

**GENDER-RESPONSIVENESS IN AGRICULTURAL EXTENSION SERVICE
DELIVERY: AN ASSESSMENT OF EXTENSION WORKERS
COMPETENCIES IN UASIN GISHU COUNTY KENYA**

BY

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DECLARATION

Declaration by Candidate

This thesis is my unique work. In no other university has it been presented for a degree. No part of this thesis may be duplicated without the author's and/or Moi University's prior written consent.

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DEDICATION

This thesis is dedicated to the steadfast male and female farmers whose unequal access to resources, resilience and hard work are the true backbone of our agricultural communities.

To my late mother and my father, who cherished education deeply, even though they never had the opportunity to attend school themselves and who made countless sacrifices to ensure that we, their children, could be educated.

Saving the best for last, to my beloved family, whose unwavering support and encouragement have been my foundation of strength throughout this challenging journey of thesis writing.

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ABSTRACT

Agricultural productivity in Uasin Gishu County remains below potential, with maize yields averaging 4.0 t/ha against an attainable 6.75 t/ha and milk yields stagnating at 5 litres per cow per day compared to the potential 20 litres. Existing studies show that gender inequalities significantly constrain productivity: Irish potato production records an 11% yield gap favouring men, while women who make up 61% of smallholder dairy farmers continue to face restricted access to land, technology and extension support. Agricultural extension workers are critical in addressing such disparities. There is strong gender-mainstreaming commitments within Kenya's agricultural policies, however production gap persists indicating limited translation of policy intent into field-level practice. Evidence points to limited gender competencies among staff. Despite this concern, empirical analysis of the gender-responsiveness of extension competencies in Uasin Gishu has remained scarce. This study therefore assessed the competencies of agricultural extension workers in responding to gender-related challenges affecting agricultural productivity in Uasin Gishu County. Guided by the Gender Transformative Change (GTC) theory and a pragmatic paradigm, the study focused on three objectives: determining the training in gender issues received by extension workers, examining the integration of gender issues into extension work and identifying interventions to enhance gender-responsive service delivery. A descriptive research design within a sequential transformative mixed-method approach (with quantitative priority) was employed. Using Yamane's (1967) formula, a sample of 90 extension workers was drawn from a population of 116 and proportionally stratified by gender and deployment area. Quantitative data were collected using a customized UN-based tool for assessing capacity to promote gender equality, while interviews with six farmers (three men and three women) provided qualitative insights. Findings revealed that 86% of extension workers had not received adequate gender training and about half did not integrate gender considerations into service delivery. Farmer interviews confirmed male-biased extension support. Respondents identified gender training (100%) and provision of gender manuals (80%) as key interventions. The study concludes that strengthening gender-responsive knowledge, skills and tools among extension workers is essential for reducing gender disparities and improving agricultural productivity in Uasin Gishu County.

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ABBREVIATIONS/ACRONYMS

AFC	Agricultural Finance Corporation
AfDB	African Development Bank
AIDS	Acquired Immune Deficiency Syndrome
AMS	Agricultural Machinery Services
ASDSP	Agricultural Sector Development Support Programme
ASTGS	Agricultural Sector Transformation and Growth Strategy
ATC	Agricultural Training Centre
CIDP	County Integrated Development Plan
EU	European Union
FAO	Food Agriculture Organization
FASDEP	Food and Agriculture Sector Development Policy
FF	Female farmer
MF	Male Farmer
GDP	Gross Domestic Product
GOK	Government of Kenya
GTC	Gender-Transformative Change
HIV	Human Immunodeficiency Virus
ICT	Information Communication Technology
IFAD	International Fund for Agricultural Development
ILRI	International Livestock Research Institute
KASEP	Kenya Agriculture Sector Extension Policy
KCEP	Kenya Cereal Enhancement Programme
KIPPRA	Kenya Institute of Public Policy and Research Analysis
KLA	Kenya Land Alliance

Landac	the Netherlands land academy
MOALF	Ministry of Agriculture Livestock and Fisheries
MTP 4	4 th year Medium Term Plans
NACOSTI	National Commission for Science, Technology and Innovation
NAEP	National Agriculture Extension Policy
NASEP	National Agriculture Sector Extension Policy
RISING	Research in Sustainable Intensification for the Next Generation
SOPs	Standard Operating Procedures
SWCP	Soil and Water Conservation Programme
UG	Uasin Gishu
UN	United Nation
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
WB	World Bank

DEFINITION OF TERMS

Agricultural extension service refers to a system that enables farmers and value chain actors to access knowledge, information, technologies, as well as engage with researchers, educators and agribusinesses to enhance their technical, organizational and management skills (NASEP, 2012). This study adopts the NASEP (2012) definition.

Agricultural extension workers are intermediaries who transmit research-based information to farmers and support their decision-making (Bichi and Ahmad, 2010). They bridge research institutions and farming communities, ensuring that technologies align with local norms and values (Mulder, 2014). For this study, they are defined as professionally trained agricultural personnel who act as change agents by disseminating technologies, guiding farmers in problem-solving and linking them with key value chain actors.

Agricultural productivity refers to the efficiency with which land, labour, capital and related resources are used in agricultural production (Dewett and Singh, 1966). This study adopts Dewett's definition because these production factors including extension services are influenced by gender. Therefore, the more gender-responsive these factors are, the higher the expected agricultural productivity.

Gender competence is the ability to recognize and address gender perspectives within one's work to promote gender equality (Adams, 2012). In this context, it is the extension workers' capacity to identify gender-

related issues affecting productivity and apply this understanding in their service delivery.

Gender is a social construct referring to the roles, behaviours and attributes that society assigns to individuals based on perceived sex, shaped by cultural and historical contexts and varying across time and place (Reeves & Baden, 2000; Maguire, 2006). This study adopts this definition to examine differences between men and women in accessing agricultural resources, opportunities and decision-making power.

Gender issue is an undesirable point of inequality arising from discrimination or oppression, requiring intervention; it is sometimes termed a gender concern (GoK, 2010). In this study, it refers to specific inequalities or differential treatment between male and female farmers based on socially assigned roles and expectations.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This section presents the introductory part of the study. It comprises of the background, statement of the problem, significance, justification, objectives, research questions and the scope of the study.

1.1 Background of the Study

About 80% of the world's poorest people live in rural areas, many of whom depend on agriculture for their livelihoods (Lall, 2025; UN, 2023). In such contexts, the competence of agricultural extension workers rather than the availability of extension services plays a key role in determining whether farmers fully benefit from agricultural innovations. Productivity gains increasingly depend on how effectively farmers convert inputs into output, a process shaped not only by technology but also by the social realities that influence farmers' decisions (Pinnawala & Herath, 2014). These social realities are gendered, meaning men and women experience agricultural opportunities, constraints and external conditions differently.

Extension workers therefore need gender competence; the knowledge, skills and attitudes that enable them to recognise gender-based differences and address them in service delivery. Gender competence is acquired through formal training, in-service learning and field practice, where extension workers learn how gender affects access to resources, participation in training, mobility, labour roles and decision-making. A gender-competent extension worker is better positioned to tailor advisory messages, choose appropriate extension methods, advocate for inclusive policies and ensure that

both men and women farmers benefit equitably from agricultural interventions (Manfre et al., 2013; KASEP, 2023).

The need for such competence is particularly important in Kenya, where gender-related barriers such as women's limited access to productive assets, training and decision-making power continue to constrain agricultural performance (KASEP, 2023). Social norms often determine who is considered a "farmer," who attends training and who controls farm resources. Although Kenya's policy framework including the Constitution (2010), Kenya Vision 2030 and recent agricultural policies emphasizes gender equality in service delivery, implementation depends largely on the capacity of extension workers to translate these policies into practice (Agricultural Sector Transformation and Growth Strategy 2022-2029; Agricultural Policy, 2021).

Globally, countries such as India and Ghana have embedded gender considerations in agricultural extension programmes, recognizing the need for gender-responsive information and equitable access to advisory services (MANAGE-NGRCA, India; PlantwisePlus, Ghana, 2024). Conversely, Tanzania's experience shows that without deliberate attention to gender, even strong data systems and gender-aware policy frameworks may not result in truly gender-responsive agricultural policies (Ministry of Agriculture & University of Dar es Salaam, 2021). These examples underscore that policy commitments alone are insufficient; the frontline extension worker's competence is what ultimately determines whether gender equity is realised in practice.

Gender constraints in agriculture are often attitudinal and require personal transformation among extension personnel to appreciate the value of equity in agricultural outcomes (De Turk, 2006; Cohen & Lemma, 2011). Without such

transformation, gender mainstreaming remains superficial. Despite the central role extension workers play, limited empirical work has examined their gender-related knowledge, skills and responsiveness particularly in Uasin Gishu County where gender disparities influence agricultural productivity according to Machoka et al, (2022). This gap highlights the need for research that assesses the gender competencies of agricultural extension workers and how these competencies influence their ability to address the gendered challenges faced by male and female farmers.

1.2 Statement of the Problem

Agricultural productivity in Uasin Gishu County remains below its potential (Uasin Gishu County CIDP 2023-2027). Maize yields averaged 4.0 t/ha against an attainable 6.75 t/ha (GoK, 2024), while smallholder dairy farmers produced 5 litres per cow per day, far below the potential 20 litres under improved management (KNBS, 2024). These productivity gaps persist alongside strong national and county-level gender mainstreaming commitments articulated in the National Agricultural Policy (2021) and the ASTGS (2019–2029), indicating a disconnect between policy intentions and field-level implementation.

Gender inequalities contribute significantly to these productivity constraints. Studies in Uasin Gishu reveal an 11% production gap in Irish potato farming in favour of men due to unequal access to land, inputs and extension support (Machoka, 2023). Although women constitute 61% of smallholder dairy farmers, they face barriers in accessing credit, markets and information, limiting their productivity and commercialization potential (Naimasia, 2021). Such disparities reflect inadequacies in addressing the specific needs and constraints of male and female farmers.

Agricultural extension workers are critical actors in reducing these disparities, yet evidence shows persistent gaps in their gender competencies. Many extension officers possess strong technical expertise but limited knowledge, skills and attitudes necessary to integrate gender perspectives into service delivery (Lopokoiyit et al., 2011; Njuki et al., 2020).

This mismatch between gender mainstreaming policy and the actual capacity of extension staff undermines equitable access to agricultural innovations, reduces technology adoption among women and reinforces productivity gaps. Given Uasin Gishu's economic importance, documented gender disparities and extension capacity challenges, assessing how gender influences agricultural productivity and how extension worker competencies shape gender-responsive service delivery is both timely and essential. This study therefore investigates the interaction between agricultural productivity, gender dynamics and extension capacity in Uasin Gishu County, aiming to identify actionable strategies for strengthening gender-responsive agricultural extension.

1.3 Research Objectives

1.3.1 General Objective

This study aimed to assess the competencies of agricultural extension workers in responding to gender-based challenges affecting agricultural productivity in Uasin Gishu County, Kenya.

1.3.2 Specific objectives were to:

- i. Determine the training in gender issues received by extension workers in Uasin Gishu County, Kenya.

- ii. Examine the integration of gender issues into agricultural extension work in Uasin Gishu County, Kenya.
- iii. Identify interventions to promote extension workers' responsiveness to gender issues affecting agricultural productivity in Uasin Gishu County, Kenya.

1.4 Research Questions

With relation to the objectives outlined above, the research sought to answer the following questions.

- i. What training on gender issues do agricultural extension workers in Uasin Gishu County receive?
- ii. To what extent are gender issues integrated into agricultural extension work in Uasin Gishu County?
- iii. What interventions can promote extension workers' responsiveness to gender-based challenges affecting agricultural productivity in Uasin Gishu County?

1.5 Significance of the Study

The study directly informs the Kenya Agricultural Policy (2021), which requires gender mainstreaming and improved extension service delivery. It supports implementation of the ASTGS (2019–2029) and gender mainstreaming actions as per the performance contracting guidelines (2014) by providing evidence on whether extension workers possess the competencies needed to translate these policy commitments into practice.

For policymakers, the findings help bridge the gap between policy intent and implementation by highlighting the capacity gaps that hinder gender-responsive extension. For extension institutions and development partners, the study guides the design of targeted capacity-building programmes that enhance service delivery and

productivity outcomes for both men and women farmers. For society, the study contributes to more equitable resource distribution, improved household food security, and higher agricultural productivity, given that gender inequality continues to reduce efficiency and slow rural economic growth.

Failure to address the identified competency gaps would perpetuate the exclusion of women farmers from critical advisory services, limit the adoption of modern technologies and sustain productivity losses undermining national goals on food security and inclusive, gender-responsive agricultural growth

1.6 Justification of the Study

The study is justified because global and national actors including IFAD, UN agencies and the national agriculture sector continue to strongly call for gender-sensitive agricultural interventions, noting persistent gaps in women's access to land, labour, technology and decision-making (IFAD, 2024; FAO, 2025, KASEP,2023). Gender mainstreaming is a legally mandated requirement for the agricultural sector in Kenya, yet evidence consistently shows weak implementation at operational levels (Agricultural policy,2021). Kenya's Public Sector Performance Contracting Tool Kit (2014) requires ministries, departments and agencies to assess institutional gender awareness and identify gaps, an obligation this study directly fulfils by assessing the competencies of extension workers, who are the frontline implementers of agricultural policies.

Manfre et al. (2013) further emphasize that extension systems must go beyond counting male and female participants and instead understand gendered differences in labour, time use and productivity. The Ministry's advertisement for the Project Enhancing

Gender Responsive Extension Services (PEGRES) position in the *Daily Nation* newspaper on 12th April 2016 p.35 also demonstrates institutional recognition of the need to strengthen gender-responsive extension capacity a need this study addresses.

Uasin Gishu is justified as the focus due to its economic significance, high agricultural output and documented gender-based productivity gaps, making it an ideal site for assessing how extension worker competencies influence gender-responsive service delivery and agricultural performance.

1.7 Assumptions of the Study

The study assumed that extension workers responded honestly to the survey and interview questions regarding their competencies and practices. It further assumed that gender influences access to agricultural resources and productivity outcomes, in line with existing evidence. The study also proceeded on the assumption that the extension structure and staffing in Uasin Gishu County reflect the operational standards of the Ministry of Agriculture. In addition, it was assumed that farmers' productivity challenges are, at least in part, influenced by the quality of extension services they receive.

1.8 Limitations of the Study

The study relied on self-reported data, which may be affected by social desirability bias, particularly on sensitive issues such as gender attitudes. It also focused exclusively on public extension workers, which limits the generalizability of the findings to private-sector or NGO-based extension agents. Additionally, resource constraints confined the study to a single county, meaning the results may not fully represent gender-competency levels across Kenya.

1.9 Scope of the Research

The study was conducted in Uasin Gishu County, Kenya, in 2018. The County comprises six sub-counties and thirty wards, with a ward being the smallest unit for extension service delivery. Agricultural extension workers operate at three levels: county headquarters, sub-county headquarters, and wards. Uasin Gishu was selected because it is one of Kenya's leading agricultural counties, dominated by smallholder farmers who rely heavily on public extension services. The study focused mainly on maize and dairy production, where gender roles, labour division and access to resources significantly influence productivity outcomes.

The county's structured network of sub-counties and wards provides an ideal setting for assessing gender competencies across multiple administrative levels. Additionally, Uasin Gishu operates with approximately 1 officer per 1,200 farmers, far below the recommended 1:600 ratio (KASEP, 2023), further constraining the ability to offer targeted and gender-responsive services a high concentration of male and female farmers who regularly engage with extension officers, offering a practical context to examine how gender-responsive practices are implemented on the ground. Despite the Agricultural Policy (2021) emphasizing the mainstreaming of gender in the agricultural sector, persistent gaps in access to information, technology and productive assets underscore the need to assess whether extension workers possess the necessary gender competencies. Insights from this study are therefore directly relevant for enhancing county-level agricultural strategies and may offer scalable lessons for other high-potential agricultural counties in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section presents literature review on training in gender issues for agricultural extension workers, integration of gender issues into agricultural extension work and the possible interventions identified as necessary to promote extension workers' responsiveness to gender-based challenges affecting agricultural productivity.

2.1 Training in Gender Issues for Agricultural Extension Workers

The literature reviewed reveals several critical gaps in the gender training of agricultural extension workers and this study directly responds to these deficiencies. The findings of Grünber (2011) in her case study on, "*gender-inclusive curriculum in higher education*", in the University of Belgrade, Serbia, showed that, there was an opposition to the perceived consensus on gender mainstreaming in formal organization-related aspects. The management body of the institution considered gender mainstreaming as an interference to the intellectual autonomy of the departments, the actual academic topics and choice of faculty. Grünber (2011) demonstrates that efforts to mainstream gender in academic institutions often face administrative resistance, resulting in partial or weak integration of gender content within agricultural curricula. By examining whether extension workers emerging from such institutions possess the gender-related knowledge, skills and attitudes required for practice, the present study provides empirical evidence on the effectiveness and limitations of these training environments. Grünber's observation that gender dimensions appear only in some course units is also addressed here, as the study assesses the extent and nature of gender

training extension workers received during college, thereby revealing how such fragmented curriculum exposure translates into actual competencies in the field.

During a ministerial conference on “Higher education in agriculture in Africa”, held at Speke Resort Hotel, Munyonyo, Kampala, Uganda, on 15 – 19 November 2010, Margaret Najjingo Mangheni, Lillian Ekirikubinza and Lora Forsythe presented a research paper titled “*Gender issues in agricultural education within African universities*”. The trio argued that the inclusion of gender content in agricultural courses to improve students’ skills in gender analysis was beginning to take root. Mangheni et al. (2010) found that gender elements in agricultural programmes were frequently offered as elective units, limiting students’ exposure and reducing commitment to gender-responsive practice.

This study fills that gap by determining whether extension workers trained under such elective-based systems demonstrate adequate capacity to integrate gender in their day-to-day work, and by highlighting the consequences of treating gender as optional content. The review also shows that regional initiatives, such as Ethiopia’s Ministry of Agriculture guidelines and Kenya’s gender-mainstreaming requirements in performance contracting, emphasize the need for continuous competence development in gender mainstreaming. The study responds to this policy gap by examining whether such national and regional commitments are reflected in the actual in-service training received by extension workers in Uasin Gishu.

In addition, Lopokoiyit et al. (2011) noted that historical agricultural curricula rarely included gender training, leaving many extension workers insufficiently aware of gender-related issues. This study directly evaluates current levels of gender knowledge

and awareness among extension workers, offering insights into whether these longstanding deficiencies persist. Their argument that modern extension work requires non-technical skills, including gender responsiveness, is also addressed by assessing not only what extension workers know about gender but also how they apply this understanding in their interactions with male and female farmers. Finally, the increasing demand for gender-focused roles in programmes such as the Kenya Cereal Enhancement Programme (KCEP) underscores the evolving expectations of extension services.

By identifying the specific gender competencies extension workers currently possess and the areas needing further strengthening, this study contributes evidence that can guide future development of gender-responsive roles within extension systems.

Through this comprehensive approach, the study bridges the gap between policy prescriptions, academic discourse and the lived realities of extension practice. It provides context-specific evidence on gender training, competency levels and practice gaps thereby addressing the weaknesses highlighted across all reviewed literature and offering a grounded basis for strengthening gender-responsive agricultural extension in Kenya.

2.2 Integration of Gender Issues into Agricultural Extension Work

While gender is essential to understanding the context in which agricultural development occurs, it is often not integrated into agricultural extension work (Diaz and Najjar, 2019). Many systems have put a greater emphasis on promoting various agricultural extension projects without understanding the practical and cultural obstacles that prevent the disadvantaged gender, especially women from accessing the

most needed services (Mbo'o-Tchouawou and Colverson, 2014). If such obstacles as gender access to resources, decision making power, cultural norms and gender roles are not put into account when introducing an agricultural project to a community, then the community members, who are largely affected by these real-life barriers may not be effectively served resulting in a widened rather than reduced gender gap in agriculture. Therefore, gender-sensitive approaches should be integrated into agricultural extension to ensure that both female and male farmers fully benefit.

Farnworth (2010) argued that if agricultural extension system is to respond adequately to gender-based concerns, it is not enough to simply, 'add in' a gender component late in a given project's development. Gender concerns in agricultural extension requires a proactive and integrated approach and not to be treated as an afterthought. It requires strategic consideration from the beginning as argued by FAO (2011) and continuous integration rather than last-minute adjustments.

Resorting to superficial inclusion may fail to address deep-rooted structural inequalities. Knowing where the strengths, weaknesses and needs lie is the first step towards improving the overall agricultural extension system's capacity to advance gender concerns in agriculture. Agricultural programmes must consider gender from the beginning (FAO 2011). This is in recognition of the need to enhance the ability of extension workers to identify, respond and report on gender complexities and imbalances in their field activities. If gender is not a core part of the project from the outset, interventions may not effectively meet the needs of female and male farmers satisfactorily.

United Nations Development Programme “UNDP” (2012) argued that although awareness of gender issues was growing, addressing them was often understood to be “working with or focusing on women” rather than focusing on females’ and males’ gendered roles and relations. As such, this thesis underscored the importance of understanding integration of gender issues into agricultural extension work. Venort and Calixte (2019) in their study on "Gender integration in agricultural extension services in Haiti” showed that gender integration in extension services was promoted through donor-funded programmes. Some of the activities carried out in Haiti to achieve gender integration in agricultural extension included provision of incentives to female-headed households and female farmers as targeted beneficiaries of the programmes. The programmes also considered hiring gender specialists, developing extension activities that targeted women in work plans and budget documents and monitoring and evaluating gender focused activities.

There is evidence from this study that the donor-funded programmes promoted gender mainstreaming through training of extension workers who served in those programmes. It would be important for future studies to understand why donor-funded programmes promoted gender mainstreaming in agriculture more than the implementing ministries. This thesis outlined the possible areas to integrate gender dynamics in agricultural extension work in Uasin Gishu County such as gender access to agricultural land, technologies, training time, venue and methodologies.

2.2.1 Gender access to land

Land is the main resource and determinant in agricultural productivity. The African Development Bank “AfDB” (2016) report on “*Land ownership in Nigeria, Uganda and Tanzania*” showed that the proportion of women landowners was extremely low at 15%

on average, with Nigeria reporting women land ownership being 4% of the agricultural lands. Similarly, World Bank (2015) indicated that women represented just 15% of agricultural landowners ranging from 3% in Mali to 35% in Botswana and Malawi, or more than 50% in Cape Verde. The land insecurity among women has resulted in low social status, self-esteem and financial dependency thus impeding their economic empowerment (AfDB, 2016).

The Kenya constitution (2010) article 60(1) (f) aims to abolish prejudice against women in regards to inheritance and property. Furthermore, gender equality in terms of access to land is further entrenched by the National Land Commission Act of 2012, the Land Act of 2012, and the Land Registration Act of 2012.

While these acts are in place, most citizens are not yet fully aware that such legislative changes are likely to improve the lives of women if fully implemented. Moreover, traditions, culture, religious norms and practices continue to push against the implementation of the newly codified land rights guaranteeing greater equality for women in land and inheritance (UN, 2016).

In 2018, Kenya Land Alliance (KLA) disaggregated and analyzed 1,000,099 out of 3,200,000 title deeds issued by the GoK from 2013 to 2017. The report indicated that only 103,043 (10.3 %) title deeds went to women while 865,095 titles representing 86.5 % went to men (KLA, 2018). While the KLA audit looked at the general land ownership in Kenya, this study looked at how equipped, agricultural extension workers are, to recognize and respond to the impact of gender disparities of land access to agricultural productivity in Uasin Gishu County.

In the process, not only was information on gender access to land found but also information on control over land by men and women of different marital status, including the associated factors was obtained. Ultimately, the study provided insights into whether extension services contributed to bridging the gender gap in land access and agricultural productivity.

Nyberg et al. (2025) highlight that agricultural extension often overlooks structural gender inequalities, including women's access to resources, but do not specifically analyze land access. In Uasin Gishu, women's ability to benefit from extension is constrained by limited land ownership and control.

Studies on gender and land access in Kenya, including Koech (2020), show that women's poverty both limits their ability to acquire land independently and contributes to the insecurity of the land they access, which is often through male relatives or as a result of providing labour. While women may not hold formal ownership or secure tenure, they actively use land for cultivation, household production and income generation. Despite this functional access, much of the literature focuses on formal ownership and tenure, with limited attention to how women's access translates into agricultural productivity, decision-making, or engagement with extension services. This represents a critical gap of insufficient evidence on how agricultural extension methods respond to women's land access patterns and the role of male-mediated or labour-based access in shaping extension outcomes. My study addresses this gap by examining the competencies of agricultural extension workers in recognizing and integrating gender-differentiated land access into their service delivery. It provides local, empirical evidence to guide gender-responsive extension strategies in Uasin Gishu.

2.2.2 Gender access to agricultural technologies

Agricultural technologies are products, services or applications derived from agriculture that improve various input or output processes. They have made positive contribution to agricultural development. They improve agricultural yield, efficiency and profitability. These include, but not limited to; technologies that administer water more efficiently such as drip irrigation, technologies for preventing post-harvest losses and wastage and those that disseminate knowledge. They can reduce the time it takes to complete tasks, ease the difficulty of tasks and/or increase the productivity of existing labour (Manfre et al, 2017).

Lack of access to technologies and financial resources to pay for technologies may discourage farmers from using them (Ajani, 2014). Further, it may reinforce problems of low agricultural productivity (Manfre et al, 2013). When technologies are accessible to both male and female farmers, they can work to support increase in gender participation within agricultural value chains, crop and livestock performance and the benefits that accrue from production (Rubin et al 2013).

Thus the need for design and dissemination of agricultural technologies that can explicitly address gender gaps in productivity and support agricultural development goals (Manfre et al, 2017). There is evidence to suggest that technologies developed without considering the different end users' needs, have led to low uptake levels (Manfre et al, 2017). According to Jiggins (1986), designers of agricultural technologies did not have female farmers in mind despite their importance in food production and processing, resulting in difficult or even impossible for women to use. Jiggin's argument is applicable to date considering UN (2020) report, which stated that women's physical needs were often overlooked during technology design. A case in

point is a treadle pump for irrigating fields in Bangladesh and an irrigation pump, "money maker" in Kenya, which, were designed for an average weight and strength of a man, although women mostly used them. As a result, women suffered pain and exhaustion. Further, fertilizer in Kenya is typically sold in sealed 50-kg bags. These are heavy to lift, costly and require transportation and adequate storage, which most women are less likely to access. By recognizing the distinct gender needs, extension workers can better connect opportunities with the right technology and prevent worsening anyone's status.

2.2.3 Choice of time and venue for agricultural activities

Studies have shown that providing agricultural extension services to farmers can lead to significant increases in yield (Bindlish and Evenson, 1997). In addition, other studies suggested that both male and female farmers make significant contribution to agricultural production. Therefore, gender aspects must be considered when deciding on the training venues and time (time of day, day of week, time of year).

Numerous explanations have been offered on why female farmers are more likely to experience disadvantages in obtaining agricultural training than male farmers. Women perform multiple responsibilities with productive and caregiving work, leaving them with less time to participate in trainings and farm demonstrations compared to men. Further, women in conservative societies may not be allowed to participate in public events, as they are expected to spend their time exclusively on caring for their home or may not be allowed to be in the presence of men outside of their family (FAO 2015). Other practical constraints that hamper women from attending agricultural trainings include; restricted mobility for cultural reasons, lack of money for transport, or inability to leave their children (Subedi, 2008).

Conversely, men tend to be more mobile and have a greater presence in public arena where they can obtain information and knowledge about agriculture (Simiyu and Foeken 2014). Both Subedi and Simiyu et al highlighted how the choice of time and venue for agricultural training affects male and female farmers' participation.

The timing and venue of training influence who can attend and benefit from extension services. Therefore, if extension workers fail to accommodate either gender's schedules and mobility limitations, they may unintentionally exclude them from gaining agricultural knowledge and ultimately reduce their productivity. This thesis established the extent to which extension workers took into account male and female farmers' needs with regard to timing and venue when organizing for farmers' trainings.

2.2.4 Choice of extension methods

Educating farmers on novel techniques that they can first adopt and then utilize is the goal of agricultural trainings. KASEP (2023) states that some extension training methods are weak in addressing crucial issues such as mainstreaming of cross-cutting issues and targeting marginalized groups. The commonly used extension methods according to KASEP (2023) are; exhibitions, tours, farm visits, exchange visits, trade fairs, face-to-face, farmer to farmer, on-farm demonstrations, agricultural shows, field days, e-extension, mass media, videos, adaptive on-farm trials, agricultural information desks, social media platforms, technology shops (technology innovation units), agro-dealer shops and mobile training units (more common in arid and semi-arid lands).

Although KASEP (2023) has documented extensive range of extension methods, there remains a clear research gap regarding how these methods are adapted to address

gender-specific constraints and ensure equitable participation of men and women farmers.

Diaz and Najjar (2019) highlight that time-intensive trainings may conflict with women's household and caregiving responsibilities, though there is limited evidence on whether extension workers in contexts like Uasin Gishu County are trained to design and implement inclusive and flexible extension methodologies that accommodate these realities. Existing literature also tends to focus on the availability of diverse methods rather than their effectiveness in reaching men and women farmers or addressing gendered barriers such as access to technology, land or mobility. Furthermore, there is little empirical insight on whether extension agents systematically consider participant characteristics including gender, education and access to resources when selecting appropriate training approaches. My study fills these gaps by examining the extent to which extension workers in Uasin Gishu integrate gender considerations in their choice of extension methods, and how these methods influence female farmers' participation, access to agricultural knowledge, and ability to apply learned techniques, thereby generating locally relevant evidence to inform gender-responsive extension programming

2.2.5 Influence of gender concerns on extension service

Despite the clear evidence that integrating gender concerns in extension services can enhance women's decision-making, adoption of improved practices and agricultural productivity (Siaw et al., 2024), there remain notable research and knowledge gaps. Most existing studies, including the one in Uasin Gishu County, focus on identifying access-based barriers and time poverty among female farmers but do not systematically examine how extension workers operationalize gender-sensitive strategies in practice.

There is limited empirical evidence on the extent to which extension programmes consider women's specific constraints, such as caregiving responsibilities, land ownership and control over productive resources, when designing and delivering services. Although Siaw et al. (2024) emphasize capacity building and tailored support, few studies examine practical interventions that integrate gender concerns into the county's extension system and link them to measurable productivity gains.

My study fills these gaps by assessing how agricultural extension workers in Uasin Gishu County integrate gender concerns into their service delivery, with a focus on addressing female farmers' constraints, including land access, technology access and participation in extension activities, thereby providing empirical insights to guide gender-responsive extension strategies that can enhance productivity and inclusivity in the county.

The AFAAS (2022) workshop on integrating gender in agricultural extension and advisory services highlighted that many extension workers lack sufficient understanding of gender integration, have limited capacity to apply gender analytical tools and operate within weak institutional frameworks that inadequately support gender-responsive advisory services. Gender remains insufficiently mainstreamed within extension planning, implementation and monitoring. Structured mechanisms such as mentorship, peer learning and communities of practice sustaining gender competence are largely absent. These observations align closely with the focus of this study on assessing extension workers' competencies. More importantly, the workshop outcomes mirror the findings of this study. In both cases, it is evident that extension workers may not fully understand or consistently apply gender frameworks in their work. The study further demonstrates that although various extension methods and

approaches are in place, their effectiveness is hindered by these competency and institutional gaps, particularly in relation to women's access to land, technology and time-sensitive services. Conclusively, Objective 2 establishes that enhancing gender integration in extension work requires targeted capacity building and stronger institutional support systems. This logically leads to Objective 3: identifying and implementing interventions to promote gender responsiveness within agricultural extension services.

2.3 Interventions to Promote Extension Workers' Responsiveness to Gender Issues Affecting Agricultural Productivity

During a workshop convened by Africa Research in Sustainable Intensification for the Next Generation (Africa RISING), project in Addis Ababa, Ethiopia on 18-20 August 2014 on '*integrating gender into agricultural programmes*', a number of participants indicated that the participatory facilitation and exercises woven throughout the workshop were invaluable in understanding and integrating gender into their work. From the findings of my study extension workers needed support, backstopping and training to translate gender issues into practical changes in their work. Having knowledge and awareness of the ways in which gender issues affect agriculture and having skills in integrating them into extension work, enables extension workers to respond effectively to gender-based constraints.

A study to determine the professional competencies required by extension staff for effective extension work done by Lopokoiyit, Onyango and Kibett in 2011 in 6 counties in Kenya, Uasin Gishu included, showed that gender awareness was one of the required competencies. Their study indicated that gender was a non-technical competence required by extension workers to carry out their work effectively (Lopokoiyit et al,

2011). The training needs expressed by Lopokoiyit et al's study, pointed to a need for further analysis of gender concept in terms of content, depth and scope. Lopokoiyit et al did not state what exactly in gender, is critical to an extension worker. However, this thesis was able to outline areas in gender that require consideration during extension service delivery. While Lopokoiyit et al. (2011) identified gender awareness as a key competency, the GTC framework emphasizes that true transformation requires more than knowledge. It calls for critically challenging and changing entrenched gender norms, attitudes and power relations that hinder equitable participation and benefits in agriculture. For effective service delivery, extension workers ought to be a life to the major concerns of male and female farmers, viewing them as inherent part of the agricultural process and acknowledging, particularly women's work within the household as productive. Response to gender issues is greatly influenced by an individual's attitude, therefore there is need to facilitate behavioural change among the extension workers.

The impact of gender issues on the performance of agriculture sector is significant and would therefore need careful examination to identify them and their linkages (FAO, 2011). In order to help achieve this goal, there is need to move beyond old ideas and assumptions about who is considered a farmer and who is a helper and focus on new ways to understand and address the challenges faced in engaging farmers in new and better ways to improve agricultural productivity. This need to move beyond basic awareness to a deeper interrogation of gender issues, which aligns with the Gender Transformative Change (GTC) framework adopted in this study. It is important for extension workers to keep up with the changing world by increasing their understanding

about gender issues, as well as how to address them to improve agricultural productivity.

This study uses the GTC framework to build upon earlier findings by outlining not just the need for gender knowledge, but the structural and behavioural changes needed among extension service providers. By doing so, it seeks to promote a more inclusive and effective agricultural extension system, where gender equity is not only acknowledged but actively pursued as a pathway to improved productivity.

2.4 Theoretical Framework

The study is anchored on the Gender Transformative Change (GTC) theory, originally advanced by Verma (2013) within programmes aimed at addressing structural and relational gender inequalities. The framework was later expanded by Hillenbrand et al. (2015), who systematized it into a practical approach for agricultural and rural development. The GTC emerged from broader gender and development scholarship, particularly critiques of Gender and Development (GAD) and Women in Development (WID) approaches, which focused primarily on improving women's access to resources without sufficiently addressing the social norms, power dynamics and institutional structures that produce gender inequality. The theory therefore shifts the emphasis from remedial support to transforming the social systems, attitudes and power relations that shape gendered experiences.

At its core, GTC rests on several assumptions. First, gender inequality is embedded in social norms, institutions and cultural practices rather than individual deficits. Second, sustainable change requires internal reflection and behavioural transformation among individual men, women and institutional actors. Third, meaningful gender integration

must be institutionalized through policies, systems and organizational cultures rather than introduced as an add-on. Over time, subsequent scholars such as Apgar and Douthwaite (2013), Cole et al. (2014) and Farnworth and Colverson et al., (2014) have enriched the theory by emphasizing collective learning, critical questioning and co-creation of change among multiple stakeholders in agricultural systems.

The first principle of GTC emphasizes addressing the root causes of gender inequality, including restrictive norms, attitudes and institutional biases. Much gender-focused work in agriculture has traditionally targeted symptoms such as low women's incomes or limited technical knowledge by introducing income-generating projects or training. However, as Cole et al. (2014) and Farnworth and Colverson et.al., (2014) demonstrate, such approaches often fail because they do not confront underlying inequalities in resource control, labour divisions or decision-making. The GTC framework encourages deeper questioning to uncover hidden structures that constrain men's and women's participation in agriculture, aligning closely with this study's analysis of gendered access to land, technology, time and extension services.

The second principle of GTC addresses individual capacities and behavioural transformation. It highlights the need for extension workers and other institutional actors to develop gender knowledge, analytical skills, positive attitudes and reflexive practices. This principle informed the assessment of extension workers' gender competence in Uasin Gishu County, especially in relation to their ability to identify gender-based constraints, recognize women's invisible labour, and deliver gender-responsive extension services. As the theory asserts, transformative change must begin within individuals; therefore, the study interrogated the extent to which extension workers' training, attitudes and practices reflect a gender lens.

The third principle concerns institutional and systemic integration of gender. GTC argues that gender responsiveness must be embedded within organizational mandates, structures, monitoring systems and daily practices. This shaped the study's understanding of existence of frameworks calling for gender mainstreaming vis-a-vis on-the-ground implementation. The theory's emphasis on institutional embedding justified assessing whether gender considerations are mainstreamed in extension planning and service delivery, an area where earlier studies, including Lopokoiyit et al. (2011), were limited because they identified gender awareness as a competency but did not specify its scope or institutional dimensions.

Despite its strengths, GTC theory has limitations. First, transforming social norms and institutional cultures is a long-term process that may not align with project cycles or short-term evaluations. Second, the theory assumes a level of openness and willingness among actors to reflect and change, which may not always be present, especially in contexts with entrenched patriarchal norms. Third, most GTC applications rely heavily on participatory approaches, which are time-intensive and resource-demanding. Lastly, critics argue that while GTC addresses attitudes and norms, it sometimes provides limited direction on macro-level structural reforms, such as legal changes regarding land rights. These limitations informed the interpretation of findings, particularly in understanding why gender-responsive extension remains challenging despite existing training initiatives.

The GTC framework significantly informed data collection and interpretation. Guided by its focus on internal attitudes and structural constraints, the study used questionnaires to capture extension workers' knowledge, skills, attitudes and experiences in responding to gender-based constraints. Farmer interviews were included to triangulate

whether extension workers' claimed competencies translated into practice. The analysis of findings drew on GTC principles to evaluate not only what extension workers knew, but how they interpreted gender issues, how institutional structures influenced their work and where gaps persisted in translating gender awareness into responsive actions.

The application of GTC was further strengthened by integrating it with the pragmatic research paradigm, which emphasizes practical solutions and context-specific inquiry. Pragmatism complemented GTC by allowing methodological flexibility using both qualitative and quantitative approaches to explore gender norms, institutional environments and behavioural patterns within real-world extension settings. This synergy enabled the study to remain action-oriented and sensitive to local cultural contexts, reflecting the theory's emphasis on iterative learning and reflective practice.

In conclusion, the Gender Transformative Change theory provided a robust lens for examining extension workers' competencies and gendered constraints affecting agricultural productivity. It enabled a deeper understanding of how gender norms and institutional biases shape agricultural outcomes and guided the study in identifying practical interventions for strengthening gender responsiveness within extension services. The theory's relevance is evident in its alignment with the study's objectives, its capacity to explain persistent gender disparities in agriculture and its usefulness in informing context-appropriate recommendations for policy, training and institutional reform.

2.5 Conceptual Framework

The conceptual framework for this study is anchored in Gender Transformative Change theory, which emphasizes that gender norm, power relations and institutional structures

shape agricultural opportunities, constraints and productivity outcomes. In the context of Uasin Gishu County, agricultural extension workers' competencies comprising knowledge, skills, and attitudes, constitute the primary independent variables influencing the delivery of gender-responsive extension services and ultimately, agricultural productivity. The framework is designed to capture the main components of the research, aligning with the three specific objectives: assessing training in gender issues among extension workers, examining the integration of gender issues into agricultural extension work, and identifying interventions to enhance extension workers' responsiveness to gender concerns.

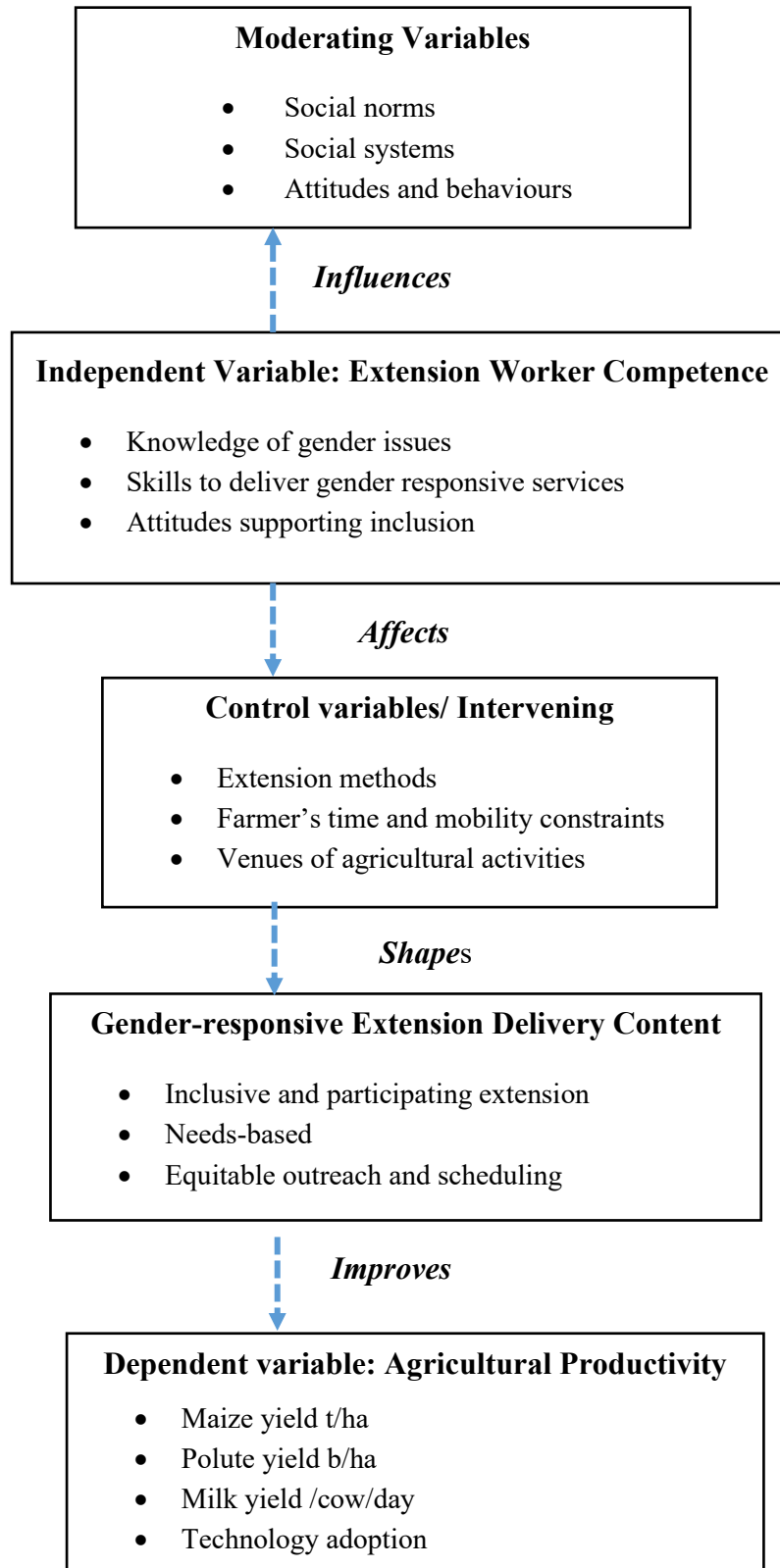


Figure 1: Conceptual framework showing interrelationships between key variables of the study

The conceptual framework integrates theory, objectives, and variables into a cohesive model for understanding gender-responsive agricultural extension in Uasin Gishu County. Anchored in GTC theory, gender functions as both a conditioning factor and a lens through which agricultural opportunities and constraints are interpreted. Extension worker capacity—knowledge, skills, and attitudes—forms the independent variable, shaping the design and delivery of services. The effectiveness of these competencies is mediated/ shaped by control variables: extension methods, farmers' time and mobility constraints, and activity venues, which are interdependent and determine who is reached and how effectively services are delivered. Moderating variables, including social norms, social systems, attitudes, and behaviours, influence how competencies and control factors translate into outcomes, explaining differences in productivity outcomes among male and female farmers.

The three specific objectives are embedded in the framework. Objective one assesses the training in gender issues, directly linked to competencies. Objective two examines integration of gender into extension work, operationalized through control variables and influenced by moderating factors. Objective three identifies interventions to enhance responsiveness, which target both competencies and operational factors to improve delivery and adoption. The immediate output, gender-responsive extension delivery, ensures inclusive, participatory, and needs-based outreach, which then drives the final outcome, agricultural productivity, measured using maize, potato, milk yields, and technology adoption. This framework thus provides a clear, theoretically grounded, and operationally actionable pathway linking extension worker competencies to gender-equitable productivity outcomes, while accounting for the socio-cultural and logistical realities of farming in Uasin Gishu.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides an overview of the processes, which were involved in carrying out the research. It explains the type of the study design used, study site and location, target population, sample size, sampling techniques, research instruments, pilot study, data collection and data analysis techniques. Ultimately, the study methodology aimed at answering the research questions.

3.1 Study Design

This study was guided by the pragmatic research paradigm. The choice of pragmatism was informed by the nature of the research problem, which was low agricultural productivity in Uasin Gishu County due to gender-based constraints, and it is unclear whether extension workers have the competence to address these inequalities effectively.

Given the multifaceted and context-dependent nature of gender issues, the study required both qualitative insights and quantitative evidence to gain a comprehensive understanding of the problem capturing not only the lived experiences and perceptions of agricultural extension workers but also identifying indicators that informed evidence-based interventions and policy decisions. As such, a pragmatic approach allowed for the use of mixed method research design, where the researcher utilized a sequential transformative mixed-method design with a quantitative priority.

Quantitative data was collected by use of a questionnaire from the extension workers, who were the core respondents. Thereafter, collection of qualitative data from six

selected farmers followed. Quantitative data informed the kind of questions asked in the qualitative study. For example, the quantitative data established the extent of integration of gender issues into agricultural extension work.

The extent of integration was measured using a Likert-type ordinal scale, where respondents selected one of four predefined levels: Not at all; To a limited extent; To a significant extent; To a very significant extent. These levels were quantified and presented as percentages of the total responses, indicating the proportion of participants who perceived gender integration at each level. This then led to a need for questions in phase two such as and not limited to; “How would you describe the training schedules in terms of timing (time of day, day of the week and time of year) and choice of venue”, “what about the training methods used by the extension workers” and so on. Such questions contributed to ascertaining the gender competence of agricultural extension workers in Uasin Gishu County.

From the quantitative data, it was possible to generalize the results to the entire population. It was also easier to suggest the course of action required, and this fitted well with the pragmatic philosophy, which seeks practical solutions while recognizing the importance of social and contextual factors. Qualitative information from the farmers was important in gauging responses from the core respondents and in providing additional information related to the respective cases. Integration of the two data sets occurred during the interpretation of the results.

3.2 Study Site, Target Population and Sampling Procedure and sample size

3.2.1 Study site

The data was collected from agricultural extension workers in all the six sub counties of Uasin Gishu County namely; Ainabkoi, Kapsaret, Kesses, Moiben, Soy and Turbo. in 2018. According to the Ministry of Agriculture annual report (2017) and Uasin Gishu county integrated development plan “CIDP” (2013), Uasin Gishu County is located within the Rift Valley and lies in the mid-west of the Rift Valley region. It extends between longitudes 34° 50’ East and 35° 37’ East and latitudes 0°03’ South and 0° 55’ North. It covers an area of 3,345.2 square kilometers.

The three agricultural zones that make up the County are the upper highlands, upper midlands, and lower highlands. Uasin Gishu county borders with the following counties; Trans Nzoia to the north, Elgeyo-Marakwet to the east, Baringo to the south-east, Kericho County to the south, Nandi County to the south-west, and Kakamega County to the north-west.

Uasin Gishu County was chosen for the study because it is experiencing a concerted policy drive to address gender inequality, notably through its 2025 *Gender and Community Development Policy*, which was developed in consultation with civil society and county government to close gaps in leadership, economic empowerment and land ownership (Kenya News Agency, September, 3 2025).

Despite these efforts, women in the county still hold only 18% of registered land titles, underscoring persistent gender-based constraints in agricultural access and resources (ICBNews February, 13 2025) Empirical research further highlights a significant gender productivity gap. Male Irish potato farmers in Uasin Gishu are about 11% more

productive than their female counterparts and closing this gap could increase total output in the county by approximately 6%. (Machoka, 2023). Meanwhile, the county's *Integrated Development Plan (CIDP) 2023–2027* prioritizes agriculture and gender mainstreaming as strategic pillars for sustainable development.

These intersecting social, economic, and policy dynamics make Uasin Gishu an ideal site for examining whether agricultural extension workers are sufficiently competent to mainstream gender in their service delivery and thus help address underlying productivity constraints.

3.2.2 Study population

According to the 2018 Uasin Gishu County Agriculture Annual Report, the county had 128 (60 men, 68 women) agricultural extension workers. Six comprising of 2 men (M) and 4 women (W) were deployed at the county headquarters, 7 (6M, 1W) at the Chebororwa Agricultural Training Centre (ATC), 5 (5M, 0F) at Eldoret Agricultural Machinery Services Station (AMS), 21 comprising of 9M and 12W are deployed at the six sub county headquarters and 89 (39M, 50W) are deployed at the 30 wards. The extension workers working at the ATC and AMS were excluded from the study population because their mandate does not involve direct interaction with the farmers on daily basis thus the study population was 116 (49 men, 67 women).

According to the 2019 Kenya Agricultural Census, Uasin Gishu County had 130,932 farming households, where 14,403 were women while 116,529 were men.

3.2.3 Sample size

The researcher employed Yamane's (1967) formula, which is a widely recognized statistical method to determine an appropriate sample size especially in a situation

where the total population is known. Applying this formula yielded a sample of 90 respondents, which translated to about 78 percent of the total population, a number deemed sufficiently large enough to produce reliable and precise estimates.

To preserve both representativeness and statistical validity, the researcher employed stratified proportional allocation by deployment level and gender of extension workers. This proportional stratification ensured that the views captured would faithfully reflect those of extension workers across the different deployment levels and gender, thereby enhancing the generalizability of the study's findings. The specific steps of Yamane's (1967) calculation are presented below to illustrate how the sample size was derived.

$$n = \frac{N}{1 + Ne^2}$$

Where, n is the sample size,

N is the population size

e is the level of precision: Substituting in the above formula, the desired sample size for the study was;

$$n = \frac{116}{1 + 116 \times 0.05^2} = 90$$

Extension workers were then clustered according to their levels of deployment/operation to come up with three clusters notably those deployed at the county headquarters, sub-county headquarters and ward level. Thereafter, they were stratified by gender. The sample size, (n), was allocated proportionally by gender to the different strata according to their clusters. Therefore, level of operation/cluster was considered as the i^{th} cluster.

$$n_i = \frac{n \times N_i}{N}$$

Where n_i represents sample size in a given i^{th} cluster, N_i represents population size of the i^{th} cluster and N represents the population size. In my study, $N= 116$; $n= 90$.

Deployment/population size at county headquarters cluster₁ = $N_1 = 6$ (2 men, 4 women).

Sample size through stratified proportional allocation that is i^{th} stratum

$$n_i = \frac{90 \times 6}{116} = 5$$

$$\text{men} = \frac{5 \times 2}{6} = 1.7 \cong 2$$

$$\text{women} = \frac{5 \times 4}{6} = 3.3 \cong 3$$

Sub county headquarters level population size = $N_2 = 21$ (9 men, 12 women)

n_2 = Sample size for sub county cluster

$$n_2 = \frac{n \times N_2}{N} = n_i = \frac{90 \times 21}{116} = 16.3 \cong 16$$

n_2 = sample size for disaggregated strata

$$\text{men} = \frac{9 \times 16}{21} = 6.8 \cong 7$$

$$\text{women} = \frac{12 \times 16}{21} = 9.1 \cong 9$$

Ward level population size = $N_3 = 89$ (39 men, 50 women)

$n_3 = \text{sample size for ward cluster}$

$$n_3 = \frac{n \times N_3}{N} = n_i = \frac{90 \times 89}{116} = 69$$

$n_3 = \text{sample size for disaggregated strata}$

$$\text{men} = \frac{39 \times 69}{89} = 30.2 \cong 30$$

$$\text{women} = \frac{50 \times 69}{89} = 38.7 \cong 39$$

Therefore, the sample size by gender was (3+9+39)=51 women and (2+7+30)=39 men.

3.2.4 Sampling technique and procedure for quantitative data

Using simple random sampling technique, the researcher selected respondents by writing the name of each extension worker on a piece of paper, which was then folded to conceal the name and put in respective buckets according to their strata. The papers in the bucket were thoroughly mixed and then picked until the desired sample size was reached. Simple random sampling gave each case in the population an equal chance of being included in the sample (Singleton, 1993).

3.2.5 Sampling techniques and procedure for qualitative data

During the second phase of data collection, the researcher visited the county agricultural office and requested for the list of farmers according to their respective sub counties. The researcher was provided with a list of 130,932 farmers, where 14,403 were women. She then disaggregated the names of farmers by gender in each sub county and assigned numbers to conceal their identity. Thereafter, numbers were written on pieces of paper, folded and placed in different buckets according to their sub counties and gender. For

the purposes of gender equality, the researcher targeted three women and three men farmers for the qualitative data, where one farmer had to be drawn from each sub county. In order to allocate a farmer to each sub county without gender biasness, the researcher requested an officer from each sub county to come to the county headquarters and participate in the sampling of farmer respondents.

Farmers were included in the study as key informants whose lived experiences offered essential insights into the actual delivery of extension services. Their perspectives provided an independent and practical assessment of whether extension workers demonstrated gender competence during interactions at the community level. Although the quantitative phase focused on extension workers, qualitative input from farmers helped to validate, clarify and enrich the quantitative findings by highlighting how gender-responsive practices played out in real settings. Qualitative data was critical in triangulating quantitative data. Six farmers (three men and three women) were selected through a gender-disaggregated random draw from a verified list of 130,932 farmers across the six sub-counties. This small, balanced and geographically representative qualitative sample is methodologically appropriate, since qualitative inquiry prioritizes depth and context rather than statistical generalization. Their contributions were therefore essential for understanding how extension workers' gender competencies were perceived and experienced at the grassroots level.

To ensure that every sub county had an equal chance of being allocated either gender, the researcher took six pieces of paper and wrote a "1" in three of the papers and a "2" in the remaining three papers. The numeral, "1", represented a sub county that would have a male respondent, while "2" represented the sub county that would have a woman respondent. The researcher then mixed the six pieces of paper in a bucket and asked the

six officers from the sub counties to pick one each. The officers that picked the papers bearing numeral "1" implied that their sub counties had to have a man farmer respondent while those that picked numeral "2" had woman farmer as respondent in their sub counties. After determining the gender of farmer respondents for each sub county, the researcher thoroughly mixed the coded papers in the buckets with the relevant gender. She then picked a paper from each to come up with three men and three women farmers. Hence, Soy, Ainabkoi and Kapseret had woman respondent, while Moiben, Kesses and Turbo sub counties had man respondent. Certainly, the six farmers did not statistically represent the 130,932 farmers; rather, they qualitatively illustrated how gender integration is experienced across the county, complementing and validating the quantitative results.

the farmer respondents were not to be core to the study though but rather they were to be used to gauge the competencies of the extension workers because some evidences could be found on the ground. The selected farmers provided the details needed to corroborate the quantitative data.

3.3 Sources of Data

Data was obtained from both the primary and secondary sources. The sampled ninety extension workers and six farmers contributed to the primary data, while internet, official publications of research institutes, reports from agricultural organizations and the ministry of agriculture constituted the secondary sources of data.

3.4 Research Instruments

A questionnaire and an interview guide were used to collect the data.

3.4.1 Questionnaire

A questionnaire was used as the primary quantitative data collection tool. A total of 99 questionnaires were used, where 90 were filled by the study respondents, while 9 were filled by the pilot study sampled respondents. Since the tool for assessment of capacity in promoting gender equality for the United Nation (UN) System and other partners was not a one-size fits-all standardized questionnaire, the researcher reviewed and customized to suit the study. The researcher consulted the equality and inclusion-reporting template in the Kenya public service sector, which was in line with the available literature on gender responsive agricultural service. In order to add clarity without sacrificing its psychometric properties, Section (3) of the UN system tool, on “Knowledge on gender equality and women’s empowerment” was replaced with “Integration of gender issues into agricultural extension work”. Because the study ended with a call for action, Section (4) dealt with “possible interventions to promote extension workers’ responsiveness to gender issues affecting agricultural productivity”. Thus a modified, customized and validated tool consisting of four sections (Refer to Appendix I) was developed.

The first section of the instrument consisted of six questions, which gathered demographic information of the respondent such as place of work/deployment, age and gender. The second section dealt with educational background and training in gender issues, where the highest level of education and type of course attended was indicated. A binary rating scale consisting of the two possible values “Yes or No” was used to answer the questions; “did your training prepare you to respond to gender issues affecting agriculture?”, “have you received training on gender issues?”. The type of training provided and the provider of the training was stated. The third section of the

questionnaire was concerned with the integration of gender issues into agricultural extension work. A five-item likert scale was used to measure the integration of gender issues into agricultural extension work using a four-point rating scale ranging from “Not at all” to “ a very significant extent”, which was expressed in percentages of total responses.

Although the questionnaire was constructed to collect quantitative data, section four consisted of one open-ended question, which permitted respondents to provide their own opinions and insights regarding call for action. The questionnaire ended with a message of gratitude to the respondents for accepting to participate in the study. The use of questionnaire allowed the researcher to collect data from a large sample population. By using closed-ended items, the questionnaire explored a wide range of issues concerning gender competencies of agricultural extension workers in responding to gender issues affecting agricultural productivity. Hence, the modified questionnaire was found to be suitable for purpose of the study, prevailing circumstances and the participants.

3.4.2 Interview guide

According to UN Women (2014), information gathered using the UN Gender capacity assessment tool could be complemented with more qualitative methods such as interviews, focus group discussions and systematic observations. Moreover, McNamara (1999) indicated that interviews might be useful as follow-up to certain responses to questionnaires. McNamara's opinion is valid today as it was then. It is against this backdrop that the researcher developed an interview guide.

The researcher developed an interview guide (appendix II) by writing down a collection of probing questions. He then regrouped the probes according to the topics and issues required while aligning them to the research objectives. The first question aimed at establishing demographic data of the farmers. This was necessary for understanding the type of farmers participating in the study and their farming activities. Second item of the interview guide looked at access to key productive resources, in particular agricultural land, technologies and trainings. The interview guide ended with a provision for the respondents' opinions on the possible interventions to improve extension service. Six interviews were conducted with key informants and two during the qualitative pilot test.

3.5 Validity and Reliability of Research Instruments

Before collecting data from the respondents, the researcher determined the validity and reliability of the research instruments as explained in the following sub-sections.

3.5.1 Validity of Research Instruments

Face validity for both the customized UN gender equality assessment questionnaire and the interview guide was established by presenting the tools to academic supervisors, who reviewed the clarity, wording, and appropriateness of each item in relation to the study objectives on gender competencies and extension practices. Their feedback ensured that the instruments appeared, on the surface, to measure extension workers' gender knowledge, how they apply it in their work, and possible areas for improvement.

Content validity was determined through an expert assessment in which the supervisors examined whether the questionnaire and interview guide adequately and comprehensively covered all constructs in the study objectives, including gender

knowledge, skills, attitudes and gender integration in extension performance. The interview guide also focused on eliciting information on access to productive resources (land and technology) and access to extension services, thus complementing the questionnaire. Based on the supervisors' evaluation of relevance, alignment and adequacy, both instruments were revised to strengthen their coverage of the key thematic areas.

3.5.2 Reliability of Research Instruments

Reliability of the questionnaire and interview guide was tested through a pilot study. Extension workers serve in specific areas, therefore those sampled for the pilot study were excluded from the main study. Implying that even their deployment areas were not included in the main study. The researcher pilot-tested both the questionnaire and the interview guide for sense, flow and clarity of instructions to gather the desired data in line with the research objectives of establishing gender competence, how it is applied and coming up with actions for improvement. Pilot testing helped establish required time for responses, the possible obstacles could arise in the process and suitability of the tool.

The customized UN System-Wide Gender Equality Assessment Tool is inherently reliable because it is adapted from a standardized instrument that has been widely used across UN agencies to assess gender equality competencies and institutional practices. Its structure, question formats and scoring procedures have undergone extensive refinement, making it consistent and dependable for measuring gender-related constructs. By customizing it to the context of agricultural extension workers while maintaining its original framework, the tool in this study was able to generate stable and consistent responses across similar items, thereby supporting its reliability. In this

regard, reliability test of the interview guide was further done by use of inter rater reliability score as shown;

$$R = \frac{\text{Number of agreements}}{\text{Number of agreements} + \text{number of disagreements}}$$

$$\frac{14}{14 + 2} = 0.875$$

The method assisted in establishing whether the items on the research instruments all reliably measured the same respective constructs. Thus, the instruments were found to be reliable.

3.5.2.1 Pilot testing of the Questionnaire

Piloting of the questionnaire was conducted using a small group of nine extension officers to test clarity, relevance and flow, leading to minor refinements. Although the study adopted the UN gender capacity assessment tool, it had already been validated internationally, providing a strong reliability foundation. Only one section was adapted to focus on integration of gender issues into agricultural extension work, while preserving the tool's original structure and scaling. Reviews by the supervisors confirmed the suitability of the adapted tool. The pilot test further demonstrated that the instrument was clear, context-appropriate and internally consistent. Therefore, the modified tool met reliability requirements even though it was not originally designed for agricultural extension services.

Prior to conducting the pilot testing, the researcher determined the sample size for the pre-test. Connelly (2008) recommended that the sample size for a pilot study be 10% of the sample that was expected for the larger parent study, while Isaac and Michael

(1995) recommended a sample of 10–30 participants and Mugenda and Mugenda (2003) recommended a sample of 3%. The unanimity was that, there were grounds to believe that the size of the pre-test sample varied. Nevertheless, the instrument had to provide data of sufficient quality and quantity to meet the objectives of the study. Nine agricultural extension workers, or 10% of the study population, made up the sample size for the pilot study. The nine respondents were proportionally allocated to the three different deployment areas (clusters), while disaggregating by gender. Using proximate whole numbers, this implied that one female respondent was selected from the county headquarters, two from the sub county headquarters (1W, 1M) and six from the wards (3W, 3M) for the pilot study. The nine respondents for the pilot test were selected through simple random sampling method and they were not to be part of the main study. The researcher and her two assistants held a brief discussion around how the two methods of data collection would be applied to complement each other and for triangulation. In preparation for the study process, the researcher typed and printed the instruments in the form in which they would appear in the collection of data. Pilot testing exercise took two days. Upon arrival to the participants' respective stations, the researchers introduced themselves while building rapport with them. The researchers described the questionnaire including the objectives and purpose of conducting the study to the respondents. Before administering the questionnaires, the researchers obtained a signed consent from the participants.

3.5.2.2 Pilot testing of the Interview guide

Ten per cent of the six farmer respondents, which translated to about one farmer (1M) was engaged in the pilot test for the qualitative data. The respondent for the pilot test

was randomly sampled from the list of farmers and was not included in the main study. He was then interviewed a day after the pilot-test with the extension workers.

3.6 Quantitative Data Collection Procedure

The researcher visited the office of the county director for agriculture (CDA) to inform him of the intended study and to seek for permission to have his staff members participate in the study. Copies of the research permit and authority from National Commission for Science, Technology and Innovation (NACOSTI) were presented to the CDA. After creating a rapport with him, the researcher requested to proceed and deliver the questionnaires to the sampled officers. . Ninety questionnaires were administered to the 90 study population and nine to the pilot study population, with 100% response rate achieved. This indicate full participation from all targeted respondents. The complete coverage eliminates non-response bias and ensures that the data accurately represent the entire study population. Consequently, the findings are highly reliable and strengthen the internal validity of the research.

To each questionnaire, the researcher attached a letter for every prospective respondent, indicating the purpose of the study and value of each response. The letter stressed the confidentiality of responses and indicated that accessibility would only be by researchers and supervisors. The letter informed the respondents that participation would be voluntary. A copy of each letter including a consent form are attached in the Appendix section (appendix III and IV) of this thesis. It was agreed that the researcher would collect the filled questionnaires two weeks later from the CDA's office (Eldoret) and from the sub county headquarters offices notably; Kesses (Kesses sub county), Outspan (Kapseret sub county), Turbo (Turbo sub county), Ziwa (Soy sub county), Moiben (Moiben sub county), Burnt- Forest (Ainabkoi sub county).

The objective of the quantitative data collection phase was to collect information on gender-based training programmes for agricultural extension workers, integration of gender perspectives into agricultural extension work and potential interventions to promote gender-responsiveness in agricultural extension service. Two weeks after the delivery of the questionnaires, the researcher travelled to the county headquarters and all the six sub counties as agreed and collected the completed questionnaires. The 100% response rate led to collection of adequate information that could be generalized to the whole population.

3.7 Qualitative Data Collection Procedure

Having collected data through questionnaires from the core informants, there was need to interview the recipients of extension service to corroborate the extension workers' responses. Appointments for the interviews were made through telephone calls one week before commencement of the qualitative study and as a reminder one day prior to the interview date. The communication was necessary for introduction, to save on time as well as to establish rapport with the interviewee. The participants were explained the reasons for their selection, the purpose of the interview and the study, where, when and for how long the interview was expected to last. Equally, the mode of documentation was explained to the participants.

Before the commencement of qualitative data collection, the researcher recruited two research assistants and trained them. The training covered the background and purpose of the study, sampling procedures, interviewing procedures and techniques. Translation of the research questions from English language to Kiswahili and where possible the local languages was discussed.

The researcher and her assistants visited the farmer respondents at their homes on the interview date. Before commencement of the interview, the researcher obtained written informed consent from all the respondents. The researcher guided the interview while ensuring that questions revolved around the objectives of the study. The face-to-face interview lasted for between 45 and 60 minutes per participant.

During the interview, the researchers recorded the responses comprehensively in their notebooks, while encouraging the respondents to seek for clarification where they felt questions were not clear. The approach yielded 100 percent response and complete answers to all questions. This contributed to statistical accuracy, validity and reliability. Qualitative data collection lasted for two days. Thereafter, follow-up letters of appreciation were sent to all participants after the interview.

3.8 Data Analysis

Both data sets were analyzed sequentially where quantitative data was the first to be analyzed, followed by the qualitative data. Presentation and discussion of the two data sets were merged during the interpretation of the results.

3.8.1 Quantitative Data Analysis

The study adopted a descriptive research design, focusing on assessing agricultural extension workers' gender-related competencies and their influence on gender-responsive extension delivery in Uasin Gishu County. Quantitative data analysis occurred after the collection of the quantitative data. The researcher and her assistants reviewed the responses in the questionnaires for completeness and accuracy. They then coded the responses and entered the data into a computer for analysis. Microsoft Excel was used to analyze the data using descriptive statistics. Tables and charts were used to

present the results while the findings were expressed as frequencies and percentages. The results were then organized and explained based on the study's objectives and research questions outlined in Chapter 1.

Although the conceptual framework suggested the potential use, of mediation analysis to test whether control variables (extension methods, farmers' time and mobility and activity venues) mediate the effect of extension worker competencies on agricultural productivity this was not implemented. The main reason is that the study design was descriptive and not aimed at hypothesis testing. The research aimed at assessing and describing the competencies of extension workers and how gender issues are integrated the main objective here.

Additionally, the study prioritized practical and actionable insights over statistical causal testing. Descriptive and bivariate analyses were therefore sufficient to identify gaps, patterns and priority interventions, aligning with the study objectives. Quantitative data were analysed using univariate statistics (frequencies and percentages) for assessing the levels of gender training and competencies among extension workers, while bivariate analyses (cross-tabulations) explored associations between competencies and integration of gender issues in extension work, with contextualization through control variables.

Analysis by Objective

Objective 1: Determine the training in gender issues received by extension workers Centred on measuring the level of gender knowledge, skills and attitudes (independent variables) of extension workers. Quantitative data were analysed using univariate analysis (frequencies and percentages) to show the proportion of trained vs. untrained

extension workers. Qualitative data from interviews complemented understanding of training gaps.

Objective 2: Examine integration of gender issues into agricultural extension work. Focused on the relationship between extension worker competencies and the extent to which gender issues are incorporated in extension activities. Bivariate analysis (cross-tabulations) was used to explore associations between competency levels and integration practices. Control variables (extension methods, time/mobility constraints, activity venues) were described to contextualize results.

Objective 3: Identify interventions to promote extension workers' responsiveness to gender issues. Focused on recommendations from extension workers and farmers to enhance gender-responsive extension delivery. Data analysed descriptively (frequencies, percentages) to identify consensus on interventions (training, manuals, inclusive scheduling). The descriptive method used provided foundational evidence and practical recommendations for policy and practice.

3.8.2 Qualitative Data Analysis

Qualitative data from six farmers (three men and three women) were analysed thematically to complement and deepen the understanding of patterns observed in the quantitative analysis. Qualitative data was analysed using summative content analysis method. At the end of every day of interviewing, the researcher and her assistants assembled the information received, reviewed the notes and wrote a report.

The researchers created a codebook showing a list of codes and their meanings. They then identified and quantified certain words and content. Coding of the texts was guided by the research objectives and the purpose of the study. For instance, phrases such as

“training activities are normally planned to run the whole day, which compelled women to leave early or arrive late because they had to attend to other responsibilities”, “some training methods, which were employed did not put into consideration the diverse gender interests”. These phrases were coded “Gender integration”.

After coding, the researcher categorized the codes according to similarity in characteristics and gave shorthand codes such as “001”, “002” etc. By analyzing and sorting the codes into categories the researcher was able to detect consistencies and themes for the data. Categories were later summarized into themes, while ensuring that essential aspects of texts were captured and not lost. Themes revolved around answering research questions and therefore aligned to the research objectives.

Microsoft Excel was primarily used for descriptive statistics, but coding, cross-tabulation, and thematic analysis were applied to **integrate quantitative and qualitative findings**, enhancing rigor beyond simple Excel outputs. This approach allowed the study to provide policy-relevant recommendations for enhancing gender-responsive extension delivery.

Each objective was analyzed by systematically linking the independent and dependent variables, along with their corresponding measurement scales and where relevant, the control variables, as summarized in the table below. **Univariate analysis** was conducted to describe individual variables using frequencies and percentages, providing an overview of the distribution of gender training, integration practices, competencies and related characteristics among extension workers. **Bivariate analysis** was applied to examine the relationships between the independent and dependent variables, primarily through the use of cross-tabulations, which helped reveal patterns

in how gender competencies and integration practices varied across different categories of respondents and control variables.

Table 1: Objective-wise Data Analysis

Objective	Independent Variable	Dependent Variable	Measurement Scale	Analysis Type	Control Variables
1. Assess the gender competencies of agricultural extension workers	Training, education, gender awareness	Gender competency score	Ordinal (Likert)	Descriptive statistics (frequency, %); Bivariate correlation	Field exposure
2. Examine the extent of integration of gender issues into agricultural extension work	Extension methods, training frequency	Extent of gender integration	Ordinal (Likert)	Descriptive statistics; Cross-tabulation; % distribution	Deployment
3. Identify interventions to enhance gender responsiveness	Existing strategies, perceived gaps	Proposed intervention areas	Nominal / qualitative	Summative content analysis (coding, theme identification)	N/A
4. Explore farmers' perceptions of gender-responsive extension	Training accessibility, participation, fairness	Farmer perception (themes)	Qualitative	Summative content analysis; Thematic coding	Gender of farmer

3.9 Data Integration

Findings from the qualitative data were embedded into the quantitative findings, while presenting during the discussion of the results.

3.10 Ethical Considerations

The researcher sought for permit and authority from the NACOSTI to undertake the study in Uasin Gishu County (Refer to Appendix V and VI). Equally, the researcher reported to the county commissioner and county director of education for approval before embarking on the research. Further, authority to have extension workers participate in the study was obtained from the county director of agriculture.

Prior to starting data collection, the researcher sent a general letter and questionnaire to each of the sampled extension workers. The letter informed them of the study to be undertaken, the objectives, the methodology to be applied and the accruing benefits if any. Besides the general letter, the researcher attached a written consent to each questionnaire for the participants to sign before filling in the questionnaire. The signed consent ensured that the respondents' participation was out of their own volition.

The researcher informed the sampled farmers of the interview through telephone calling. During the interview day, the researcher sought for the respondents' consent and ensured that each respondent signed the consent letter before the commencement of the interview. After the interview, the researchers appreciated the respondents' participation in the study and assured them that they valued the information they were giving.

After collection of the two data sets, the data was cleaned. Key findings involving tables and graphs are discussed in relation to the existing literature in the next chapter.

CHAPTER FOUR

PRESENTATION, INTERPRETATION AND DISCUSSION OF FINDINGS

TRAINING ON GENDER ISSUES TO EXTENSION WORKERS

4.0 Introduction

The previous chapter presented details on where the study was done, how it was done with whom and when it was done. This chapter presents findings that emerged from analysis and interpretation of data collected against the three specific objectives. It highlights the demographic characteristics of the core respondents (extension workers) and the informants (sampled farmers). The demographic characteristics of the core respondents are age, gender, area of deployment and education. Personal information of key informants collected included; age, gender, marital status, area of residents, type and duration of farming engaged in. Qualitative data was embedded into the quantitative data during the discussion of the findings to triangulate the responses from the core respondents. The chapter discusses training of extension workers on gender issues, integration of gender issues into agricultural extension work and highlights the possible interventions to be considered for the betterment of extension service delivery

a) Age, Gender, Deployment Area and Highest Level of Education of the Respondents

This section presents the respondents' demographic background such as age, gender and deployment area, as shown in Table 2. The interpretation of the research findings required this information as it offered a rough estimate of how representative the respondents were. Table 2 shows the respondents' distribution based on their individual characteristics.

Table 2: Distribution of respondents by age, gender and deployment area

Operation level	Age bracket (years)	W	M	Frequency	Percent
County headquarters	31-40	1	0	1	1.1%
	41-50	2	0	2	2.2%
	51-60	0	2	2	2.2%
	Total	3	2	5	5.5%
S/county headquarters	31-40	2	1	3	3.3%
	41-50	3	4	7	7.8%
	51-60	4	2	6	6.7%
	Total	9	7	16	17.8%
wards	31-40	0	0	0	0.0%
	41-50	16	11	27	30%
	51-60	23	19	42	46.7%
	Total	39	30	69	76.7%
Total		51	39	90	100

The results from Table 2 showed that 90 extension workers participated as the core respondents in the study. Five respondents worked at the county head quarter's office (2M, 3W), 16 at sub-county offices (7M, 9W), while 69 (30M, 39W) served in the wards in Uasin Gishu County. Females constituted most of the respondents at 57% (51), while males were the minority 43% (39). This data was important as there is known perception that most extension officers are males. In the past, agricultural extension jobs were a preserve for males, with a belief that farmers were males (Airemen, 2005).

The study has shown that presently, females are also farmers and they need extension services just as male farmers do, for increased productivity. This may probably have led to the deployment of more female extension workers by the Ministry of Agriculture.

The study sought to find out the age distribution of respondents across the different deployment levels (Table 2) because different ages may have different understanding and experiences of gender aspects.

The results showed that respondents within the age bracket (51 to 60 years) formed the majority at 55.6% (50) with 53% (27) of them being females while 47% (23) of them were males. This was attributed to the fact that before 1990, employment of agricultural extension workers by the government was almost guaranteed. However, after the implementation of structural adjustment programmes in the 1990s, the Kenyan government came under considerable pressure to scale down its dominant role in national economy (FAO 1997). Kenya's agricultural extension budget together with the population of extension workers plummeted significantly (Muyanga and Jayne, 2006). The next dominant category of extension officers are those whose ages range from 41 to 50 years old. They constituted 40% (36), 21W, 15M. This group comprised of extension workers who were sparsely employed towards the end of the 1990s when the government had downsized the employment vacancies in the agriculture sector. The remaining 4.4% (3W, 1M) were below the age of 41 years and composed of those employed between 2008 and 2012.

From the study, it is apparent that most extension workers were elderly and perhaps they had more experience in extension service. They could also be the most appropriate participants to provide data necessary for achieving the study objectives. In addition, the findings showed that majority of the extension workers, 76.7% (69) 39W, 30M were deployed at the ward level, which was the smallest unit of extension work and a place where the closest extension service to the farmers could be found.

In terms of participants distribution by age, majority of the elderly (51-60 years old) extension workers 84% (42), with majority of them 55% (23W, 19M) being females were deployed in the wards. Meanwhile all (4) the youngest generation (31-40 years old) were posted at both the county and sub county offices and hardly in the wards.

From the findings of the study, it can be concluded that deploying the younger generation to the county and sub county levels while assigning elderly extension workers to the wards could leverage the unique strengths of each group for optimal efficiency in service delivery. Younger professionals might be in possession of current technical knowledge, more familiar with digital tools and emerging technologies valuable in headquarters settings where data analysis and knowledge management are central. Whereas, elderly extension workers may typically have long field experience, deep-rooted community relationships and a wealth of indigenous knowledge that is essential for grassroots engagement. Such arrangement could enhance productivity while ensuring that institutional memory is preserved in the field and innovation and modernization are driven from the centre.

Table 3: Distribution of respondents by deployment area, highest level of education and gender

Operation level	Highest educ.	F	M	Frequency	Percentage
County headquarters	P/G(Masters)	2	0	2	2.2%
	Bachelor	1	2	3	3.3%
	Diploma	0	0	0	0.0%
Bachelor	Certificate	0	0	0	0.0%
	Total	3	2	5	5.5%
S/county headquarters	P/Graduate	2	2	4	4.4%
	Bachelor	6	5	11	12.2%
	Diploma	1	0	1	1.1%
	Certificate	0	0	0	0.0%
	Total	9	7	16	17.7
wards	p/graduate	0	0	0	0.0%
	Bachelor	1	0	2	2.2%
	Diploma	20	15	35	38.9%
	Certificate	18	14	32	35.6%
	Total	39	30	69	76.6%
Total		51	39	90	100%

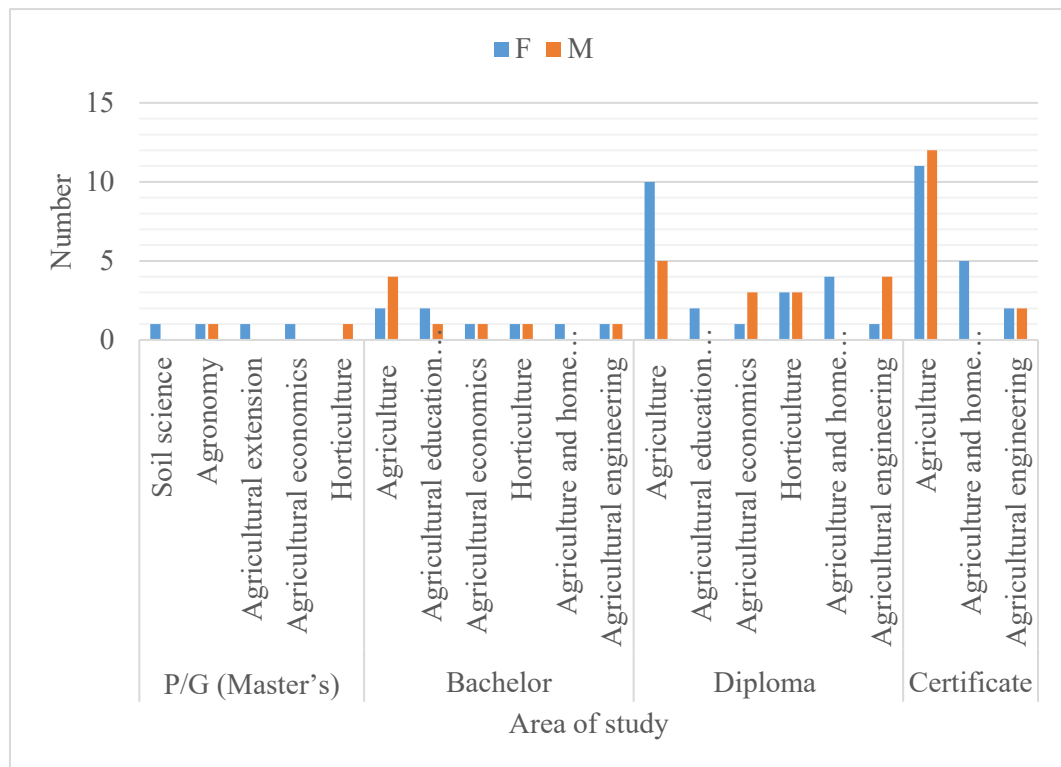


Figure 2: Distribution of respondents by area of study, education level and gender

b) Demographic Characteristics of the Farmer Respondents

Since the study focused on agricultural extension workers' competencies in responding to gender issues affecting agricultural productivity, it was necessary to interview few farmers whose responses would be used to triangulate the self-reported data elicited from the extension workers. In this respect, six farmers comprising of three men and three women were sampled for the interview. The researcher found it necessary to understand the background information of the sampled informants before delving into the content of the qualitative study. Thus, each participant was asked to describe themselves and their day-to-day lives as farmers. The question asked to this effect was;

Please tell me about yourself and your day-to-day life as a farmer.

The farmers described themselves in terms of their names, age, marital status, main farming activity undertaken and duration of practice. For ethical considerations, names

of the farmer respondents were coded to conceal their identity. Farmers' responses are presented in Table 4 as shown.

Table 4: Farmers' general information

Participant code	Sub county	Age (years)	Marital status	Main farming activity practiced	Duration of farming (years)
Male Farmer(MF)1	Kesses	43	Married	Vegetable growing and sheep rearing	10
MF2	Moiben	65	Married	Dairy and maize farming	40
MF3	Turbo	61	Married	Small scale crop and livestock production	37
Female Farmer(FF)1	Soy	48	Unmarried	Poultry and maize farming	10
FF2	Ainabkoi	58	Married	Maize, dairy, poultry, beans and vegetable farming	15
FF3	Kapseret	63	Married	Dairy and maize farming	35

Table 4 shows that of the six farmers interviewed, the oldest was a male age 65 years old with experience of 40 years in dairy and maize farming in Moiben Sub County, while the youngest was a 43-year old male farmer in Kesses Sub County who has been growing vegetables and keeping sheep for the last 10 years. The oldest female farmer interviewed was aged 63 years with farming experience in maize and dairy of 35years and lived in Kapseret Sub County. The youngest female farmer interviewed was 48 years old in Soy Sub County who has done poultry and maize farming for 10 years. Study results also showed that five of the six farmers were married while one female farmer was unmarried.

From the table it is apparent that five out of six farmer respondents (two male and three female farmers) indicated that they grew maize, while 4 (two male and two female farmers) kept dairy animals. Other agricultural activities the respondents were engaged in included poultry farming done by two female farmers, vegetable growing by a male and a female farmer, sheep rearing by a male farmer and beans growing by a female farmer. Consequently, most of the farmers interviewed were engaged in maize farming and dairy cattle rearing, reflecting the primary agricultural activities practiced in Uasin Gishu County. After outlining the basic background information for the two groups of respondents, the following section explored the highest level of education attained by the extension workers and the time of attainment. In seeking to determine the gender training received by agricultural extension workers in the course of their duties, this section also addressed the study's first objective. Furthermore, it examined whether the training adequately prepared them to address gender dynamics within extension services.

4.1 Gender Training of Agricultural Extension Workers

In order to address the first objective of the study, the researcher sought to understand the type of training extension workers possessed. Table 5 shows that extension workers attained their highest level of education later than 1979. The absence of extension workers who acquired their highest level of education earlier than 1980 could imply that perhaps they had exited from service through natural attrition.

The findings of the study indicated that majority of extension workers 26% (23), attained their highest level of education between 1980 and 1989, whereby they studied certificate in Agriculture. Followed by diploma holders in Agriculture at 17% (15) who graduated between 1980 and 2017. Others are those with Bachelor's degree at 7% (6)

attained between 1989 and 2017 and diploma in Horticulture at 7% (6) obtained in 1989 to 1999. Moreover, majority of the Bachelors' degree holders (7) attained their degrees in 2000 to 2009. Despite the advancement in age among extension workers, the study indicated that all the six respondents with master's degree obtained it between 2009 and 2017. This is an indication that majority of them furthered their studies while in service.

Table 5: Distribution of respondents by time of attainment of highest level of education, gender training preparedness and training in gender received at place of work

Education level	Frequency	Time of attainment of highest level of education					Training prepared participant to respond to gender issues		Training in gender received at workplace	
		>1980	1981-1990	1991-2000	2001-2010	2011-2017	Yes	No	Yes	No
PG(Masters)										
Soil science	1					1	0	1	1	0
Agronomy	2					2	0	2	1	1
Agricultural extension	1					1	0	1	1	0
Agricultural economics	1					1	0	1	0	1
Horticulture	1					1	0	1	0	1
Bachelor										
Agriculture	6	0	2	1	1	2	0	6	6	0
Agricultural education & extension	3	0	0	0	3		3	0	3	0
Agricultural economics	2	0	0	1	1		0	2	1	1
Horticulture	2	0	0	0	0	2	0	2	1	1
Agriculture and home economics	1	0	0	0	1	0	1	0	1	0
Agricultural engineering	2	0	0	1	1		0	2	1	0
Diploma										
Agriculture	15	0	7	2	2	4	0	15	10	5
Agricultural education & extension	2	0	2				0	2	1	1
Agricultural economics	4	0	2	1		1	0	4	0	4
Horticulture	6	0	2	1		3	0	6	0	4
Agriculture and home economics	4	0	3	0	1		4	0	4	0
Agricultural engineering	5	0	2	0	2	1	0	5	5	0
Certificate										
Agriculture	23		23	0	0	0	0	23	9	14
Agriculture and home economics	5		5	0	0	0	5	0	5	0
Agricultural engineering	4	0	4	0	0	0	0	4	3	1
Total	90	0	52	7	12	19	13	77	53	37

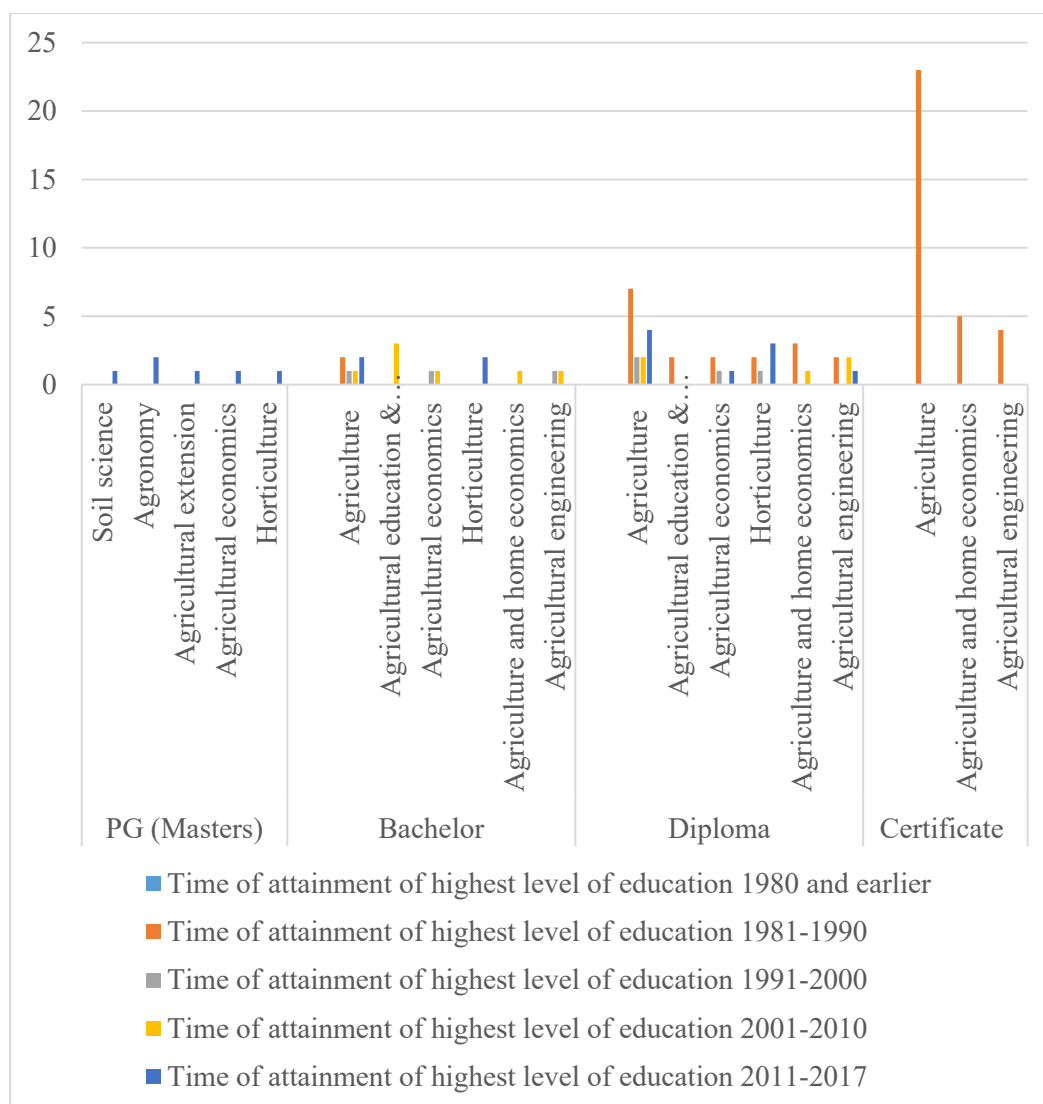


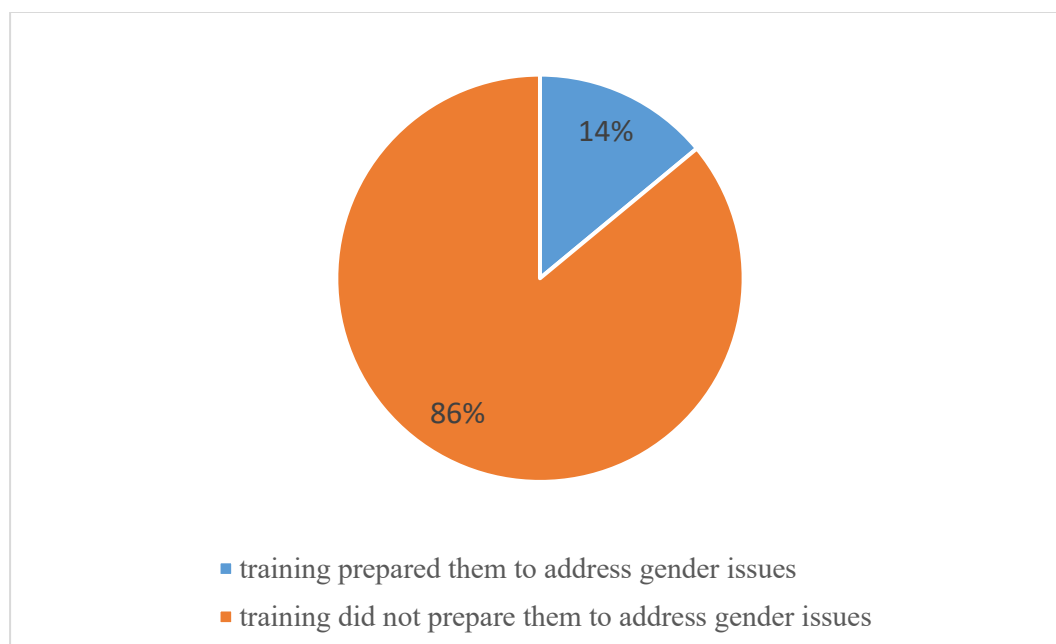
Figure 3: Distribution of respondents by time of attainment of highest level of education

4.1.1 Pre-service Gender Training of Agricultural Extension Workers

As regard to whether the training undertaken by extension workers prepared them to respond to gender issues and whether they had received training in gender issues while in service, the findings are as shown in table 6 and figure 4, and table 7 and figure 5 respectively.

Table 6: Training preparedness to respond to gender issues in agriculture

Training prepared them to respond to gender issues	Training did not prepare them to respond to gender issues
14% (13) (11%(10) Agriculture and home economics) and 3%(3) Agricultural education and extension)	86%(77)

**Figure 4: Training preparedness to respond to gender issues in agriculture**

The findings presented in Table 6 and Figure 4 reveal that only 14% (13) of the extension workers had received gender training during their studies, which equipped them to address gender-related challenges affecting agricultural productivity. In contrast, the majority, 86% (77), reported receiving no such training. Among those who received gender training, 11% (10 respondents) had studied Agriculture and home economics at the bachelor's, diploma or certificate levels. The remaining 3% had pursued Agricultural education and extension.

According to Hendricks and Green (1999), Home economics has historically been a multidisciplinary field largely dominated by women. It was therefore understood to provide extension officers with skills necessary in designing programmes that met the

specific needs of women farmers. This understanding likely influenced the integration of gender content into Agriculture and home economics curriculum. Agriculture and home economics course traditionally focused on both agricultural and domestic responsibilities, roles historically associated with women. As such, it may have naturally incorporated gender dynamics and equipped graduates with relevant skills. Conversely, the integration of gender-related content into other agricultural disciplines has been a more recent and gradual development.

The 3% of extension workers who studied Agricultural education and extension and received gender training graduated between 2000 and 2010, a period marked by increased awareness of gender issues in education. This course may have benefited from national educational policies that promote gender-responsive education (GoK, 2015). The uneven inclusion of gender perspectives across agricultural courses reflect a mix of historical, social, professional and academic factors. Addressing this disparity requires deliberate efforts to recognize the relevance of gender issues in all agricultural disciplines, including those traditionally perceived as purely technical. Respondents who studied agronomy, agricultural engineering, agricultural economics and horticulture at the bachelor's level or lower and those with master's degrees in soil science, agronomy, agricultural extension, agricultural economics and horticulture reported that their courses did not prepare them to respond to gender issues. These qualifications were attained between 2010 and 2017, suggesting that many agriculture-related curricula during this period lacked gender-inclusive content. The absence of gender training in technical disciplines such as agricultural engineering may have stemmed from a focus on technical competencies, where gender concerns were deemed irrelevant.

According to Mashumah and Chamami (2021), integrating gender into curricula requires lecturers who are not only aware of gender equality but also committed to inclusive and anti-discriminatory practices. A lecturer's awareness and attitude toward gender perspectives greatly influence the delivery of gender-responsive education. However, lack of gender sensitivity in education is not solely due to individual's attitude. Structural and systemic barriers including rigid curricula, limited resources and lack of gender-focused research may contribute to the slow integration of gender perspectives. Moreover, standardized curricula, in particular, may leave little room for innovation or contextual adaptation to include gender-responsive content.

Analyzing the specific curriculum content undertaken by respondents could have provided deeper insights into how gender issues were integrated at different training levels. However, the primary focus of the study was to assess the gender-responsiveness of extension workers in practice, rather than conducting a curriculum audit. While curriculum variations across institutions and time likely influenced the respondents' preparedness, examining these curricula in detail fell outside the study's scope and design.

Even so, the study clearly highlighted the need for evidence-based advocacy by demonstrating significant gaps in gender training among extension workers. These findings underscore the importance of using data and research to inform future curriculum reforms aimed at embedding gender-responsive approaches across all agricultural training programmes, thereby strengthening the effectiveness of extension services. Consequently, the study provides a strong foundation for policy actors to consider a more comprehensive review of agricultural training curricula in subsequent research or reform initiatives.

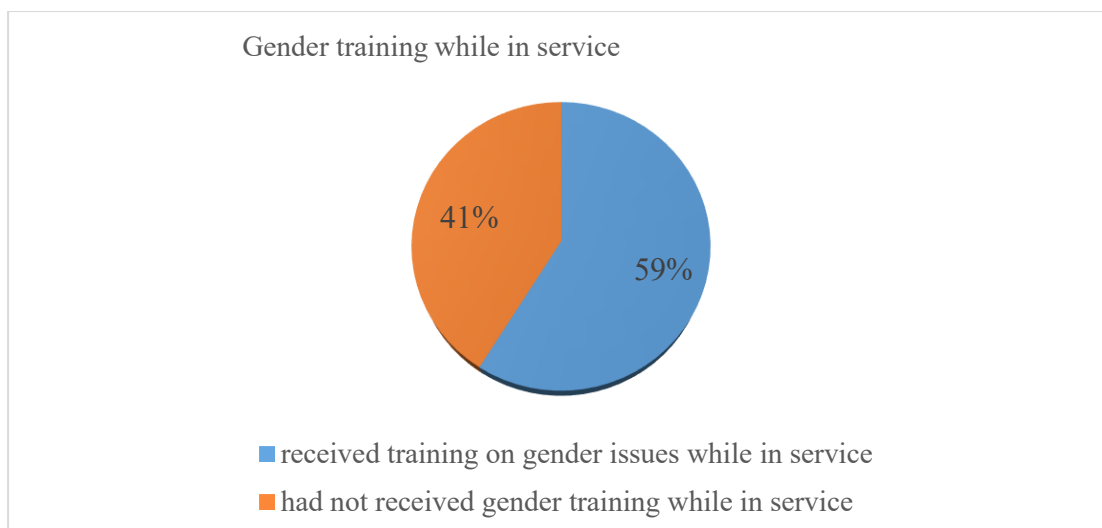


Figure 5: Respondents who received training in gender issues while in service

Table 7: Extension officers who received training in gender while in service

Received training in gender while in service	Had not received any training in gender while in service
58.9% (53)	41.1% (37)

4.1.2 In-service Gender Training of Agricultural Extension Workers

The finding that most gender training was delivered through donor-funded programmes such as SWCP, NALEP and ASDSP underscores a structural weakness: gender capacity strengthening is not fully institutionalized within government systems.

This reliance on external programmes is misaligned with the Agricultural Sector Transformation and Growth Strategy (ASTGS 2019–2029), which calls for sustained capacity building for frontline extension staff and prioritizes gender-responsive approaches as a driver of agricultural transformation. Public service norms on continuous professional development similarly require that competencies essential to service delivery such as gender integration be embedded within routine government-led training frameworks rather than dependent on externally funded initiatives.

The historical context of the NALEP gender-mainstreaming guide (2010), which was never operationalized due to programme closure and the shift to devolved governance, further demonstrates the fragility of donor-dependent training models. The lack of continuity contradicts policy directions in the Agricultural Policy (2020) and the Livestock Policy (2019), both of which emphasize mainstreaming gender and strengthening institutional capacity across the entire extension system. The transition to county management should have created an opportunity for counties to institutionalize gender training; however, the findings suggest that Uasin Gishu did not fully embed these requirements in its extension training structures during the post-devolution period.

From the study results, it is apparent that agricultural extension workers' competencies in addressing gender-based constraints were significantly shaped by their academic background, year of graduation and exposure to gender training. Only a small proportion (14%) mainly those trained in Agriculture and Home Economics (11%) and Agricultural Education and Extension (3%) had received structured gender training while in college, and these were mostly graduates from 2000–2010, a period when gender modules were integrated into agricultural education and extension programmes. In contrast, the majority of extension workers were trained in technical agriculture courses that traditionally excluded gender content, resulting in limited awareness of how gender roles, power relations, and differentiated access to resources affect service delivery. Although 59% had received gender training through donor-funded programmes, such opportunities were short-term and project-bound, meaning the acquired skills were not consistently reinforced within government extension systems. The remaining 41%, who had never received any gender training, represented a

significant competency gap in the extension workforce. Collectively, these disparities demonstrate that gender competency among extension workers is uneven and largely dependent on chance exposure through specific courses or donor projects rather than systematic professional development. Because extension workers with inadequate gender understanding may overlook women's time constraints, mobility challenges, technology needs, and land access barriers, the quality and inclusiveness of extension service delivery is compromised. This ultimately translates into a gendered productivity gap: farmers especially women receive less relevant support, adopt fewer technologies, and experience lower yields. Therefore, the study shows that weak gender-responsive competencies among extension workers directly limit agricultural productivity by perpetuating unequal access to extension services between men and women.

The inadequacy and inconsistency of gender training point to a clear capacity gap that has implications for the county's alignment with national development commitments, including Medium Term Plan IV (2023–2027), which prioritizes gender equality, agricultural transformation and improved service delivery. Strengthening gender training both at pre-service and in-service levels would ensure that extension officers meet national expectations for gender-responsive practice and enhance the county's ability to deliver equitable, inclusive and productivity-enhancing extension services. This requires shifting from donor-reliant models to institutionalized, government-led training integrated into routine professional development.

4.2 Integration of Gender Issues into Agricultural Extension Work

The study sought to establish the status of integration of gender issues into agricultural extension work. In this study, "gender issues" refer to the practical and strategic factors that shape how male and female farmers access, participate in and benefit from

agricultural extension services. Specifically, the analysis focused on four core dimensions of gender responsiveness in extension work: Differences in access to land, which directly affect farmers' decision-making power and ability to adopt technologies. Second, equitable access to agricultural technologies, acknowledging that women often face structural, financial and informational barriers limiting uptake. Third, gender-sensitive planning of extension activities, including timing, venue and scheduling, which may disadvantage women due to their disproportionate domestic and caregiving responsibilities. Fourth, consideration of gender-specific preferences and constraints when selecting extension methods, ensuring that training approaches are accessible to both men and women. The study also examined how overall gender concerns influence extension workers' day-to-day service delivery.

Together, these issues capture the extent to which extension officers recognize and respond to gender-based disparities, thereby determining the inclusivity and effectiveness of agricultural extension services in Uasin Gishu County. The findings from the quantitative and qualitative data are presented in Table 8 and Table 9 respectively. Both data sets are integrated during interpretation and discussion of the results.

Table 8: Integration of gender issues into agricultural extension work

Gender issue		Not at all	To a limited extent	To a significant extent	To a very significant extent
To what extent do you consider access to land by male and female farmers during extension service delivery?	Freq.	8	38	44	0
	%	8.9%	42.2%	48.9%	0%
To what extent do you advocate for technologies to be equally accessible to females as much as they are to male farmers?	Freq.	47	34	9	0
	%	52.2%	37.8%	10.0%	0%
To what extent do you take into account females and male farmers' needs with regard to timing (time of day, day of week and period of the year) and venue when organizing for agricultural extension activities?	Freq.	43	39	8	0
	%	47.8%	43.3%	8.9%	0%
To what extent do you take into account females and male farmers' needs with regard to choose of agricultural extension methods when organizing for agricultural activities?	Freq.	40	42	8	0
	%	44.4%	46.7 %	8.9%	0%
To what extent do gender concerns influence your extension work?	Freq.	13	55	22	0
	%	14.4%	61.2 %	24.4%	0.0%

In order to triangulate the information reported by the extension workers, the researcher interviewed six selected farmers. The interview focused on gender access to land and agricultural technologies. In addition, the farmers were asked to explain how their gender needs, in regard to timing (time of day, day of the week and period of the year), extension methods and venue when organizing for agricultural extension activities were considered by the agricultural extension workers. The following were farmers' responses:

Table 9: Gender access to agricultural land, technologies and extension services

Respondent code	Gender access to Land	Gender access to agricultural technologies	Convenience of time and venue for agricultural extension activities to male and female farmers	Convenience of extension methods used to male and female farmers
MF1	Men control and access land while women access mainly for subsistence farming	-Farmers access technologies through farmer trainings, field days, community development meetings, agricultural shows, exhibitions, trade fairs, seminars, internet, publications, mass media such as TV and radio and social media especially WhatsApp. More male farmers compared to female farmers attended most of these activities -Male farmers purchase tools and products from agro dealer shops	-Farmer trainings are scheduled to take whole day and many men avail themselves for the trainings -Often men prefer trainings that are held in a classroom set up where those who wish to take notes can conveniently do so.	-Extension workers use different extension methods to pass knowledge to farmers. -Extension workers decide on the type of method to use and only inform the farmers to participate. -In case of farmer trainings, male farmers prefer condensed f training is where they can learn a lot at the same time. -Male farmers also have preference for exhibitions, field days, farmer tours and residential trainings, such as those where they are booked in a Farmers' training centre away from home because they concentrate better. -It is common for men to source agricultural knowledge from mass and social media
MF2	Men control and access land while women access but cannot control	Farmers learn about tangible (hard) and intangible (soft) technologies from extension workers and/or access through trainings, field days and seminars. However certain farm equipment come at high cost for both male and female farmers while others are difficult/cumbersome to be used or operated by women	-Extension workers organize for agricultural activities, which often run for a whole day with more male than female farmers attending	-When extension workers are organizing for open-farmer forums such as agricultural shows exhibitions /trade fairs, field days, they involve stakeholders at planning and preparation stages and often many male farmers attend such fora as they are likely to get chance to interact freely with their peers and exchange ideas -Farmer-to-farmer extension method is preferred by men if both are men
MF3	Men control and access land while women access only. Land is usually handed down the lineage of male children(sons)	men get chance to attend to opportunities such as trainings, field days, TV and radio programmes, which offer various technologies -Men also learn about innovations and practices technologies from their fellow men especially those of the same social status or higher	-Public extension service is unbiased and guided by government policies, however it is not readily available	-Decision on the type of extension method employed by extension workers is top-down. Extension workers decide on the method they want to use be it on-farm demonstrations, field days and so on. -Although some activities such as agricultural shows are organized at a higher level, with extension workers as stakeholders, extension workers encourage farmers to take advantage of such opportunities to enhance their agricultural knowledge

Respondent code	Gender access to Land	Gender access to agricultural technologies	Convenience of time and venue for agricultural extension activities to male and female farmers	Convenience of extension methods used to male and female farmers
FF1	In men-led households, the men have control of the land and access varies from household to household. In women-led households, they access and are able to control	Knowledge on innovations and good agronomic practices are accessed from farmer trainings and field days. Tangible technologies such as some farm tools and equipment are too costly for women to purchase, while others are designed in a way, which cannot be comfortably used by women	-Farmers in the interior villages are rarely reached because extension workers hold activities at venues near highways or where the road network is good - Agricultural extension programmes are scheduled to run for a whole day making women either to arrive late or leave early because of other competing responsibilities	-It is the extension workers prerogative to choose the type of extension methods they want to employ in reaching the farmers -More female farmers prefer practical oriented extension methods because they can easily apply on their farms what they learn. They also prefer group discussions or farm visits due to mobility constraints or time limitations occasioned by household responsibilities. -public extension services are primarily geared towards male farmers, often to the exclusion of female farmers
FF2	Men control and access land while women are allowed to access and even establish kitchen gardens if they so wish	Extension service offered is biased towards male farmers for instances the technologies promoted such as large farm machinery and ICT are either expensive or are designed for men-use only in terms of cost and frame. Some farmers learn technologies from others.	Extension workers do not consider farmers' convenience of time. At times, they plan for activities that take a whole day forgetting that female farmers have household chores to perform. Extension activities held on certain days of the week such as market days or during festive seasons like December holidays attract low turnout	-Some extension methods used prevent participation of women, for instance during agricultural tours most women are either not allowed by their husbands to attend or the domestic workload such as child-care and household chores cannot allow them to be away. - Some on-farm demonstrations are gender-typed in their design and implementation. For instance banana planting and irrigation of crops using "money maker" are not gender-friendly
FF3	Both male and female farmers access land though it is mainly controlled by men	Knowledge on agricultural technologies such as good agronomic practices is mainly learnt from neighbours	Farmer trainings are held in far places requiring a lot of time for travelling and participating, this hinders women attendance	-Public extension services are generally geared towards giving advisory support to male farmers. -Most female farmers prefer individual farm visits because they get an opportunity to interact directly with an extension worker and share the issues they would like addressed. Given time constraints faced by many female farmers, farm visits are a preferred extension method due to their time efficiency

4.2.1 Differences in Access to Land

Table 8 shows that 48.9% (44) of extension officers considered gender access to land to a significant extent, while 42.2% (38) considered it to a limited extent and 8.9% (8) did not consider it at all during extension service delivery. Qualitative findings (Table 9) revealed that men farmers predominantly owned land, while women farmers mostly accessed land through husbands, fathers or sons. One 61-year-old male farmer noted,

“Men control and access land while women access it only because land is usually handed down the lineage of male children (sons).”

These findings contrast with policy expectations, particularly the Constitution of Kenya (2010), which guarantees equality in property ownership (Article 27), and the ASTGS (2019–2029), which calls for equitable access to productive resources. By demonstrating a persistent policy-practice gap, the study highlights the need for practical improvements such as gender-aware extension programmes, community sensitisation on land rights and dialogue facilitated by extension workers.

Cultural norms especially patrilineal inheritance remain a significant barrier. Although some unmarried women and female household heads owned small plots, control largely remained with men. As one unmarried 48-year-old female farmer shared,

“In male-led households, the male farmers have control over land and access to it varies from household to household. In addition, female farmers in female-led households, have control over land. In my case, I am a single lady therefore I have access to and control over my land”.

This supports arguments by Kituo cha Sheria (2022) and Balasha (2022) that most women still access land through male relatives.

Nearly half of extension officers considering land access to a significant extent indicates moderate gender responsiveness, showing recognition of unequal tenure

systems and their implications for extension uptake. However, the other half either showed limited or no consideration at all, signalling weak integration and the need for continuous sensitization.

Although stakeholders were not directly interviewed, this study brings them in indirectly through extension workers, who are well-positioned to engage with relevant actors addressing constraints to gender integration in agriculture. In line with the Constitution of Kenya (2010), public service plays a coordinating role across sectors, and extension officers can facilitate dialogue between communities and authorities, demonstrating the benefits of new ideas within cultural contexts. They can also collaborate with local administrators and opinion leaders to gradually shift perceptions and behaviours toward more productive and inclusive agricultural practices, illustrating how multiple actors shape integration outcomes. According to Diaz and Najjar (2019), adopting holistic approaches enables governments and extension systems to address deep-rooted cultural barriers. Limited integration of land concerns ultimately affects productivity because land ownership and control determine who receives information, adopts innovations and invests in long-term improvements.

4.2.2 Equitable Access to Agricultural Technologies

Agricultural programmes introduce new technologies, such as farming practices, machinery, tools and equipment to the farming communities. In this aspect, the researcher sought to find out if extension workers advocated for new technologies to be equally available and/or accessible to both male and female farmers (Table 8). In response, 52.2% (47) indicated that they did not at all advocate for equal access to new technologies, 37.8% (34) stated that they advocated to a limited extent while 10% (9) reported that they advocated to a significant extent.

Having a significant proportion, (52.2%), of extension workers failing to advocate for equal gender access to agricultural technologies could be attributed to inherent gender biases and stereotypes occasioned by how the society positions men as the heads of households and primary decision-makers. These norms may influence extension workers to focus more on male farmers and view female farmers as support roles. Affecting both technology flow and adoption Findings show weak integration in promoting gender-equitable access to technologies.

Farmers access technologies through trainings, meetings, field events and by learning through the media. However, more men than women access high-level and costly technologies as reported by a 61-year-old male farmer,

"farmers learn about technologies from trainings, TV and radio apparently more male than female farmers attend such trainings, while new technologies come with a substantially high cost, which most women cannot afford".

Findings of the study further show that the high cost of technologies significantly contributed to their inaccessibility by women. Affordability strength coupled with training are crucial for technology adoption.

Several tools were reportedly not user-friendly for women. The study extends this by showing that gender bias begins at design level, where women's physical capabilities and roles are not considered. These findings align with UNCTAD (2020), which emphasises that agricultural technology is gendered from design to dissemination. CGIAR's redesign of the bean thresher in Tanzania (Gadeberg & Lecoutere, 2023) demonstrates how stakeholder engagement from researchers to extension workers can improve gender responsiveness.

Limited advocacy weakens feedback loops between female farmers and technology developers, affecting policy-level integration by failing to inform inclusive technology standards. Practically, the absence of gender-responsive technological support restricts women's productivity, adoption of innovations and potential to contribute fully to household and county agricultural output.

4.2.3 Consideration of Gendered Time and Mobility Constraints in Extension Planning

Regarding the timing (time of day, day of the week, time of year) and the choice of venue for agricultural extension activities (Table 8), 47.8% (43) of the extension workers indicated that they did not put into account the needs of female and male farmers at all when determining the timing and location of these activities. In addition, nearly 43.3% (39) of respondents reported that they considered male and female farmers' needs to a limited extent. This implied that a large majority of extension workers insufficiently responded to the different constraints occasioned by gender-based time poverty affecting farmers' agricultural productivity. Nevertheless, only 8.9% (8) of extension workers reported considering male and female farmers' time and venue needs to a significant extent, indicating a concerning inadequacy of inclusivity in extension service provision. This demonstrates limited integration in planning extension activities.

Given that nearly half (47.8%) of the extension workers did not take into account the time constraints of male and female farmers suggested that many farmers whose schedules did not align with the allocated times likely missed out on agricultural extension services. Study findings reveal that female farmers had competing responsibilities such as household chores. A situation that placed them at a disadvantage

in accessing extension services. This highlighted the need for extension workers when organizing for agricultural activities to take into account the overall daily commitment of time and energy required by female farmers.

Failure to acknowledge female farmers' busy schedules, which may have prevented them from attending agricultural extension activities such as trainings, field days and demonstrations, raises concerns about the effectiveness and inclusivity of these activities. This concern is reflected in the views of four interviewed farmers (2 M and 2 F). For instance, a 48-year-old female farmer stated,

"Agricultural extension programmes are scheduled to run for a whole day, making women either arrive late or leave early because of other competing responsibilities".

Similarly, a 65-year-old male farmer supported this sentiment, noting,

"Extension workers organize farmer trainings that often run for the whole day and many male farmers attend unlike female farmers."

This aligns with Yadav and Preethi (2024), who observed that rigid extension schedules disproportionately exclude women. The duo acknowledged the existence of competing priorities in the farming realm and suggested that extension programmes should be adaptable to changes in social, economic and environmental situations. For all to gain valuable knowledge necessary for enhancing agricultural productivity. This could imply that the timing of extension activities might have been convenient to most male farmers but may not have adequately accounted for the time constraints faced by female farmers. Therefore agricultural extension workers need to understand male and female farmers' roles and daily schedule of activities to come up with timings convenient to both male and female farmers.

Besides the time of day, the day of the week also affected farmers' participation. For instance, a 58-year-old female farmer reported,

“Extension activities held on certain days of the week such as market days or during festive seasons like December holidays attract low turnout”.

This suggests that time is of the essence to farmers as much as it is to extension service delivery. Farmers have other important obligations such as market days and festive events, which may demand their attention. Poorly timed extension activities are therefore likely to attract low turnout.

Hence, there is need to consult with farmers and align extension activities with their availability to avoid scheduling conflicts. Where the time preference for farmers and extension service delivery is considered, maximum participation is likely to be realized. This argument highlights the need for further researcher to determine the extent to which market days and festive seasons affect the participation of both male and female farmers in agricultural extension activities.

The choice of venue for agricultural extension activities was equally critical as it affected the total time an attendee would be away from home. This is evident in a 63-year-old female farmer who stated,

“Trainings are held in far places requiring a lot of time for travelling and participating, this constrains women attendance”.

The long travel time needed to attend agricultural programmes takes up a significant portion of the day, posing a barrier to those with limited free time. As shown in Table 9, female farmers were more affected by distant venues due to competing responsibilities. When female farmers failed to attend because of responsibilities that

could not allow for long distance-travel, then they missed out on services that could improve their productivity and efficiency.

This observation (Table 9) is consistent with findings by Medendorp et al (2022) who argued that women in Bangladesh often did not participate in locally organized extension programmes due to time conflicts with daily responsibilities and the cultural norms that discouraged or limited their presence in public places, especially away from home.

Further complexity around venue choice was highlighted by a 48-year-old female farmer who observed that,

"farmers in the interior villages are rarely reached because extension workers hold activities at venues near highways or where the road network is good."

The limited geographical coverage by extension workers occasioned by infrastructural and logistical barriers may pose time and cost challenges especially to female farmers residing in remote or interior villages. This highlights the need to factor in the time participating farmers must spend away from home where most of their responsibilities lie. The findings pointed to a notable gap in the integration of gender-responsive planning and targeted interventions in agricultural extension activities.

These barriers point to weak integration at practice level and limited translation of policy expectations into field operations. Poor alignment between extension schedules and farmers' availability reduces female attendance, narrowing their access to knowledge and lowering adoption of innovations ultimately reducing productivity.

4.2.4 Consideration of Gender Needs in Extension Methods

The researcher inquired about the extent to which extension workers considered female and male farmers' needs when choosing the type of extension methods to use. Table 8 shows that, 44.4% (40) of extension workers indicated they did not at all take into account female and male farmers' needs with regard to the choice of extension methods employed. About 46.7% (42) stated that they took into account female and male farmers' needs to a limited extent when choosing an extension method. Furthermore, 8.9% (8) mentioned that they took into account female and male farmers' needs to a significant extent. From the farmers' interviews, three (2M, 1W) of them opined that extension workers decided on their own the type of extension methods to employ when disseminating knowledge to farmers. These farmers' responses reflected those of the 44.4 % extension workers who reported not taking into account at all male and female farmers' needs when choosing extension methods to use. A case in point is a 43-year-old male farmer who shared

“extension workers decide on the type of method to use and only inform the farmers to participate”. “Decision on the type of extension method employed by extension workers is top-down. Extension workers decide on the method they want to use be it on-farm demonstrations, field-days and so on” said a 65-year-old male farmer.

Further, a 48-year-old female farmer noted that,

“it is the extension workers' prerogative to choose the type of extension methods they want to employ in reaching the farmers”.

In situations where open-farmer-fora such as exhibitions, trade fairs/shows, field days and on-farm trials were used to disseminate knowledge to farmers, stakeholders were involved from the planning stage according to a 65-year-old male farmer. However, qualitative results showed that more male than female farmers attended the open-farmer fora. Involving stakeholders in the preparation of open-farmer fora could support the

view expressed by 46.7% (42), who indicated that they considered the needs of both female and male farmers only to a limited extent when selecting an extension method. This limited consideration is evident in instances where more male than female farmers were reported to have attended open-farmer fora, such as agricultural shows, despite stakeholders being involved in the planning of these activities. This raises questions about the type of stakeholders engaged in the planning, preparation, and organization of such fora. If more male than female farmers participated in open-farmer fora, it may suggest that the organizers did not adequately consider the differing roles and responsibilities, access to resources and mobility constraints that influence gender participation. Consequently, this points to limited gender responsiveness in the planning process. Suggesting that stakeholder engagement was not gender-sensitive. This raises questions about which stakeholders were included, and how their decisions influenced participation patterns. In this regard, further research is necessary to examine the selection and role of stakeholders involved in the planning of open-farmer fora.

Apart from having involved stakeholders in organizing open-farmer-fora activities, which might not have been satisfactorily gender-inclusive, the results of the qualitative data maintained that social norms and domestic responsibilities hindered some female farmers from participating in agricultural programmes. As explained by a 58-year-old female farmer;

“some extension methods used prevent participation of women. For instance, during agricultural tours most women are not allowed by their husbands to attend while others are held up with child-care work and other house chores”.

Over 90% of agricultural extension workers either failed to consider, or considered only to a limited extent, the needs of both male and female farmers when organizing agricultural activities. This suggested that they neither recognized nor responded to the

underlying systemic inequities. As a result, already disadvantaged female farmers were further marginalized through use of inconvenient extension methods, limiting their access to agricultural services. According to a 48- and a 63-year-old female farmer, extension service was primarily male-focused. Implying that gender-integration was insufficient during extension service delivery.

A study by Bhusal and Karki (2022) in Kathmandu, Nepal, indicated that different gender-related barriers required proper address based on female farmers' needs and skills. From this observation, it was evident that Bhusal and Karki advocated for affirmative action in support of female farmers. The study aligns with Bhusal and Karki (2022), who emphasize participatory approaches for women. The study acknowledges gender-based constraints and seeks to understand the level of inclusivity in the strategies.

Participants from the qualitative study also shared their preferred extension methods.

For instance, a 43-year-old male farmer contended,

“men prefer attending exhibitions, field days, farmers’ tours and residential trainings, such as those where they are booked in a farmers’ training centre away from home because they concentrate better”.

He added

“it is common for men to source agricultural knowledge from mass and social media”.

However, a 63-year-old female farmer noted that women preferred individual farm visits, as these allowed for direct interaction with extension workers and provided personalized attention. In addition, such visits were seen as effective in accommodating women's time constraints. Female farmers also found focus group discussions appealing, likely because these settings offered a supportive platform for sharing

experiences and ideas. This preference aligns with findings by Bhusal and Karki (2022), who observed that participatory approaches promote a sense of ownership and enhance adoption rates.

Moreover, both male and female farmers indicated a preference for practical extension methods, suggesting that hands-on approaches enhanced understanding and ultimately implementation of the acquired knowledge. By acknowledging the different preferences of male and female farmers in extension methods, extension workers can adopt approaches that are both responsive and effective for each gender.

The extension methods cited by farmers in this study align with those outlined in the Kenya Agricultural Sector Extension Policy (KASEP, 2022), which highlights exhibitions, tours, farm visits, exchange visits, trade fairs and adaptive on-farm trials as common approaches. However, KASEP (2022) also acknowledges that some of these methods fall short in addressing crosscutting issues, such as gender inclusivity. The findings of the current study reinforce this concern. For example, a 58-year-old female farmer described certain demonstrations such as banana planting and the use of "money-maker" irrigation pumps as gender-unfriendly. Extension methods that systematically exclude one gender not only compromise equity but also restrict access to vital agricultural services.

These findings show low practice-level integration, echoing KASEP (2023), which acknowledges that many extension methods insufficiently address gender inclusivity. When methods do not accommodate women's needs, access to knowledge becomes unequal, reinforcing productivity gaps.

4.2.5 Influence of Gender Concerns on Extension Work

From the findings in Table 8, 14.4% (13) of the extension officers indicated that gender concerns did not influence their work at all, while 61.1% (55) noted limited influence. Only 24.4% (22) reported a significant influence. The small proportion who perceived no influence suggests minimal awareness or appreciation of gender dynamics, possibly reflecting persistent stereotypes that define a farmer primarily as a male household head. This finding reflects long-standing social norms highlighted by Mudege et al. (2017) that result in women farmers being overlooked despite their active engagement in agricultural production. Qualitative evidence from this study, including the case of a 48-year-old unmarried female farmer seeking extension services, reinforced the fact that traditional assumptions no longer reflect current farming realities.

The finding that women's roles in agriculture are often undervalued aligns with Sullivan and Russo (2016), who observed that women's contributions especially in subsistence production are frequently undercounted. The comparison also shows that rigid cultural norms continue to shape how extension workers interpret gender roles, sometimes leading to the exclusion of both women and men whose activities fall outside socially prescribed expectations. Yet, as Sullivan and Russo (2024) also note, subsistence production is equally important for household food security and thus requires technical support from extension workers.

The majority (61.1%) who reported limited influence may represent those who acknowledge gender issues but do not systematically incorporate them into practice. This suggests partial integration and mirrors Diaz and Dina's (2019) warning that agricultural productivity gains will remain constrained if gender is not fully integrated into extension practice. Limited integration may also be linked to weak training

systems, inadequate institutional support or absence of strong gender mainstreaming structures at county level. The 24.4% who reported significant influence were likely beneficiaries of donor-funded programmes or specific gender-capacity development initiatives such as the ASDSP programme, which promoted gender-responsive value chain development.

The findings show that integration of gender issues at practice level remains inconsistent. At the policy level, Kenya's key agricultural frameworks including ASTGS 2019–2029, Agricultural Policy (2020), Livestock Policy (2019) and Kenya Vision 2030 provide clear directives for gender equality in access to land, technology and extension services; however, these commitments have not fully translated into practice. At the operational level, gender integration was assessed by examining whether extension workers actively considered gender-differentiated needs when planning and delivering services. Stakeholders beyond farmers and extension workers such as county departments, donor programmes and community groups were implicated through their influence on training availability, resource allocation and extension priorities.

The study demonstrates that inadequate integration of gender issues weakens the effectiveness of extension services by limiting women's and some men's access to resources, opportunities and technologies that enhance productivity. Conversely, when gender considerations are well integrated, extension programmes become more inclusive, relevant and impactful, thereby improving the county's overall agricultural performance. The findings therefore point to a need for stronger capacity-building, deliberate gender-responsive planning and alignment of practice with existing national policy commitments to ensure equitable and effective extension service delivery. Having

described the status of gender integration in agricultural extension service, the following section highlights possible interventions, which may contribute to addressing the mentioned constraints.

4.3 Possible interventions to promote extension workers' responsiveness to gender-based challenges affecting agricultural productivity

The study employed a sequential transformative mixed-method design, driven by a change-oriented motivation and culminating in a call for action. In this regard, the researcher sought the participants' opinions on how the competencies of agricultural extension workers to identify and respond to gender-based challenges, could be improved. Opinions of participants from both the quantitative (Table 9, 11, 12) and qualitative data (Table 10) were considered.

4.3.1 Training on Gender Issues

All the core participants 100% (51W, 39 M) suggested that they needed sensitization and training on gender perspectives. They identified the areas to be trained on in gender as; gender power relations, gender roles/responsibilities and access to productive assets, recognition of gender needs and gender analysis tools. The findings regarding area of focus in gender training are presented in Table10.

Table 10: Need for training and sensitization of extension workers on gender

Area of focus suggested	Number of officers who	
	Suggested	Did not suggest
Gender relations and how they influence agricultural productivity	90 (100%)	0(0%)
Greater awareness of gender differences in roles and access to productive resources and services	71(79%)	19(21%)
Better understanding on how to recognize specific needs of male and female farmers	90 (100%)	0(0%)
Training on gender analysis tools	90 (100%)	0(0%)

Table 11: Farmers' suggestions to improve extension service

Respondent code	Interventions to help extension workers identify and respond to gender-based challenges
MF1	Extension workers to ensure services and products offered are current
MF2	Extension workers to be constantly trained to equip them with new knowledge
MF3	-Extension workers to come up with interventions suitable to all demographics doing practical farming be they men or women. -Extension workers to promote technologies that consider the end-user
FF1	Equip extension workers with knowledge and skills on how to enhance meaningful participation of women in agricultural production
FF2	Extension workers should encourage couples to attend farmer trainings and field demonstrations together.
FF3	Extension workers purpose to encourage women to participate in trainings by holding trainings closer to their homes. The trainings should take short periods.

While gender is essential in understanding the context of implementing agricultural extension, both quantitative and qualitative data sets confirmed that gender was often not adequately integrated. The results from the quantitative data showed that all 100% (90) extension workers required sensitization and training on gender aspects. From the qualitative data, (Table 11) two out of six respondents called for constant training of extension workers to equip them with new knowledge. As evident in a 48-year-old female farmer response,

"equip extension workers with knowledge and skills on how to enhance meaningful participation of women and men in agricultural production".

Not to mention a 65-year-old male farmer who reported that

"extension workers be constantly trained to equip them with new ideas".

There is need for increased training and awareness programmes, which can help extension workers understand the importance of gender issues and their impact on agricultural productivity. The areas of focus in gender training and proportion of extension workers in need according to the quantitative data are presented in Table 10.

Training on gender relations

All the extension workers (100%) needed training on gender relations and how they influence agricultural productivity, how to recognize specific needs of male and female farmers and gender analysis skills. Seventy-nine percent required training on greater awareness of gender differences in roles and access to productive resources and services.

Having all extension workers (100%), proposed training on gender relations and their influence on agricultural productivity implied that extension workers were aware of the distinct needs and constraints faced by male and female farmers, which affected agricultural productivity. This highlights the need for proper guidance on understanding cultural norms and practices that shape expectations and power dynamics within the communities or households. As a 65-year-old, male farmer reported *"extension workers to come up with interventions suitable for all those doing practical farming be they men, women or youth"*. Understanding gender relations enables extension workers to reach a broader audience, ensuring that female farmers who often play crucial roles in

agriculture but may be overlooked, receive the support they need. However, implementing gender-responsive interventions may cause changes in established power relations within households and communities. Perhaps this explains why a 58-year-old female farmer suggested that couples should be encouraged to attend farmer trainings and field demonstrations together. Knowing who does what and the decision makers in a community or household would help extension workers to design programmes that meet the needs of both male and female farmers leading to increased productivity. The call by a female farmer to target couples for farmer trainings and demonstrations could pave way for more inclusive and collaborative approaches involving both male and female farmers.

Training on gender access and roles disparities

Further, training on greater awareness of gender differences in roles and access to productive resources was suggested by 79% of extension officers, while 21% did not see the need for such training. In many communities, men and women play distinct roles in farming and have unequal access to resources. Most extension workers expressed the need to understand these disparities to effectively respond to gender-related constraints. The roles could be performed either concurrently or at different times/seasons. For instance, during land preparation, more male farmers might require to be trained on maize-planter calibration to ensure they get maximum maize yields for sale, while female farmers could be interested on establishment of indigenous vegetables for household food security. Knowledge on gender roles help extension workers to improve their targeting and plan accordingly for when to provide relevant and effective advice and support.

Being aware of gender disparities in access to resources enables extension workers to advocate for and implement more equitable resource distribution strategies. They can foster inclusive participation in agricultural activities, ensuring that male and female farmers are served at convenient time and venue using relevant extension methods. The 21% who did not require the training on greater awareness of gender differences in roles and access to productive resources might have felt that they already had the knowledge. Moreover, cultural norms could be influencing their perception on the importance of such an area in training. Understanding the gender roles can help extension workers to provide relevant services based on the distinct responsibilities and unequal access to resources.

Training on gender needs

Another area of interest in training was to better understand and recognize specific needs of male and female farmers emphasized by all the 90 extension workers (100%). This suggestion was corroborated by the sentiments of a 61-year-old male farmer who opined that extension workers should promote technologies that take into account the end users' needs and capacities. In addition, a 63-year-old female farmer urged extension workers to hold trainings closer to their homes, while ensuring that they take short periods in order to encourage female attendance. The fact that 100% extension workers expressed the need to understand and recognize gender specific needs implied that male and female farmers faced different and unique challenges. Therefore, highlighting the need for tailored services to gender needs.

Training on gender analysis tools

All extension workers (100%) suggested that they required training on gender analysis tools. When a gender analysis tool is used to guide in understanding gender-specific

barriers to access of resources, extension workers may ensure through advocacy and lobbying, equitable distribution of agricultural resources. More importantly, with gender analysis tools, impact of agricultural extension on different genders can be monitored and evaluated. In addition, gender analysis tools can inform tailored interventions leading to improved productivity for both male and female farmers. With proper training, extension workers can offer more gender-responsive agricultural services to male and female farmers for improved agricultural productivity.

4.3.2 Gender Training Manuals

Apart from the need for training and sensitization on gender concerns, some extension workers indicated that they required training manuals on gender perhaps to help them have a common understanding on gender integration in extension services. The results of their opinions are as shown in Table 12.

Table 12: Extension workers who require gender training manuals

Needed to be provided with gender training manuals	Did not need to be provided with gender training manuals
80% (72)	20% (18)

Eighty per cent of extension workers (40W, 32M) proposed that they needed a training manual on gender. Extension workers have not been satisfactorily gender-responsive in their delivery of services. This shortfall could be attributed to inadequate guidelines on how to put into practice gender knowledge. To effectively integrate gender into extension service provision, agricultural extension workers need a common understanding of what gender integration into extension services entails. The gender-training manual should be structured to provide both theoretical knowledge and practical skills. These manuals should be comprehensive to cover a range of topics and practical approaches. A training manual in place will offer structured training content,

which will act as a mechanism for systematic integration of gender issues into agricultural extension work. When a significant majority (80%) of extension workers reported a strong need for gender training manuals, the implication could be that most extension workers felt underprepared to address gender integration effectively. The 20% who did not require training manuals could imply that they may have acquired gender knowledge through other avenues. They could have been among the extension workers who had the chance to work in programmes that promoted gender integration in extension. It is also possible that they may not have internalized the gravity of the gender knowledge gap in them.

The overwhelming support for training manuals on gender integration among extension workers signified a crucial step towards gender-responsiveness in agricultural extension services. By addressing this need, extension workers can ensure that both male and female farmers receive the support they need, ultimately contributing to increased agricultural productivity.

4.3.3 Transport Facilitation

The third possible intervention, which the extension workers suggested was on transport facilitation (Table 13). Majority of extension workers (78%) indicated that they needed to be provided with transport logistics such as motorcycles and fuel by their employer to be able to reach farmers in their localities.

Table 13: Extension workers need for transport facilitation

Needed to be provided with transport logistics (motorcycles, fuel)	Did not require transport
78% (70)	22%(20)

This intervention may address the concerns raised by farmers regarding the choice of venue and timing for agricultural activities. With adequate transport facilitation, the mobility of extension officers would be improved, enabling them to meet farmers at venues closer to their homes. Bringing services closer to farmers and reducing the time required for such engagements could not only encourage women's participation but also help them save time that would otherwise be spent traveling long distances. Such arrangements would consider women's demanding schedules, which often revolve around domestic responsibilities.

The findings demonstrate a strong and consistent need for targeted interventions to enhance extension workers' responsiveness to gender-based challenges in agricultural productivity. Both quantitative and qualitative data revealed that extension workers feel inadequately prepared to address gender disparities, with all respondents identifying a need for comprehensive training on gender relations, gendered roles and access to resources, recognition of gender-specific needs and application of gender analysis tools. Farmers reinforced this view, emphasizing the importance of equipping extension workers with updated knowledge, practical gender-responsive skills and approaches that facilitate the meaningful participation of both men and women. The high demand for gender training manuals (80%) further highlights gaps in practical guidance for integrating gender into daily extension work. Additionally, the request for improved transport facilitation reflects structural barriers that limit the ability of extension workers to reach farmers especially women in accessible, convenient locations. Collectively, these findings underscore that building gender-responsive capacity requires not only training but also institutional support, operational tools and logistical resources to ensure equitable and effective extension service delivery.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter summarizes the study findings, presents conclusions and outlines recommendations for policy and further research.

5.1 Summary

The aim of the study was to understand the competencies of agricultural extension workers in responding to gender-based constraints affecting agricultural productivity. The first objective determined the training in gender received by extension workers either in college or on the job. The findings highlighted a significant gap in their preparedness to respond to gender issues.

The study established that agricultural extension workers' competencies in responding to gender-based constraints were significantly shaped by their academic background, year of graduation, and exposure to gender training. Only a small proportion (14%) mainly those trained in Agriculture and Home Economics (11%) and Agricultural Education and Extension (3%) had received structured gender training while in college, and these were mostly graduates from 2000–2010, a period marked by increased awareness of gender issues in education sector and education policies that promoted gender-responsive education.

In contrast, the majority of extension workers were trained in technical agriculture courses that traditionally excluded gender content, resulting in limited awareness of how gender issues affect agricultural productivity.

While 59% of extension workers reported, receiving gender training primarily through donor-funded programmes the sustainability of that knowledge was often limited to the duration of the projects. Rendering long-term integration of gender issues weak. The remaining 41% of extension workers who lacked any form of gender training further contributed to a persistent gap, limiting the overall effectiveness of extension services in responding to gender-related agricultural constraints.

Nearly half (49%) of agricultural extension workers reported taking into account gender differences in access to land during service delivery, suggesting awareness of how unequal land access affected male and female farmers' productivity. However, an equal proportion either did not consider or only partially considered this issue, indicating a gap in gender-responsive extension services. While male farmers often benefitted from customary privileges of acquiring land, women generally accessed land through use rights mediated by male relatives, although some shifts such as fathers granting land to unmarried daughters are emerging.

About 48% of extension workers partially to significantly advocated for equal access to agricultural technologies by male and female farmers against 52% who did not advocate at all. In addition, certain technologies were inaccessible due to high cost and/or design bias.

Nearly half of the extension workers (48%) did not consider gender-specific needs at all regarding the timing and venue for holding agricultural activities. Only a minority 9% and 43% took into account male and female farmers' needs when choosing the time and venue for agricultural activities, to a significant and limited extent respectively. This oversight compounded the challenge of low participation.

Extension workers used a range of methods such as field days, farm demonstrations, farm visits and agricultural shows when delivering services to male and female farmers. However, 44% did not consult farmers on their preferred methods. While 9% of extension workers significantly considered gender-specific needs, 46% gave only limited consideration, potentially leading to partial inclusivity. Both male and female farmers preferred practical methods, though women tended to favour farm visits, while men preferred open-farmer fora. An indication that gender integration into extension work was generally low.

The study found that while a majority of extension workers (61%) acknowledged a significant influence of gender concerns on their work, a substantial proportion either reported limited (24.4%) or no influence at all (14.4%). Despite growing awareness, gender issues are not yet fully integrated into extension service delivery.

Training was identified as a key possible intervention to the low integration of gender issues into extension work. Four key areas of training in gender were identified namely; gender relations and how they influence agricultural productivity, greater awareness of gender differences in roles and access to productive resources and services, better understanding on how to recognize gender-specific needs of male and female farmers and training on gender analysis tools. Other possible interventions include provision of gender training manuals and transport logistics such as motor cycles and fuel by the employer to enable extension workers increase geographical coverage.

5.2 Conclusions

The study set out to assess the competencies (knowledge, skills and attitudes) of agricultural extension workers in Uasin Gishu County in responding to gender issues

affecting agricultural productivity. The findings demonstrate that extension workers' competencies remain uneven and insufficiently developed, particularly in areas requiring deeper analytical understanding of gender dynamics affecting agricultural productivity. This directly addresses the overall objective by showing that current capacity levels are inadequate for delivering gender-responsive extension services, thereby constraining productivity outcomes for both male and female farmers.

The study concludes that gender training among extension workers is limited, inconsistent and largely superficial. Only 14% had received any form of pre-service gender training, while 86% entered the profession without foundational preparation to understand or address gender dynamics. Most officers (59%) reported receiving only short, project-based sensitizations rather than structured, comprehensive gender training. As a result, knowledge-based competencies such as understanding gender norms, resource-access disparities and intra-household decision-making patterns remain weak. The take-home message emerging from these findings is that without systematic and continuous gender training, capacity gaps will persist, limiting the ability of extension workers to diagnose gender constraints or tailor methods to farmers' differentiated needs.

The level of gender integration across all four dimensions examined; access to land (48.9%), access to agricultural technologies (10%), gendered time and mobility constraints (8.9%) and gender needs in extension methods (8.9%), was low to moderate. This indicates extension workers' knowledge of gender disparities is partial, their skills in applying gender-responsive approaches are limited and their attitudes still reflect traditional assumptions that privilege male farmers, thereby weakening integration efforts.

The conceptual framework, which positioned gendered needs as influencing the effectiveness of extension methods, is validated by evidence showing that when methods, timing and venues fail to reflect gender-specific realities, adoption and participation decline, thereby affecting productivity.

These findings clearly show that gender issues are only marginally integrated into agricultural extension work, thus falling short of the expectations of the ASTGS (2019–2029), KASEP (2023), the Constitution of Kenya (2010) and other policy frameworks that require equity in provision of services including agricultural extension.

The findings demonstrate that limited integration is not simply a procedural gap but a competency gap. Some extension workers recognized some gender disparities particularly regarding land and women's competing domestic responsibilities but lacked the skills to translate this awareness into gender-responsive planning, technology dissemination or method selection. Attitudinal barriers, including the persistent view of the farmer as predominantly male, further constrained their ability to serve both genders equitably. Thus, the results confirm that the competencies required to respond to gender issues affecting productivity are fragmented, confirming the overarching conclusion that extension workers' capacity to mainstream gender is inadequate for the demands of modern agricultural extension practice.

In regard to promotion of gender responsiveness in extension, the findings clearly demonstrate that the limited responsiveness observed throughout the study is a direct reflection of gaps in competencies: knowledge, skills and attitudes required to effectively identify and address gender-based constraints faced by male and female farmers. Consistent with the overall research objective, the assessment showed that

while extension workers are central to bridging productivity gaps, their existing competencies are inadequate for gender-responsive service delivery. This conclusion is grounded in the overwhelming and unanimous call for gender-focused training, practical tools and operational support that emerged from both quantitative and qualitative data.

The results show with precision and clarity that 100% of extension workers lacked adequate knowledge on gender relations, gendered roles, access disparities and recognition of gender-specific needs, confirming that their competency gaps are substantive and affect their capacity to deliver equitable agricultural services. Equally, the unanimous request for training on gender analysis tools reflects an explicit need for skill-based competencies to diagnose and respond to gender barriers systematically. The strong demand by 80% of the workers for gender training manuals further underscores gaps in practical guidance indicating that even where awareness exists, extension workers lack structured direction on how to convert gender knowledge into actionable extension practice. Additionally, the call for transport facilitation (78%) revealed that weak logistical support undermines extension workers' attitudes and ability to reach farmers equitably especially women highlighting the institutional dimension of competency.

The study's conclusions are strongly aligned with the Gender Transformative Theory, which emphasizes shifting norms, attitudes and institutional structures to achieve equitable outcomes. The observed structural and skill gaps validate the theory's argument that change may be fostered through change in individual capacities such as knowledge, skills and attitude. The theory promotes institution integration of, making gender responsiveness an embedded component of all organizational functions rather

than an afterthought. The study is also consistent with the pragmatic paradigm and the conceptual framework, which guided the examination of training, integration practices and interventions as interacting components influencing gender responsiveness. The findings confirm that competencies (knowledge, skills, attitude), when strengthened, enhance responsive extension service delivery, thereby validating the framework.

It is emerging from the study findings that gender-responsive extension cannot be achieved without deliberate, structured and institutionalized training systems. Competency does not arise spontaneously; it must be systematically cultivated. The gender training gaps identified constitute a primary bottleneck in achieving equitable and productivity-enhancing extension outcomes in Uasin Gishu County.

The contribution to knowledge inherent in this study lies in providing empirical evidence grounded in both quantitative data and qualitative insights that the absence of gender-focused training is the single most critical weakness in the extension system's ability to respond to gender issues affecting productivity. While previous literature has highlighted the importance of gender mainstreaming, this study offers concrete, context-specific data on the extent of gender training gaps among frontline extension workers, how these gaps emerged historically and why they persist despite progressive policy reforms. It is one of the few studies to explicitly map training histories, analyze discipline-specific curricular limitations and link them to on-the-ground competency deficits. Ultimately, the assessment confirms that the competencies of extension workers were effectively examined and the results clearly show that their preparedness for gender-responsive extension remains inadequate. Without strengthening gender training at both pre-service and in-service levels, extension workers will continue to struggle in addressing gender-based constraints that reduce agricultural productivity.

The findings therefore call for an urgent shift from donor-dependent, episodic training to structured, government-led and curriculum-embedded gender capacity development that aligns with national policy expectations and supports sustainable agricultural transformation.

5.3 Recommendations

The study recommends, at the practice level, that the State Department for Crop and Livestock Development at the county institutionalize continuous, structured gender-responsive capacity building for all extension workers. This recommendation directly arises from the finding that 86% of officers had no formal gender training, while only 14% received any training during college, and that most relied on short-term donor-funded sensitizations whose impact diminished when projects ended. Establishing annual in-service gender training integrated into routine extension programming will equip officers with the knowledge, skills and attitudes required to identify gender constraints, apply gender-analysis tools, and reach diverse farmer groups effectively. Such sustained capacity building will reduce dependency on external projects and directly strengthen frontline extension practice, thereby responding to the first specific objective on training received.

To complement capacity-building efforts, the study further recommends the standardization of gender-responsive extension approaches across all wards. The findings showed that gender integration was inconsistent and dependent on individual officer commitment or project presence, resulting in unequal access to information, technologies and opportunities for male and female farmers. Developing county-wide Standard Operating Procedures (SOPs) that specify gender-balanced mobilization strategies, inclusive scheduling of activities and use of mixed or gender-specific

training groups will ensure uniformity and fairness in service delivery. This recommendation is firmly anchored in the second specific objective, which sought to determine the extent of gender integration into extension work. By providing clear operational guidance, these SOPs will make gender responsiveness a routine practice rather than an optional or interest-driven activity, improving the quality and equity of agricultural extension across Uasin Gishu County.

At the policy level, the study recommends that the Ministry of Agriculture and Livestock Development, in collaboration with universities and TVET institutions, integrate mandatory gender modules into all agricultural training curricula, including technical programmes such as Agronomy, Agricultural Engineering and Economics. This recommendation is justified by the finding that only Agriculture & Home Economics and Agricultural Education & Extension included gender content, leaving the majority of graduates with no preparation in gender issues. Addressing curricular gaps is essential for developing long-term gender competencies and ensures alignment with national policy frameworks such as ASTGS (2019–2029), the Agricultural Policy (2020), the Livestock Policy (2019), Vision 2030, and MTP-IV, all of which emphasize gender equality in agricultural productivity. This recommendation directly contributes to building a pipeline of gender-competent professionals and supports the third specific objective, which sought to identify interventions that enhance responsiveness to gender challenges.

Additionally, the study recommends that the County Government and the State Department for Crop and Livestock Development institutionalize monitoring and accountability mechanisms for gender-responsive extension. The findings indicated that gender integration was not monitored, meaning policy intentions were not

translated into practice. Introducing gender-responsive indicators such as the proportion of women reached in trainings, the inclusion of gender analysis in extension plans and gender-disaggregated reporting of technology adoption will make gender mainstreaming measurable, actionable and enforceable. Such mechanisms will bridge the gap between national gender policies and county-level implementation, ensuring that gender responsiveness is not aspirational but operational.

At the research level, the study recommends a comprehensive curriculum audit of agricultural training institutions to examine how gender is integrated across programmes and to identify barriers to curriculum reform. This recommendation is informed by observed curriculum disparities among extension workers and the need for evidence to support policy reforms in agricultural courses. Future research should document the depth, frequency and pedagogical approaches used to teach gender across institutions, thereby generating data that can guide national curriculum reviews and strengthen gender competence at the pre-service level.

6.4 Suggestions for Further Research

Based on the findings, methodological limitations and scope of this study, the following areas for further research are recommended. First, since this study did not systematically examine the content of agricultural training curricula, future research should conduct a comprehensive audit of universities and TVET programmes to assess how gender is integrated across courses. Such studies will clarify the sources of competency disparities observed among extension workers and inform curriculum reforms.

Second, given the cross-sectional design of this study, longitudinal research is needed to track the long-term impact of gender-responsive training on extension workers' knowledge, skills, and attitudes, and how these, in turn, influence farmers' access to services, adoption of technologies and overall agricultural productivity.

Third, further studies should apply mixed-method or experimental approaches to evaluate the effectiveness of specific gender tools, such as time-use analysis, gendered technology access mapping and household decision-making diagnostics, in improving gender integration within extension work. Finally, research should explore institutional and cultural barriers including workload, resource constraints and organizational incentives that hinder sustained gender mainstreaming in extension departments, as these emerged in the study's findings but could not be fully examined due to time and resource limitations. Addressing these areas will provide deeper empirical evidence to strengthen gender-responsive extension practices and inform policy and training interventions.

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APPENDICES

Appendix 1: Consent Form

Title: *Gender-Responsiveness in Agricultural Extension Service Delivery: An Assessment of Extension Workers Competencies in Uasin Gishu County Kenya*

Thank you very much for accepting to participate in the study. A questionnaire will be used to gather important information about your individual capacity to respond to gender issues affecting agricultural productivity in Uasin Gishu County. Your responses will provide very useful information, which will be used to determine future training needs and extension approaches. The information gathered will only be used for this purpose. Thank you in advance for your anticipated honest response. You will have an opportunity to include your comments and suggestions at the end of the questionnaire but you can also send comments to my supervisors or to me.

Purpose of Study: The aim of the study is to assess agricultural extension workers' competencies in responding to gender issues affecting agricultural productivity in Uasin Gishu County, Kenya.

The specific objectives are to:

Determine the training in gender issues received by agricultural extension workers in Uasin Gishu County.

Examine the integration of gender issues into agricultural extension work in Uasin Gishu County.

Identify interventions to promote agricultural extension workers' responsiveness to gender issues affecting agricultural productivity in Uasin Gishu County.

Potential Risks and Discomforts: There are no potential risks or discomforts involved in participating in the study. Just answer the questions asked in the questionnaire. The information volunteered will not jeopardize your job. Should some questions become difficult to answer, you are at liberty to seek clarification from me or to pass the question. Be rest assured that you are not obliged to respond to what you are not comfortable with.

Potential Benefits: There are no direct personal benefits for those participating in the study. However, the information gathered will be used to guide gender-training needs. I believe your responses will assist in generating information that can be used to design a training curriculum/manual on gender competence in agricultural extension and may offer suggestions on policy formulation on gender inclusion in agricultural extension packages.

Confidentiality: All the information you provide will be confidential and the researchers and the supervisors will only know your identity.

Compensation: You are requested to voluntarily participate in the study. There is no compensation attached and you are at liberty to accept or reject the request to take part in the study.

Informed Consent

I have read the above information and I agree to participate in the study.

Signature of participant: Date:

If you have any questions or other comments on the study, please contact me using my cell phone line: 0723707355 or e-mail address leahboit@gmail.com OR the office of DVC Academic research and extension at Moi University.

Appendix 2: Questionnaire

Respondent's identification number..... Place of interview.....

Date of interview.....

Introduction

My name is Leah Boit. I am a postgraduate student in the Department of Sociology, Psychology and Anthropology at Moi University. I am conducting a study whose aim is to assess the gender-responsiveness in agricultural extension service delivery: an assessment of extension workers competencies in Uasin Gishu county Kenya. You have been chosen to participate in the study. Responses to the questionnaire are anonymous and confidential. We will gather important information to take stock of extension workers' gender competence in responding to gender-based challenges affecting agricultural productivity. Your responses will provide useful information in determining gender-training needs among agricultural extension workers. The information gathered through this questionnaire will only be used for this purpose. We thank you for accepting to participate and in the most complete way possible. You will have an opportunity to include your comments and suggestions at the end of the questionnaire but you can also send comments to me by email.

If you have any questions or other comments on this study, you are free to raise them. Thank you for agreeing to participate in the study and welcome. Filling the questionnaire will take approximately 30-45 minutes.

Gender-Responsiveness in Agricultural Extension Service Delivery: An Assessment of Extension Workers Competencies in Uasin Gishu County Kenya

Gender equality capacity assessment tool from UN System-wide action plan - customized to suit the situation under study and adapted

Section 1: General Information

The objective of this section is to collect general information from all respondents on:

Please, fill in the following table.

Organization.....

Duty station.....

Operation level

Age

Sex

Section 2: Educational background and training in gender issues

The objective of this section is to determine the highest level of education attained by the respondent and the training in gender issues received.

For each educational level completed, please specify year and area of study:

Educational level	Year	Area of study
Certificate		
Diploma		
Bachelor/undergraduate		
Post graduate		

3. Apart from your technical training, did your training prepare you to respond to gender issues in agriculture? Yes No

4. Have you received training on gender issues in agriculture while in service?

Yes

No

If your answer above is yes, please, indicate the type of training and the organizers/providers of the training.

Section 3: Integration of gender issues into agricultural extension work

The objective of this section is to examine integration of gender issues are integrated into agricultural extension work.

a) Access to land by male and female famers

To what extent do you consider access to land by male and female farmers during extension service delivery?

Not at all	
To a limited extent	
To a significant extent	
To a very significant extent	

b) Access to technologies by male and female farmers

To what extent do you advocate for technologies to be equally accessible to females and male farmers?

Not at all	
To a limited extent	
To a significant extent	
To a very significant extent	

c) Gender consideration for time and venue for agricultural activities

To what extent do you take into account females and male farmers' needs with regard to timing (time of day, day of week and period of the year) and venue when organizing for agricultural activities?

Not at all	
To a limited extent	
To a significant extent	
To a very significant extent	

d) Gender consideration when choosing extension methods

To what extent do you take into account females and male farmers' needs with regard to choice of extension methods?

Not at all	
To a limited extent	
To a significant extent	
To a very significant extent	

e) Influence of gender concerns on extension work

To what extent do gender concerns influence your everyday work?

Not at all	
To a limited extent	
To a significant extent	
To a very significant extent	

Section 5: Possible interventions to promote agricultural extension workers' responsiveness to gender issues affecting agricultural productivity in Uasin Gishu County.

What do you recommend to improve your competencies in responding to gender issues that affect agricultural productivity?

.....
.....
.....

Please share any thoughts or comments that you think might be useful.

.....
.....
.....

Thank you for your cooperation and for taking your time to complete the questionnaire on Gender competence in extension service.

Appendix 3: Interview Guide

Respondent's identification number..... Place of interview.....

Name of interviewer.....Date of interview.....

Introduction

My name is Leah Boit. I am a postgraduate student in the Department of Sociology, Psychology and Anthropology at Moi University. I am conducting a study whose aim is to assess the gender-responsiveness in agricultural extension service delivery: an assessment of extension workers competencies in Uasin Gishu county, Kenya

You have been chosen to participate in the study. Interview responses are anonymous and confidential. I will gather important information on gender access to productive resources in your community and the quality of extension service from a gender perspective, which you receive from extension workers. Your responses will provide useful information, which will be used to improve extension service delivery. The information gathered through this interview will only be used for this purpose. We thank you for accepting to participate and in the most complete way possible. You will have an opportunity to include your comments and suggestions at the end of the interview.

If you have any questions or other comments on this study, you are free to raise them. Thank you for agreeing to participate in the study and welcome. The interview will take approximately 30 minutes.

Gender-Responsiveness in Agricultural Extension Service Delivery: An Assessment of Extension Workers Competencies in Uasin Gishu County Kenya

1. General information

Please tell me about yourself and your day-to-day life as a farmer.

Section 2: Integration of gender issues into agricultural extension work

1. Tell me about access to land in your community

2. Please explain to me about access to agricultural technologies.

How would you describe consideration of time (time of day, week and year) and venue by extension workers when organizing for agricultural activities in your locality?

d) How about extension methods employed by extension workers?

Section 5: Possible interventions to promote agricultural extension workers' responsiveness to gender issues affecting agricultural productivity in Uasin Gishu County.

In your own opinion, how can gender competence of agricultural extension workers be improved? _____

Thank you for your cooperation and for taking your time to participate in the interview.

Actions as per the Institutions' Performance Contract 2013/2014	Max score (%) [100]	Annual Target (%)	Quarter achievements						Cumulative achievement for the year						Actual annual variance in (%)	
			Actual achievements						Actual annual achievements							
			Total	Sex		Persons with disability	Age category			Total	Sex		Persons with disability	Age category		
M	F	<35		35-59	60+		M	F	<35		35-59	60+				
1.2 Baseline and benchmark on compliance level with the 2/3 gender representation policy on appointments, employment and promotions in the public services as per the constitution																
1.3 Baseline and benchmarks measuring progress of the number women-led, youth-led and PWDs-led enterprises accessing 30% public procurement tender opportunities																
1.4 Proportion of ministerial sectoral plans subjected to sex disaggregated benefit incidence analysis	1.4.1 Sex Disaggregated Data Available		1.4.2 Has data informed MDA planning and programming showing evidence of added value of interventions to men and women?						1.4.2.1 Explain (in bullet form)							
	Yes	No	Yes			No										

Mainstreaming actions as per the Institutions' Performance Contract 2013/2014	Max score (%)	Target for contract period in (%)	Quarter achievements						Cumulative achievement for the year						Actual annual variance in (%)		
			Actual achievement						Actual annual achievements								
			Total	Sex		Persons with disability	Age category			Total	Sex		Persons with disability	Age category			
				M	F		<35	35-59	60+		M	F		<35		35-59	60+
1.5 Workforce: Total number of employees																	
1.5.1 % of employees by sex, PWD, and age group																	
1.5.2 Of all employees, % in job group M and above																	
1.5.3 Of all employees, % promoted to job group M and above																	
1.5.4 Number of persons on internship program																	

N/B: For all data on PWDs, indicate the sex and age.

Status of Implementation of Mainstreaming Actions as per current year Performance Contracting Guidelines (attach progress reports and copies of evidence of work done where applicable)											
Name of policy	Max score	Does the MDA have the following policies or strategies		Has relevant activities of this policy been included in the 2013/2014 annual work plan		What percentage of total budget was allocated to these mainstreaming activities	What percentage of total budget was actually spent on the mentioned activities	Support structure			
								Does the institution have __machinery (dedicated staff/committee)		Have the dedicated staff/committee received relevant training (refresher) on the policy?	
		Yes	no	Yes	No			Yes	No	Yes	No
1.6 Development and implementation of the ministerial policy in line with the National Gender and Development Policy to guide the gender mainstreaming activities (<i>attach copy</i>)											
1.7 Development/implementation of a work place policy on Gender based violence (<i>attach copy</i>)											
Please highlight some of the emerging issues or challenges faced in the process of mainstreaming and integrating principles of gender equality and freedom from discrimination in your institution.											
I certify that the report submitted to the National Gender and Equality Commission is accurate. Submitted to NGEC, P.O. Box 27512-00506; Tel 020-272 7778; Email: pcontracting@ngeckeny.org CC: tnyambura@ngeckeny.org and genderdcc@gmail.com											
Name of reporting officer		Designation			Telephone Number		Email address		Date		

N/B: All reports should be submitted to NGEC by the 15th day of the month succeeding the ended quarter. A copy of the report to be submitted to directorate of gender, Ministry of Devolution and Planning

Appendix 5: NACOSTI Permit

**THIS IS TO CERTIFY THAT:
MS. LEAH CHERUS BOIT
of MOI UNIVERSITY, 0-30100
ELDORET, has been permitted to conduct
research in Uasin-Gishu County**

**on the topic: AN ASSESSMENT OF
AGRICULTURAL EXTENSION WORKERS'
COMPETENCIES IN ADDRESSING GENDER
ISSUES AFFECTING AGRICULTURAL
PRODUCTIVITY IN UASIN GISHU COUNTY**

**for the period ending:
31st May, 2018**

.....
**Applicant's
Signature**

**Permit No : NACOSTI/P/17/83101/17531
Date Of Issue : 31st May, 2017
Fee Received :Ksh 1000**



.....
**Director General
National Commission for Science,
Technology & Innovation**

Appendix 6: NACOSTI Authority



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

Telephone: +254-20-2213471
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uthuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/17/83101/17531** Date: **31st May, 2017**

Leah Cherus Boit
Moi University
P.O. Box 3900-30100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“An assessment of agricultural extension workers’ competencies in addressing gender issues affecting agricultural productivity in Uasin Gishu County,”* I am pleased to inform you that you have been authorized to undertake research in **Uasin Gishu County** for the period ending **31st May, 2018.**

You are advised to report to the **County Commissioner and the County Director of Education, Uasin Gishu County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Uasin Gishu County.

The County Director of Education
Uasin Gishu County.


**COUNTY COMMISSIONER
UASIN GISHU COUNTY**


**For: THE COUNTY DIRECTOR OF EDUCATION
UASIN-GISHU COUNTY
TEL: 053-2063342 / 0719127212
P. O. Box 9843-30100,
ELDORET.**

Appendix 7: Plagiarism Certificate Awareness



SR878

ISO 9001:2019 Certified Institution

THESIS WRITING COURSE

PLAGIARISM AWARENESS CERTIFICATE

This certificate is awarded to

LEAH CHERUS BOIT

SASS/PGGS/014/09

In recognition for passing the University's plagiarism

Awareness test for Thesis entitled: **ASSESSMENT OF AGRICULTURAL EXTENSION WORKERS' COMPETENCIES IN RESPONDING TO GENDER ISSUES AFFECTING AGRICULTURAL PRODUCTIVITY IN UASIN GISHU COUNTY, KENYA** with similarity index of 7% and striving to maintain academic integrity.

Word count:27363

Awarded by

Prof. Anne Syomwene Kisilu
CERM-ESA Project Leader Date: 17/06/2025