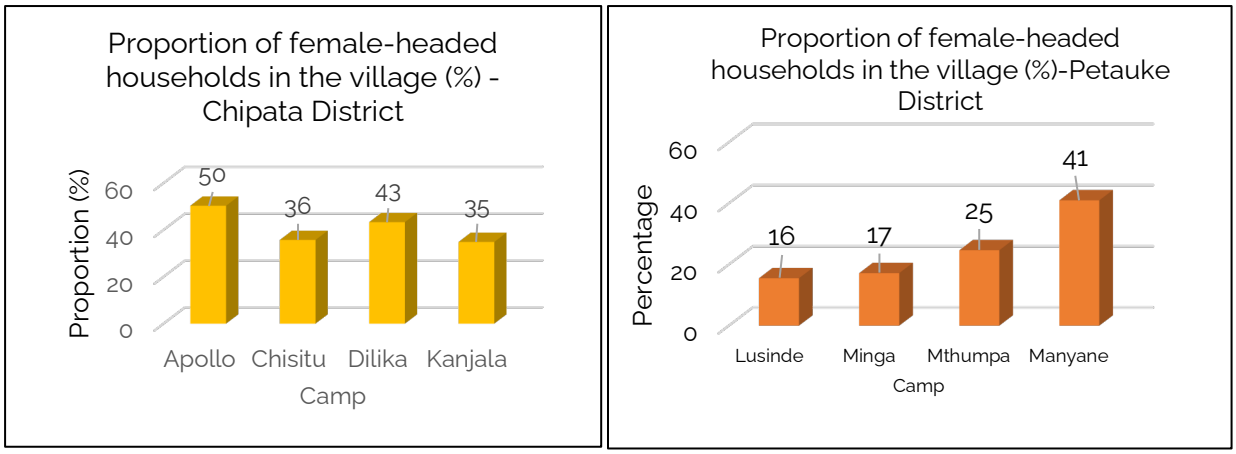

***Figure 2*: Proportion of female-headed households in a village in Chipata and Petauke**

3.1.2 Distribution of arable land and maize production across villages

Farming is the major economic activity in the majority of rural areas, including the two target districts. Figure 3 shows the average size of arable land (acres) owned by each household residing in the village. Farmers from Chipata district seem to have a lower average size of arable land compared to Petauke, probably because of the higher population density in the former compared to the latter district.

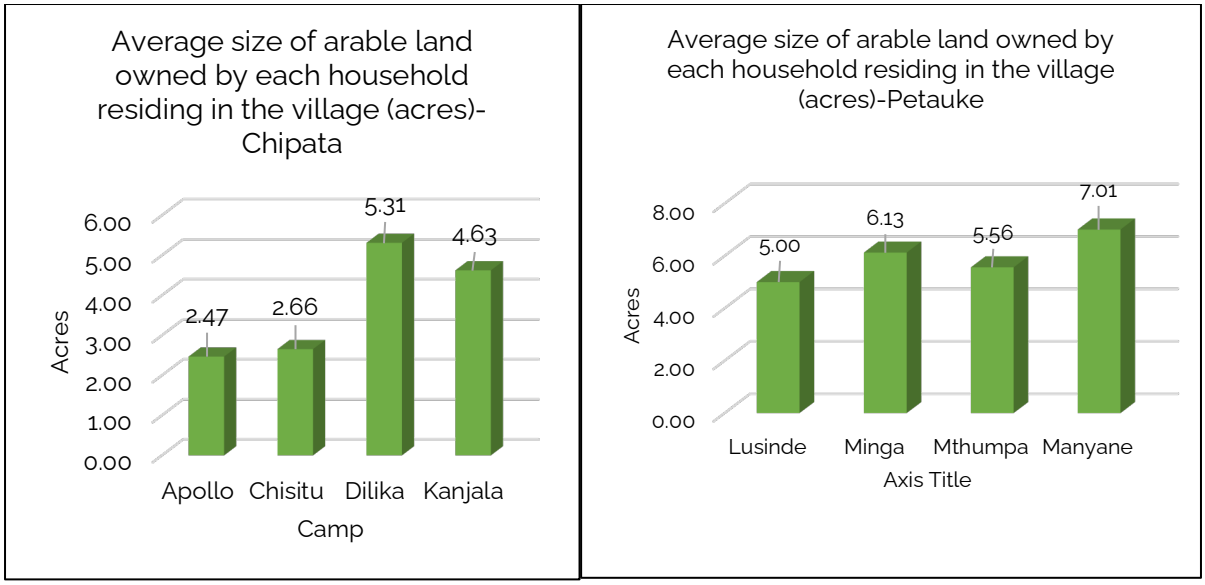

Figure 3: Average size of arable land owned by each household residing in the village in Chipata and Petauke districts

The EcoPM project aims at reducing the FAW challenge among maize-growing households. In Zambia, smallholder maize farmers dominate the agricultural sector, playing a critical role in ensuring food security, creating employment, and fostering rural development (Malesu et al., 2025). Figure 4 shows the importance of maize farming in our project sites, with over 50% of the arable land occupied by maize production across all the villages in both districts.

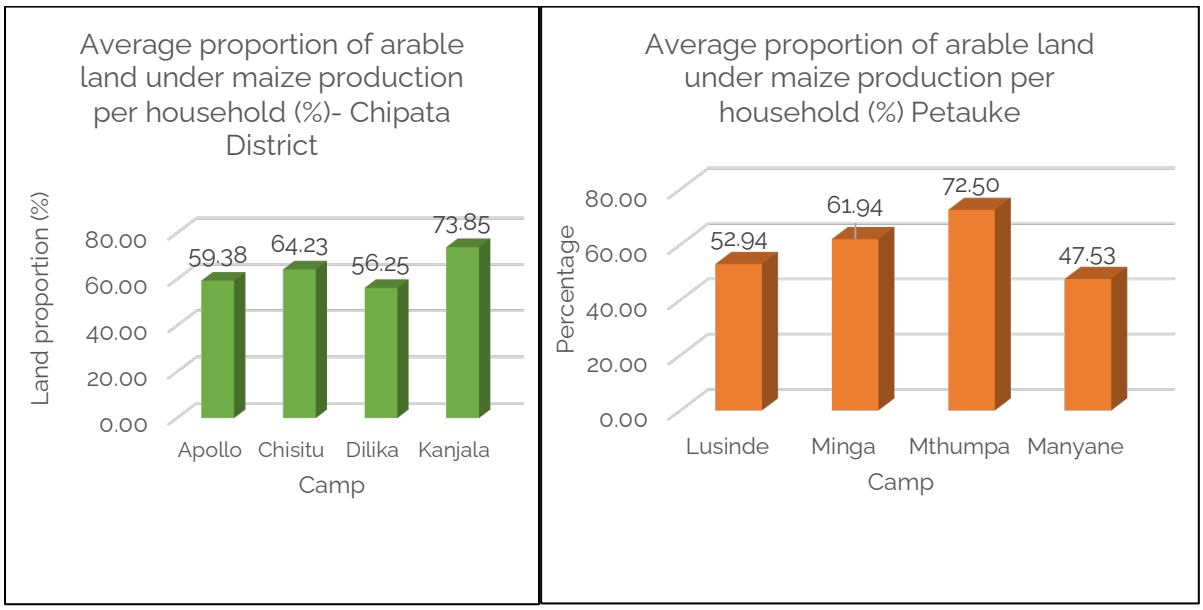

Figure 4: Average proportion of arable land under maize production per household in Chipata and Petauke districts

The EcoPM project aims to utilize irrigation to promote continuous maize production in the target areas. We assessed the number of maize growers using irrigation water within the study area. Figure 5 illustrates the proportion of maize-producing households utilizing irrigation water in the target villages. The results indicate that only a small percentage of farmers use irrigation water in both districts, with averages of 12% in Chipata and 9% in Petauke. These findings align with Malesu et al. (2025), who noted that most smallholder maize producers in Zambia face challenges related to limited irrigation infrastructure, primarily due to the high costs associated with installation and maintenance.

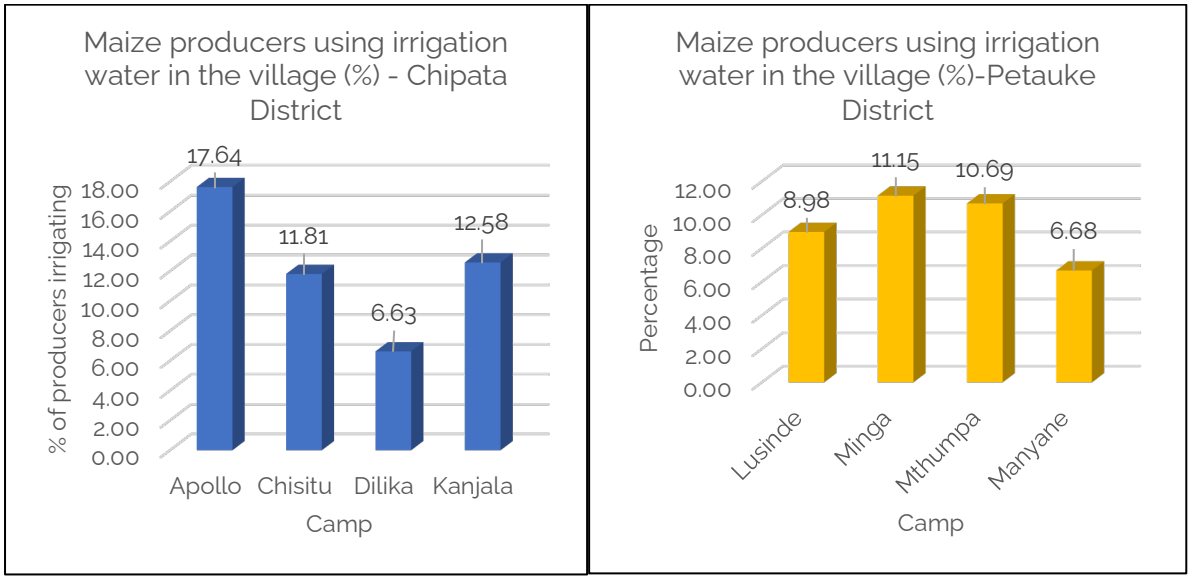

Figure 5: Maize producers using irrigation water in the village in Chipata and Petauke districts

3.1.3 Maize production

Maize production in the surveyed villages has declined over the past five years, with drought, soil fertility decline, and insect pests identified as the main constraints. Among these, Fall Armyworm (FAW) infestation is the most destructive, affecting over 50% of households. Farmers are well aware of the damage caused by FAW and employ a variety of control methods, including: -

- Chemical/Pesticide application
- Hand-picking
- Ash application
- Soil/sand application
- Homemade spray using water paste (soap)
- Spraying using local tree leaves like grecidia, chilli, and neem
- Application of Urea fertilizer
- Application of Soda (the one used for cooking
- Spraying using salty water
- Early planting and crop rotation

Despite these efforts, FAW infestation levels have remained relatively constant. Maize is grown primarily to meet household food needs, with many households selling about half of their harvest to cover essential expenses such as school fees, healthcare, and farming inputs. The remaining maize is kept for domestic consumption to ensure food security throughout the year, while some households retain most of their produce and sell only small amounts when extra cash is needed.

3.1.4 Access to agricultural information through radio and mobile services

The EcoPM project aims to use diverse channels to enhance awareness of Integrated Pest Management (IPM) innovations for Fall Armyworm (FAW) control. One of the main approaches for information dissemination is through digital tools, including radio programs and mobile phone services. Our study, therefore, assessed the number of farmers who have access to agricultural information through these channels. As shown in Figure 6, the majority of farmers in both districts had previously received agricultural information via radio, while only a few had received such information through mobile phone services. This suggests that radio could be an efficient mode of creating awareness of IPM innovation among farmers in Zambia.

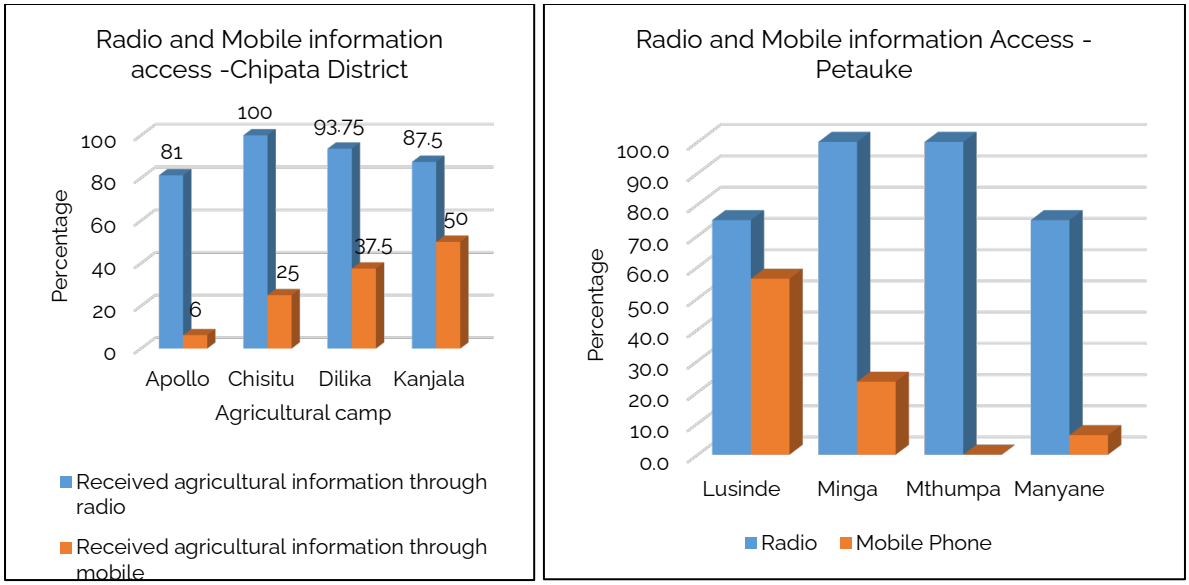

Figure 6: Radio and Mobile information access Chipata and Petauke

3.2 Gender Dynamics in maize production, marketing, and income

3.2.1 Sources of livelihood

Farming—both crop and livestock production—remains the primary source of livelihood for most households. However, many households also engage in a range of supplementary income-generating activities to support their needs. These include:

- Gardening of vegetables such as cabbage, rape, tomatoes, green vegetables, and fresh maize
- Charcoal burning and selling
- Small-scale trading, including the buying and selling of food items (e.g., soya chunks, kapenta) and clothing
- Participation in village banking and savings groups, where members pool resources and later share funds to invest in major household assets or purchase agricultural inputs such as seeds and fertilizers
- Transport services using vehicles, motorcycles, or bicycles
- Operation of small grocery shops within the villages
- Brewing and selling of local beer
- Carpentry and bricklaying

Limited access to arable land has prompted some households to diversify into these alternative income sources. In times of financial need, many farmers also sell livestock to meet essential expenses such as school fees or medical costs.

It is important to note that women are particularly active in village banking and savings groups, highlighting their significant role in household financial management and community-based economic activities.

3.2.2 Gender roles and decision-making related to maize production

At the household level, decision-making around maize production and income is largely joint, with husbands and wives consulting each other on what to sell and how to use the proceeds. Maize income is generally regarded as family income, and both spouses participate in planning agricultural activities for the maize season. However, in most cases, husbands have the final say during the implementation stage. Before selling, couples usually agree on the number of bags to set aside for household consumption and food security, and either spouse may handle the sale and receive the income.

The situation differs when spouses earn separate incomes. In such cases, income is often not shared openly. Many respondents noted that spouses tend to conceal part or all of their earnings, as they believe it reflects their individual effort and thus does not need to be disclosed. Even when income is shared, only a small portion is usually revealed. This lack of transparency is often attributed to limited trust, disagreements over spending priorities, or concerns about how the money will be used.

Some men reported withholding part of their earnings before disclosing the total to their wives, while some women admitted to concealing income to assist their own family members without their husbands' approval. Others said they prefer to save the hidden funds as emergency or "backup" money for unforeseen situations.

Although participants generally recognized that hiding income from one's spouse could create tension, many viewed it as a necessary strategy to protect household welfare and avoid potential conflicts.

3.2.3 Gender division of labour for maize production in graphs below for the districts and by camp

This section presents the gender division of labour in maize production across the surveyed districts and camps. The results show how men and women participate in different stages of maize production, from land preparation and planting to harvesting and marketing (Figure 7) Understanding these patterns helps highlight the roles and responsibilities assigned to each gender, as well as potential areas where labour burdens or decision-making power may be unevenly distributed. Such insights are essential for the EcoPM project to support the design of interventions that promote equitable participation and benefit-sharing in maize farming.

The gender division of labour in maize production shows distinct patterns across Petauke and Chipata districts. In Petauke, men dominate activities such as selling (81%), chemical spraying (78%), and digging (78%), while women's participation is notably lower in these tasks, ranging from 18% to 22%. For other tasks like harvesting, fertilizer application, weeding, and monitoring/scouting, labour is fairly equally shared between men and women, with percentages close to 50% for each gender.

In contrast, Chipata presents a more balanced or even female-skewed labour distribution across many activities. Women participate more heavily in harvesting (59%), monitoring/scouting (58%), fertilizer application (63%), weeding (63%), and digging (51%), surpassing men's involvement in these areas. While men still lead in selling (63%) and chemical spraying (65%), the gender gap in these activities is narrower than in Petauke.

Overall, Chipata exhibits greater female engagement in core farming activities, indicating a more equitable sharing of labour between men and women. Meanwhile, Petauke shows a more traditional division, with men predominantly undertaking physically intensive tasks and marketing roles, and women contributing primarily to labour-intensive yet less market-facing activities.

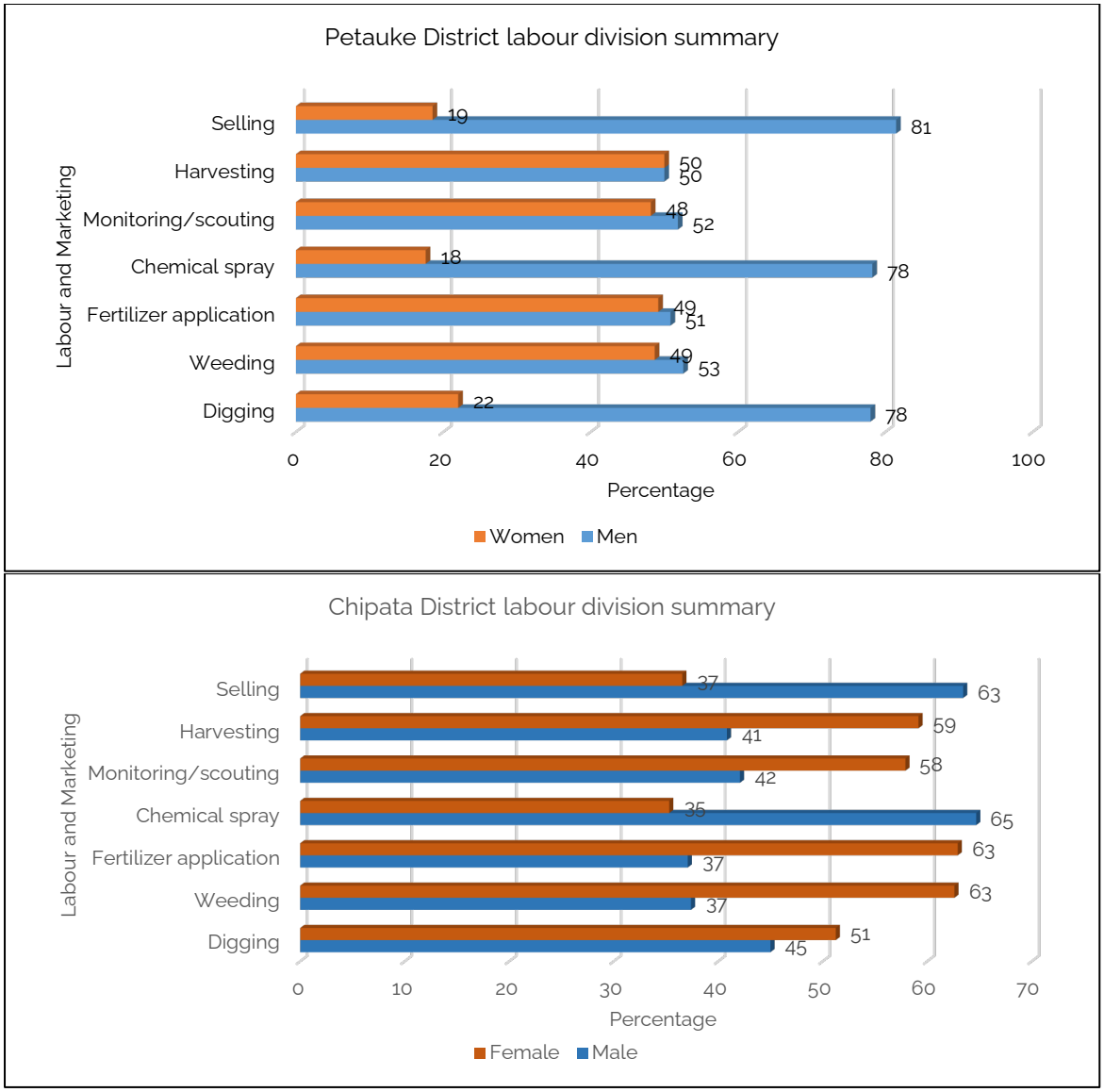

Figure 7: Gender division of labour for maize production in Petauke

3.3 Maize production and marketing challenges

3.3.1 Major Challenges in Maize Production and Marketing

Maize farmers face several challenges that limit productivity and income, with women often disproportionately affected. These challenges include issues related to pests, climate, land, training, markets, extension services, and transportation. The key obstacles are detailed below.

Pest Infestation: Pest attacks remain a significant problem, with limited access to modern pest control methods. Women are disproportionately affected due to income disparities, often relying on traditional practices such as handpicking pests or applying sand, which are less effective.

- **Climate Change**: Erratic rainfall patterns—including late starts, early cessation, floods, and droughts—pose severe risks to maize production, affecting planting and harvest cycles.
- **Land Availability:** Many farmers have insufficient land for cultivation, with over 50% of available land typically dedicated to maize production, limiting crop diversification and expansion.

- **Limited Technical Training and Innovation Adoption**: There is a widespread lack of access to agricultural training and new technologies. Women, in particular, face barriers to attending training sessions, resulting in low adoption rates of improved practices.
- **Market Challenges**: Farmers struggle with low and fluctuating maize prices, which undermine profitability, especially for women with smaller landholdings.
- **Extension Service Constraints:** Follow-up support after training sessions is inconsistent. Extension workers face logistical challenges such as unreliable transport, reducing their ability to provide continuous assistance. Furthermore, many extension agents lack gender-specific training, which limits their effectiveness in addressing women's unique needs.
- **Transportation and Infrastructure**: Poor Road conditions further exacerbate access issues, particularly for women, restricting their ability to transport produce to markets efficiently.

3.3.2 Maize pest management challenge and training needs

Not all camps have Camp Extension Officers (CEO), implying some farmers haven't received training in maize pest management or other maize production-related topics. While some farmers have regular meetings and training sessions with the Extension Officers, others do not meet as frequently due to the distance between farms and the camps, which is further complicated by a lack of transportation for the CEOs.

Specific challenges faced by Women in regard to training:

- The distance to training locations is a significant barrier for women.
- Training schedules often do not accommodate women's availability, especially when sessions are held in the morning.
- Inconsistency of trainers can lead to gaps in knowledge, as farmers may miss important topics if trainers do not attend regularly.
- The use of technical language during training creates communication barriers, making it difficult for some participants to fully grasp the content.
- Training materials are sometimes written in languages that not everyone can understand.
- Inadequate information is provided during training sessions; there are often no physical demonstrations or field practicals. The absence of demonstration plots can make it difficult for women (and men) to remember what was taught. Demonstration plots serve as valuable reminders of the training.
- Many women are not recognized as farmers, resulting in fewer training opportunities for them, while they are often expected to care for children. This situation is particularly common among young couples and can lead to a loss of interest in training among young women.
- There is a need for hands-on training for women in managing maize pests.
- Future pest management training should be conducted closer to women's homes to improve accessibility.

3.4 Enhancing Participation in Maize Production and Agricultural Training

3.4.1 Enhancing Women's Participation in Maize Production and Agricultural Training

To increase women's involvement in agriculture and ensure they benefit fully from training opportunities, several targeted strategies are needed:

- Encourage women to actively participate in agricultural trainings by raising awareness about the benefits of agriculture.
- Promote the formation of women's groups and clubs, providing them with more frequent and focused training sessions.
- Include women in cooperative leadership roles to improve their access to information and training opportunities.
- Engage husbands to support and encourage their wives' participation in farming trainings.

- Incorporate demonstration plots in training programs to show women practical, visible results after sessions.
- Ensure early announcements of trainings with a special emphasis on encouraging women's attendance.
- Increase the number of demonstration plots to provide accessible, hands-on training for women farmers.
- Empower women through groups that also provide financial education, framing farming as a viable business opportunity.
- Bring in dedicated trainers who specialize in women's agricultural capacity-building.

3.4.2 Specific training needs for both women and men in maize production include:

Effective training programs must address both men's and women's knowledge gaps across the entire maize production cycle, from planting to marketing. Some of the specific training needs identified during the survey included.

- Comprehensive maize production practices from planting to marketing
- Adoption of new agricultural technologies
- Pest management techniques and safe pesticide use
- Post-harvest handling and technologies
- Innovations for controlling Fall Armyworm (FAW)
- Importance of early planting and recommended maize varieties
- Farming as a business, including record keeping and income management
- Pesticide production methods
- Understanding the impacts of climate change on agriculture
- Crop scouting for pests and diseases, especially in maize
- Agricultural technologies that simplify farm activities
- Soil fertility improvement techniques
- Farm management knowledge
- Conservation agriculture practices

4. Results summary, conclusion, and recommendations

4.1 Conclusions: gender considerations and measures to prevent unintended negative impacts

The findings of the Gender Needs Assessment study for the EcoPM Project in Zambia reveal that women face significant disadvantages in accessing agricultural trainings and on-farm demonstrations. Although both men and women grow maize, men generally have better access to farming knowledge and accurate information through training. Socio-cultural norms often limit women's ability to benefit from these interventions, as household decisions traditionally require male approval. Additionally, women encounter social and economic barriers that reduce their capacity to cope with climate change impacts, such as the increasing infestations of Fall Armyworm (FAW), which threaten crop yields and household wellbeing.

Integrated Pest Management (IPM) offers a promising approach to mitigate FAW infestations while minimizing risks to human health and the environment. When implemented with a gender-responsive lens, IPM can address the distinct needs and knowledge of both women and men, thereby improving the sustainability and effectiveness of pest control strategies. Given women's critical role in agriculture and household food security, empowering them through targeted training and support is essential.

However, to prevent unintended negative impacts and ensure equitable participation, it is crucial to recognize and address existing cultural and structural barriers. Since men are traditionally heads of households and decision-makers, women's involvement in agricultural projects may be restricted if husbands do not support their participation or perceive them as lacking necessary

knowledge. Moreover, some interventions have not adequately engaged traditional leadership, which holds significant influence within communities.

To mitigate these risks, the project will work closely with traditional leaders, government departments, NGOs, CBOs, and other local organizations to build strong partnerships and ensure inclusive community engagement. Sensitization and education of traditional leaders, alongside involving local leadership structures such as Camp Agriculture Committees (CAC) and Zone leaders, are critical to gaining community buy-in and supporting sustainable agriculture development.

Collaboration with the Ministry of Agriculture, through the Zambia Agriculture Research Institute (ZARI), and district agricultural offices will ensure alignment with national strategies and strengthen advisory and training services. Furthermore, engaging local training and research institutions will help establish long-term support systems for farmers.

Importantly, project interventions will consider women's specific needs and challenges, including their triple burden of domestic, productive, and community roles, which may limit their availability. The project will apply the "Gender Strategy for Agro-ecological Management of the Fall Armyworm in Eastern and Southern Africa (AgEco IPM)" as a guiding framework to enhance gender equity and effectiveness in the IPM program.

4.2 Summary of results and recommendations

Table 1 provides a comprehensive summary of the key findings from the survey alongside actionable recommendations for the project. It outlines the major issues identified, presents a concise overview of the results, and offers targeted suggestions to address these challenges. The recommendations primarily focus on gender-related aspects, emphasizing strategies to improve women's participation and benefit from agricultural interventions. Due to their broad applicability, these recommendations can be easily adapted and integrated into a wide range of agricultural projects across Zambia, ensuring that gender considerations are effectively mainstreamed in future initiatives.

Table 1: Summary of results and recommendations for the project

Issues	Summary of results	Recommendations for the project
Characteristics of the respondents	Across all the camps visited in the two districts, there is a substantial proportion of female-headed households.	Based on existing evidence on productivity differences between MHH and FHH, targeting of FHH with provision of information, services, and technologies should be considered.
Access to training	Most women do not have access to training due to timing of the meeting/training, or the distance to the location In certain areas, extension services are not felt by the female farmers. On the other hand, Extension workers are unable to reach the farmers due to infrastructure/transport challenges	• Training must be accompanied by demonstration or practical work. This can be done through Farmers' Field School (FFS). FFS must be established in a location where women can easily have access to them. • Leader farmers and the Camp Agriculture Committee (CAC) must also be trained for them to be able to train other farmers and supplement and offer assistance to complement the extension services
Time, distance and location of the training/meeting do not favour women	Women are unable to go for training due to time, Distance, and Location Women end up listening to the radio and getting messages on the phones, and are lucky not to misunderstand the message because they are not seeing Women attend to a lot of tasks in the morning	• There is a need to package information for radio stations and radio stations must run the packaged messages timely e.g. message on planting to be aired before the planting time • Times for meetings and trainings must be conducted bearing in mind the triple burden of the woman, • they must target women in groups and accommodate their situations e.g. let women come to the meeting with the children and a helper

Inadequate training in pest management	The farmers, both male and female, need to have specific training on pest management.	-There is a need to further assess farmers' specific training needs -Additional information must be packaged on the various pest management methods -Chemical (proper) application to be considered
Women want to be trained alone	Most of the women's literacy levels are not as high as those of men in the community. This means women do not receive similar benefits from agricultural training services as men if trained together	• Demonstrations are the best way of adult learning (Seeing and doing) • Targeting women only for certain training would be important; this can be done through Farmer Field Schools (FFSs) and women 's groups. Most women belong to women's groups or cooperatives. • Training materials must be local language, this way women/everyone will understand and act.
Decision-making in relation to maize production, home use and sale	Evidence shows joint decision-making in maize production and sales, including reserves for home use. Women tend to have more control over maize for household food security and nutrition.	Working together as a family encourages joint decision-making. Farmers' Field Schools must be open to all family members, which will bring togetherness and strengthen teamwork for the farmers
Decision-making in relation to income	• In most households, almost all decisions about maize production are made jointly by men and women, but the household head usually has a final say in everything. • There is joint decision-making on income received from the sale of maize; this income is considered to be for the whole family. • However, this is not the norm when income is sourced separately by husband or wife	-Train farmers on farming as a business -Train farmers on proper record keeping for them to realise the importance of IPM in a business lens
Major challenges in maize production	Excessive rainfall promotes weed growth; FAW and stem borer infestations persist; Delays in government pest control support and high input costs limit access to seeds and fertilizers. Unpredictable rainfall from climate change, delayed input distribution through FISP, maize price fluctuations, and poor farmer planning also affect production.	Invite other stakeholders during trainings, such as agro dealers, seed companies, etc., to share information on developed technologies on climate change
Maize yields are reducing	Across all camps, both men and women experienced reduced maize yields over the recent years, and this is due to the challenges in maize production, more especially with FAW infestation	• There is a need to adequately train the farmers on the life cycle of the FAW • There is also a need to have further analysis on other factors that may affect maize yields, e.g., on the soils in the fields • Invite other stakeholders for specific training
Membership in cooperatives	Most farmers (both men and women) are members of groups and cooperatives	Leverage on women's groups or cooperatives as an entry point for the IPM technologies.
Access to extension service	Not all farmers have access to extension services because certain sections of the camps are located in remote areas with poor infrastructure and road network	To effectively cover the target farmers, there is need for the project to engage NGOs, CBOs or stakeholders with similar interests to facilitate.
Gender division of labour	Maize production activities are mostly done by women	Encourage the use of technologies that will lighten the women's triple burden

4.3 Gender awareness and mainstreaming among partners

Gender aspects crucial for project implementation must be integrated through external gender mainstreaming. Women generally have limited decision-making power in farming enterprises, which are often controlled by men. Given the training inequalities, the project should adopt a gender-sensitive strategy that specifically targets women where needed and includes gender mainstreaming training for implementers and partners.

Women's empowerment efforts should focus on strengthening their economic agency, using a household approach to address power dynamics and promote positive change at family and community levels (ActionAid, 2011). Existing women's groups, especially those involved in crop and livestock production, should be actively engaged in all gender mainstreaming activities. If IPM practices disseminated by the EcoPM project are male-dominated/oriented, involving local leadership from the start is essential for success.

Below are proposed strategies for enhancing gender-inclusive Integrated Pest Management (IPM) Implementation

- Design interventions that increase IPM awareness among women farmers, combining income generation with agriculture (maize production).
- Planned activities should support women, including those from low-income families, to help them manage climate change-related risks such as FAW.
- Design and implement gender-friendly versions of "farming as a business" for easier adoption.
- Interventions should focus on building an asset base for female-headed households and poor women and men in general. These groups need improved access to service providers such as micro-credit and insurance, tailored to the poorest and most vulnerable in farming communities.
- Encourage and engage other stakeholders with similar projects and programs to increase awareness of gender differences when designing products and distribution channels (GIZ, 2017).
- Collaborate with the lead authority to develop a national financial inclusion strategy that incorporates gender considerations related to access and use of insurance (GIZ, 2017).
- Implement gender-sensitive financial literacy strategies, including insurance education that addresses women's specific needs and behaviors, using the most effective channels to reach them (GIZ, 2017).
- Strengthen farmers' awareness of gender issues and dynamics by designing gender-sensitive messages and awareness materials focused on nutrition, health education, and behavior change.
- Enhance planning capacities and decision-making processes of men and women farmers regarding pest control and improve their understanding of IPM practices in maize production.
- Build the capacity of local organizations to monitor and evaluate practices using sex-disaggregated data.
- Support community-based savings and lending initiatives as vehicles for rural empowerment, noting that such schemes have successfully promoted women's economic empowerment.
- Incorporate specific strategies to consult with women, ensuring insights inform product design, distribution, and servicing through trusted organizations and channels, following a client-centric approach (InsuResilience Global Partnership, 2018).
- Remove recognized regulatory barriers that hinder women's access to Integrated Pest Management, including message packaging.
- Gather and analyze sex-disaggregated data on access to and use of IPM across different product types. To support this, build internal capacity among supervisors to monitor IPM practices, develop mechanisms for data collection and reporting, and adapt accordingly.

4.4 Suggested indicators to track gender integration into the EcoPM project in Zambia

Table 2: Results framework

Goal	**Formulation of concrete gender indicators or criteria for embedding gender dimensions in the results framework. *Specific guiding questions*** **Results framework description**: The goal of the project is to enhance the resilience of rural households, particularly smallholder farmers, to the impacts of climate change. This will be achieved by improving their access to climate risk information, such as Integrated Pest Management (IPM) practices. Additionally, the project aims to increase the participation of women in agricultural activities to help address the challenges posed by climate change in the targeted areas. Furthermore, we plan to introduce more IPM products specifically for female farmers. **Indicators:** • The measure for this result would be the % of women population with increased productivity and income in the community despite climate change impacts • The measure for this result would be the % of women's participation in IPM training, farmer field schools and demo plots
Outcome	**Results framework description:** Farmers have reduced income losses; Farmers receive training/awareness on IPM information and the different practices **Indicators:** # of women farmers with reduced income losses # of women trained on IPM practices # of women practicing the different IPM tools
Output	**Results framework description:** Farmers are sensitized and capacity built on IPM practices and start applying on their crops **Indicators:** # of farmers receiving IPM training and information # of farmers participating (applying IPM on their maize crops) % increase IPM use by women and youth (at least 50% of the by women to be below 35 years)
Activities	**Results framework description:** Sensitize farmers on maize production and various methods of IPM **Indicators:** • Number of women farmers accessing agricultural IPM practices • Number of women farmers accessing risk climate change impact prevention measures • Women farmers 'participation in agricultural and risk management trainings provided by the intermediaries, government departments or the private sector (e.g. financial institutions, contract farming, agribusinesses, networks of savings groups) • Inclusion of women in technical trainings for agriculture, finance and production marketing topics, including non-monetary incentives and gender-sensitive training designs • Access for women to distributed assets and inputs, such as seeds, IPM products or technical knowledge

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This report was produced through the Agro-ecological innovations for smallholder pest management (EcoPM) project in Malawi, Uganda and Zambia. The project was commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) under the Fund for the Promotion of Innovation in Agriculture (i4Ag).

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