

**GENDER DYNAMICS AND SUSTAINABILITY OF SMALLHOLDER
AGRICULTURAL PROJECTS IN HOMABAY COUNTY**

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DECLARATION

I declare that this research project is my original work and has not been presented for any examination in any other institution.

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Date: 22/11/2023

Supervisors' Approval

This research project has been submitted for Departmental review with my approval as the university supervisor.

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DEDICATION

This work is devoted to my parents, siblings, husband and Son, Joseph and daughter Maya.

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ABSTRACT

Agriculture is a vital force for growth and the eradication of poverty. In spite of this, the industry is underperforming in many countries, in part because of the challenges that women face in order to boosting productivity. The purpose of this study is to examine the gender dynamics and sustainability of smallholder agricultural projects in Homabay County. The objectives of the study are: to determine the influence of gender roles ; to examine the influence of gender relations ;to examine the influence of access to resources and to assess the influence of gender preferences on the sustainability of smallholder agricultural projects in Homabay County. This study was guided by Empowerment Theory. A descriptive research design was employed. The target population was 4,012 farmers in the project areas and 3 project managers. The study's sample size was 351. Stratified random sampling was employed to select sample for farmers. A proportional representation of each population strata was employed. Thereafter, simple random sampling was carried out. The data for this study was gathered through mixed methods. Data was analyzed using descriptively. Multiple and simple linear regression analysis were used to examine the quantitative data that will be gathered and coded. This was used to determine how the variables are related. The association between the variables was determined using regression analysis at 95% confidence level. There was an insignificant positive effect of gender roles on sustainability of smallholder agricultural projects. The results showed a significant and positive association between gender relations on the sustainability of smallholder agricultural projects in Homabay County. The study revealed a significant and positive association between access to resources and sustainability of smallholder agricultural projects in Homabay County. The study revealed an insignificant association between gender preferences on the sustainability of smallholder agricultural projects in Homabay County. It was concluded that women are burdened with most of domestic work while men focus on cash crop cultivation, which generates greater income potential. It was noted that cultural norms continue to perpetuate gender disparities within the farming sector. Men and women are not treated equitably. gender disparities in resource access persist, impeding the realization of agricultural projects' sustainability. Women are predominantly preferred for subsistence farming while men are more commonly preferred for roles associated with cash crop production, agriculture produce marketing, and access to agricultural inputs. The study recommended that the ministry of youth, sports and gender in Homabay county should help foster good working relations amongst genders through public awareness and working with community leaders. The leadership at the sub county level in Homabay county should develop policies that give equal opportunities to both genders to agricultural extension services and market value chains. Non-governmental organisations and related stakeholders should challenge cultural norms and stereotypes that dictate gender-specific roles in agriculture. The non-governmental organisations should advocate for policies and practices that enable women to own land, access credit and receive the same level of technical assistance and training as men.

ABBREVIATIONS AND ACRONYMS

ADP	Agricultural Development Project
CA	Conservation Agriculture
CSA	Climate-Smart Agriculture
FAO	Food and Agriculture Organisation
FSA	Farm Service Agency
ICRW	International Center for Research on Women
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
ILOSTAT	International Labour Organisation Department of Statistics
KIPPRA	Kenya Institute for Public Policy Research and Analysis
NACOSTI	National Council for Science, Technology and Innovation
PSAD	Participatory Sustainable Agricultural Development
SAM	Sustainable Agricultural Mechanization
SDG	Sustainable Development Goals
SFA	Sustainable Food and Agriculture

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Increasing global population and demand has compelled the world to be innovative to supplement its ever-threatened ecosystems. As a result, there is heightened emphasis for sustainability in global projects in the 21st century with governments across the world having intensified global summits on food security, climate change and other issues. Sustainability is a societal goal that aims for people to coexist in the world for a long time without denying the ecosystem the ability to sustain future generations (World Bank, 2013). To deescalate global threat of depleting the ecosystem sustainable agricultural development is a major milestone. However, achievement of this venture is affected by gender dynamics among others.

In sub-Saharan Africa, smallholder farmers, who constitute about 80 percent of all farms, directly employ approximately 175 million people (FAO, 2019). Women contribute more than half of the labor force in these countries (Malapit, 2019). Smallholder farming is characterized by farming on small plots of land, typically less than two hectares, owned by individual farmers (Mosso, Pons & Beza-Beza, 2022). These farmers engage in crop farming for both subsistence and commercial purposes, often meeting the needs of their families. They utilize groundwater and small-scale irrigation methods for irrigation purposes. Smallholders generally operate as individual farmers, although they may also work in groups for farming projects.

Sustainability refers to long-term support or performance, where the benefits continue even after the withdrawal of programs or organizations that initially facilitated those benefits (Wekesah, Mutua & Izugbara, 2019). Achieving sustainability in smallholder agriculture is a complex challenge. Smallholder agricultural projects should be viable, environmentally friendly, and capable of meeting long-term food needs (Badstue, Eerdewijk, Danielsen, Hailemariam & Mukewa, 2020).

The sustainability of smallholder agricultural projects relies on the implementation of effective agricultural practices. These practices encompass a variety of activities that aim to achieve high productivity and minimize negative environmental impacts (Mulema, Cramer & Huyer, 2022). To ensure the sustainability of these projects, it is essential to have clear definitions of

sustainability that consider factors such as profit motives, advancements in science and technology, and appropriate policies that promote social, economic, and environmental well-being (Tavenner, Crane, Bullock & Galiè, 2022). Smallholder agriculture faces challenges posed by evolving technological advancements. Consequently, the significance of ensuring the sustainability of smallholder agricultural projects is increasing (Petesch & Badstue, 2020).

Gender dynamics relates to the many issues relating to male or female. Different cultures hold different views on their roles. The international development community has accepted that agriculture acts as a stimulant for growth and the reduction of poverty. All developing nations' agricultural and rural economies depend heavily on women. The agricultural sector is changing due to economic and sociocultural variables in various parts of the world, and their functions vary greatly between and within regions. Building on the contributions that women make, governments could attain their objectives effectively (World Bank, 2016).

Agriculture underperforms as women have inequitable access to opportunities for more productivity (FAO, 2011). Women constitute 43% of the labour required in agriculture in emerging economies. However, compared to their male counterparts, female farmers often produce less and engage less in commercial farming. The gender dynamics in access to resources, services, gender preferences, and gender roles, among other things, are to blame for these gender inequalities in land production.

Less than 15% of all landowners worldwide are women. Five percent of Middle East women and 18% in North Africa own land. In addition, compared to men, women landowners are less likely to possess documentation that proves their ownership (FAO, 2015). In households without a labor-age man present, these disparities are even more obvious. In addition to having a lower likelihood of owning land, households headed by women also tend to own less land on average than households headed by men. In the Indian state of Karnataka, just 18% of homes with female heads of landholding received an extension visit, compared to twenty nine percent of households headed by males. In the case of livestock extension, 79% of families headed by women had extension agents' contacts, as opposed to 72% of households headed by men (World Bank & IFPRI, 2010). The aforementioned makes note of a preference towards men.

Across all nations, households with a male head of home are more likely to utilize chemical fertilizer. In almost every country, this difference is more pronounced for households led by women. In Malawi, male household heads use much more fertilizer, have larger cash crop areas, and have larger overall fields than female farmers, indicating that male farmers have access to

more land, labor, and money (WBO, 2013). Peterman et al. (2010) analyzed 20 papers from the previous ten years on gender dynamics in the usage of technology inputs for purchased inputs. They discovered that while women used more of these inputs in the remaining four research, men used more of them in 16 out of the 20 experiments. Women are less likely to use fertilizer than men are, which could be explained by a number of factors, such as their inability to raise the money needed to buy fertilizer, the fact that they tend to grow more staple crops than cash crops and a lack of knowledge about the benefits of fertilizer.

Pender and Gebremedhin (2006) demonstrate that in Ethiopia, households led by women employ much less work per hectare than do households headed by men. WBO (2013) demonstrates that one factor contributing to the lower yields of women's fields in Burkina Faso is the decreased usage of labor in these crops. There may be barriers preventing women from accessing certain segments of the labor market. According to Hill and Vigneri (2009), because men and women in Ghana are in different groups, female cocoa farmers are unable to access male labor through exchange labor groups. For occupations that call for strength, like felling trees, women require the assistance of men. As a result, female cocoa producers who have no other way to get men to work for them must rely on wage or seasonal work.

Furthermore, evidence from Kenya demonstrates that households headed by women adopt improved seeds and fertilizers at considerably lower rates than do households headed by men (WBO, 2013). There is conflicting evidence about gender and the adoption of better cultivars. For instance, Doss and Morris (2001) discovered that women in male-headed households in Ghana are not less likely to adopt high-yield maize. A new technique and extension study are documented in Malawi by Gilbert et al. (2002). Although the extension agents predominately selected houses with male heads, they discover that among participating households with female heads, maize plots produce lower yields. The provision of fertilizer and other inputs provide no difference between the sexes. Contrarily, a research (Tiruneh et al., 2001) reveals that families headed by women are less likely to adopt better varieties in Ethiopia (in this case, wheat). Furthermore, numerous studies conducted in Zambia and Kenya show that households headed by women are less likely to adopt enhanced maize (WBO, 2013).

In Kenya, women utilize fewer bundles of physical inputs than men do, particularly inputs purchased from stores. Women in Uganda, Malawi and Tanzania have higher unpaid care and household workloads than men, which limits their ability to devote time to agricultural work. Normally, women work in farms that are owned by their husbands or those which they co-jointly own, before focusing on their own farms. This is particularly common in polygamous

setups. Therefore, the amount of time spent in these farms is more than that which the women spend on their 'own' farms. This causes a disparity and greatly affects productivity in the farms. The effect of this is low incomes from women owned farms and their inability to invest and reinvest in agriculture, hence dependency on their husbands for their needs and wants (UN Women & UNDP-UNEP PEI, 2018).

The Kenyan economy is heavily dependent on agriculture. Approximately 34.2% of the nation's GDP is contributed by this industry, which also employs more than 60% of the workforce, 70% of whom reside in rural areas. Additionally, the sector is a major contributor to the 10% yearly economic growth that Kenya Vision 2030 anticipates (KIPPRA, 2021). A contemporary, commercially driven, and inventive agriculture industry is envisioned in the strategy. Smallholder farming in the country is primarily focused on subsistence, and it encounters numerous challenges that hinder agricultural investments and increase the risk of food insecurity. These challenges include limited or no access to credit, difficulties in obtaining or affording production inputs and irrigation equipment, restricted market access, lack of market information, and limited agricultural extension services. While the adoption of modern farming practices can enhance the production potential of smallholder farmers, financial constraints continue to be a significant barrier (Quisumbing & Doss, 2021). One of the main issues causing the nation's low agricultural production, particularly for women, has been highlighted as a lack of affordable access to agricultural financing. Other restrictions include limited market access, limited quality inputs, inexpensive technologies, climate change, and inadequate infrastructure. Women in Kenya make up around 75% of the agricultural labor force, according to ILOSTAT (2019), compared to only 51% of Kenyan males. In the traditional Kenyan culture, women are majorly housewives. They are, therefore, greatly constrained on land ownership and long-term investments. They face many gender related constraints.

Agriculture in Homabay county is characterized by crop failure due to unreliable rainfall especially in the marginal zones. Also, like many other parts in the world and being a region in Kenya, sustainability of agriculture in the county is influenced by gender dynamics. The gender disparities in the society occasioned by culture where men and women are expected to behave in a particular way or undertake certain tasks and not others are not unique in Homabay (Auma, 2011).

1.2.Statement of the Problem

Agriculture is a vital force for growth and the eradication of poverty. But the industry is underperforming in many countries, in part because of the challenges that women must face in

order to boost productivity. Less than 15% of all landowners worldwide are women. Additionally, women landowners are less likely to have proof of ownership documents as compared to men (FAO, 2015). The segregation is not only in land but in other resources as well. Gender roles, preferences, and relations are also a great threat to sustainable agriculture.

In Kenya, Malawi, Uganda, and Tanzania, women devote their time to agricultural work due to the heavy demands of unpaid care and domestic duties. Additionally, they have limited resources and freedom to venture into lucrative agricultural deals. Kenya is highly patriarchal society. Most parts in Homabay County are rural and greatly influenced by cultural stereotypes that elevate men over women. Homabay county ranked among the counties with the least number of women with land title deeds - only 4 percent of women had the land documents (Kenya Land Alliance, 2018). The above dynamics greatly hamper the strive towards agriculture sustainability. This study examined gender dynamics and sustainability of smallholder agricultural projects in Homabay County.

1.3.Purpose of the Study

The purpose of this study was to examine the gender dynamics and sustainability of smallholder agricultural projects in Homabay County.

1.4.Objectives of the Study

The objectives of the study were;

- i. To determine the influence of gender roles on sustainability of smallholder agricultural projects in Homabay County.
- ii. To examine the influence of gender relations on the sustainability of smallholder agricultural projects in Homabay County.
- iii. To examine how access to resources influence sustainability of smallholder agricultural projects in Homabay County.
- iv. To assess the influence of gender preferences on the sustainability of smallholder agricultural projects in Homabay County.

1.5.Research Questions

The study sought to answer the following questions:

- i. How does gender roles influence the sustainability of smallholder agricultural projects in Homabay County?

- ii. How does gender relations influence the sustainability of smallholder agricultural projects in Homabay County?
- iii. How does access to resources influence the sustainability of smallholder agricultural projects in Homabay County?
- iv. How do gender relations influence the sustainability of smallholder agricultural projects in Homabay County?

1.6. Significance of the Study

One of Kenya's government agenda is to achieve food security in the country. With the devolved function this agenda will be realized faster. The county should intensify its commitment to agriculture so as to join hands with the national government. One such way is through research to identify the existing gaps that might be slowing its achievement. Therefore, the findings of this study may play a critical role in informing Homabay County government the gender dynamics that influence sustainability of smallholder agricultural development projects, thus influencing their agricultural policies. The findings may also be useful in other counties and may contribute to achieving food security.

1.7. Delimitation of the Study

This study was conducted in Homabay County. It involved farmers in small-scale and large-scale farming. The study focused on gender dynamics on sustainability of smallholder agricultural projects.

1.8. Limitations of the Study

It was not easy to locate owners of farms or farmers. However, extension officers were used to identify the owners. Some respondents were also not be open to disclose information. This was mitigated by explaining the purpose of the research to the respondents. Additionally, reassuring them of confidentiality. Some respondents expected payment after participating in the exercise.

1.9. Assumptions of the Study

It was assumed that respondents were familiar with the concepts of sustainability of smallholder agricultural projects and that of gender dynamics. This enhanced the credibility of the study's findings.

1.10. Definition of Significant Terms

Gender characteristics of males and females as socially constructed

Gender dynamics these are gender related issues or concepts

Sustainability of Agricultural

Development Projects this is maintaining agricultural projects for a long time by way of embracing agricultural practices that yield high profits and returns

Gender roles this is the expected way of behavior for men and women as socially constructed

Gender relations how men and women interact

Gender preferences what men and women are fond of

1.11. Organization of the study

The first chapter discusses the study's introduction. Literature review is explained in the second chapter. The third chapter discusses the methodology for the study. The study's results are analysed in the fourth chapter. The last chapter summarizes the study's findings, discussions, recommendation and conclusions.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter focuses on sustainability of smallholder agricultural projects, genders roles, gender relations, access to resources and gender preferences. The chapter also explains the theories that underpin the study. The study's conceptual framework is also proposed.

2.2. Sustainability of smallholder agricultural projects

According to FAO, sustainable agriculture defines agricultural practices that meet the demands of current and future generations, while guaranteeing economic and social equity, environmental well-being, and profitability. Sustainable food and agriculture (SFA) add to the four foundations of food security namely access, availability, utility, stability; and elements of sustainability, such as economic, social, and environmental. FAO supports SFA in assisting countries globally attain Sustainable Development Goals (SDGs) and Zero Hunger. The five primary principles of SFA are increasing employment, productivity, as well as value addition in agricultural and food systems, protecting and enhancing natural resources, and fostering all-encompassing economic growth and improving livelihoods. Furthermore, the SFA also focuses on enhancing individuals, communities and ecosystems resilience and adapting governance processes to new food and agricultural challenges.

Zhou & Tong (2020) also suggested that evolving transportation structures between trading partners is another vital way of ensuring sustainable agriculture. Using China and Belt and Road (B7R) countries as focus of the study, the researchers found that the former's trade with the latter remained highly concentrated in relation to types and regions. The network of trade of the Chinese economy comprises four segments, with external and internal trade of segments becoming increasingly close. Furthermore, trade agreements, geographical location, trade structure, transportation, and water resources are major factors that shape the trading network between the Republic of China and B & R partners.

Lu *et al.* (2022) did a study to determine the significance of incorporating Sustainable Agricultural Mechanization (SAM) particularly in developing nations. The researchers found that economic factors had the greatest influence of SAM, government policy was central in promoting agricultural development, while environmental factors were the most noteworthy factors shaping agricultural machinery sales and production and agricultural production. However, Kusnandar *et al.* (2019) there is need for effective participation to empower changes

for sustainable agricultural practices. Sustainable Agricultural Development (SAD) needs engaging and empowering every actor in the supply and production chain to support change. The researchers used a novel framework that consisted of economic, environmental, social, and governance-oriented factors that shape participatory sustainable agricultural development (PSAD). The findings suggested social factors, such as empowerment and engagement that are less mentioned in SAD programmes had significant influences over time. Besides focusing on skills and knowledge associated with food production, safety, and capacity development, a SAD program needs to consider social issues of empowerment and engagement to allow sustainable transformation over time for sustainable agricultural development through participation.

Newell *et al.* (2019) examined the political-economic and governance issues facing developing nations, especially African states in initiating Climate-Smart Agriculture (CSA) as a sustainable agriculture initiative. Today, there is the need of enriching understanding regarding the diverse circumstances and means in which states navigate and alleviate the inevitable conflicts and choices, as well as trade-offs and synergies that characterize initiatives to operationalize these goals. The researchers argue that a majority of developing countries depend on external funding, which is dependent of terms and conditions by financing partners. As a result, there is a need to embrace local solutions to support Climate-Smart Agriculture in developing countries, such as Kenya, Uganda, Tanzania, and Rwanda among others.

2.3. Gender roles and sustainability of smallholder agricultural projects

Kinkingninhoun *et al.* (2020) did a comparative investigation of women's' role in rice cultivation in Sierra Leone, Madagascar and Ivory Coast by observing the labor time dispersion and resulting salary for women and men. Furthermore, the study also investigated the disadvantages of the participants' labor inputs in various rice cultivation environments. The findings indicated that men and women spent few hours a day in production. However, the findings also showed that apart from rice parboiling that is mainly done by women, men were more involved in rice farming than women after observing the dispersal of labor input in productive activities.

In another study, Wekesah *et al.* (2019) reviewed synthesized knowledge and understanding on the relationship between gender and conservation agriculture (CA) in sub-Saharan countries. The review found the comparative disregard for gender concerns in CA research in sub-Saharan countries, while few studies focused on gender as a social occurrence. Furthermore, the researchers also found that a majority of the reviews also perceived gender in terms of sexual

categories of males and females. As a result, the study concluded that women farmers implemented CA less and those that had implemented it discarded CA more. A study by (World Bank 2012) discovered that poor access to land, inputs. CA boosted food safety, labor involvement, but increased the risk of deprivation of land by men when CA initiatives become profitable.

Therriault *et al.* (2017) carried out a study to increase understanding and acceptance of gender differences in agricultural intensification strategy adoption. The researchers examined gender variations in acceptance rates, possibility and factors that influence adoption strategy sets that boost agricultural yields, protects crops, and restores soils in Burkina Faso. The researchers found that cereal fields' female managers were less likely than cereal male managers to adopt soil-restoring and yield-enhancing strategies, but there was no apparent differential in yield-protecting strategies. Furthermore, the study also found that characteristics of managers influenced the likelihood of implementing agricultural diversification.

2.4. Gender relations and sustainability of smallholder agricultural projects

Ignaciuk and Chit (2019) argue that dealing with gender inequality is the main means of attaining sustainability. High gender inequality levels make it difficult to boost agricultural productivity and decrease hunger and poverty. According to the report, countries with comparatively unequal incomes witness decreased land productivity and are highly disposed to food insecurity, as they continuously slow economic growth and progress towards ending hunger and attaining gender equality. As a result, gender inequality is blamed for the failure to attain sustainable agricultural development in various dimensions. Ownership of property, access to credit and agricultural extension services are seldom offered to women. There is also discrepancy in technology adoption and training on land inputs is seldom issued to the women folk. Whenever there is increased land right to women, there is a decrease in poverty. The rights to land also influence rural to urban migration. A study was conducted on land rights in rural Niger. Women farmers found it more challenging to obtain labor-saving and cutting-edge agricultural inputs due to gender discrimination in the credit markets. Despite some investors facilitating finance availability, this may prevent women from participating in out grower schemes.

Third, social development efforts might lessen the amount of home work that falls on women, but sadly, investors rarely take their requirements into account, which frequently leads to unpaid employment. Contract farming can benefit from investments that provide women access to

labor-saving technologies. Access to financial resources by women would enhance food security. The switch from food crop to cash crop growing could pose new dangers to food security. Investment projects have a history of reproducing gendered labor divisions that force women into short-term, precarious jobs. Contract farming programs have the potential to increase women's earnings, but they have mostly been unavailable to them. Although employment conditions, including compensation, are sometimes poor, plantation-style agro-export businesses might generate new paid employment opportunities.

2.5. Access to resources and sustainability of smallholder agricultural projects

There is strong evidence linking secure land tenure to higher levels of agricultural productivity and investment, and therefore to higher incomes and better economic prosperity. Women are less advantaged than men in this regard. According to Ackoff et al. (2017), farmers' main economic issue is gaining access to land, which is still significantly influenced by unequal gender relations.

In the United States, where many farmers rely on them to manage the financial constraints of farming, women have less likelihood to get agricultural subsidies. In contrast to small farms, organic farming, fruits and vegetables, and enormous farms that practise industrial agriculture, the Farm Bill mainly promotes commodity crops (Ayazi & Elsheikh, 2015; Johnson & Monke, 2016). The likelihood of women working on smaller farms and producing fruits and vegetables, which are less likely to get government subsidies, is higher (Hall & Mogyorody, 2007). This is because cash crops need more area, money, and technology may be the cause of these patterns. The long-held prejudice that tractors and equipment are only the purview of men has been influenced by the exclusion of women by men from locations where farmers learn about mechanics and machine operation. The average size of women's farms is smaller than that of men's farms due to historical discrimination against women over access to land and capital, (Carter, 2017). For black women in particular, the circumstance is worse (Leslie & White, 2018). In general, the subsidies of women at the farms is much lower than those of their male counterparts.

When it comes to access to production elements, which are frequently owned by men because they are typically the head of the household and the only decision-makers, women face more restrictions than men (KMAP, 2016). These restrictions range from access to credit and inadequate financial training. This causes the contribution of women to agriculture to be less than that of their ,male counterparts. The women could be overburdened with labour at the

farms but still earn less than men. This disadvantages them in a major way, thus affecting the family unit (van Eerdewijk et al., 2017). Agricultural productivity thus ceases to benefit the whole community due to the unequal access to inputs of production and unequal distribution of incomes and agricultural resources (Ndanga et al., 2013).

Inequality within the family can harm a woman's status both within and outside the home. Women are more inclined to accept lesser pay when they have less control over household decisions, less access to resources, and lower household income. The argument that women commonly hold positions with lower salary is supported by data. Hertz et al. (2019) explored job distribution by salary in rural locations. Average wage for jobs outside of agriculture were found to be higher. Forty three percent of the labour force in agriculture in emerging economies is made up of women. This has a big impact of the GDP of these nations.

There exist gender imbalances in the access to resources, equipment and credit for agricultural production. Women have little or no access to these critical factors of production. Additionally, the women are disadvantaged as far as land rights, labour, resources and decision making are concerned. They are usually passive in agricultural investments and activities. This greatly affects their activities and incomes. Statutory land rights are less frequently held by women, and when they do, their parcels of land are frequently small. Foreign investors demand dealing with the actual owners of land; this disadvantages women in terms of decision making, land productivity and incomes. Additionally, they frequently prevent women from using common lands for domestic use (Petesch & Badstue, 2020).

2.6. Gender preferences and sustainability of smallholder agricultural projects

Women farmers may make progress as sustainable agriculture gains traction, but gender-based obstacles still exist. Sustainable and organic farm operators are more likely to be women than industrial farm owners (Sachs et al. 2016). This trend may be brought on by the fact that sustainable agriculture frequently requires smaller land sizes, less equipment and consequently lower initial capital investments than large scale agriculture, thus readily available to women who have faced discrimination in gaining access to land, equipment, and capital. Women in sustainable agriculture occasionally hold different values than men, including high-quality family life and spirituality, as well as perceptions of quality life (Pilgeram & Amos, 2015).

Women household chores makes it harder for women to engage in activities that generate cash. Additionally, the nature of the task compels women to stay near to the house, which limits their

options for employment. Examples of this type of work include caring for the young and the old. Due to a lack of time, many women create small cottage companies like handicrafts, which are frequently characterized by poor profits and little room for growth (Lanjouw, 2014).

When examining women's workloads, gender discrepancies become more evident. In many different nations, it is believed that women spend between 85 and 90 percent of the time processing and preparing food for the household (Wrangham, 2009). In most cases, women are also in charge of childcare and housework. These tasks may take a long time, depending on the size and structure of the family. Studies on time allocation have revealed that, when caregiving is included in, women work much more than men (Budlender, 2008). According to Sharma et al. (2007), girls labor substantially harder than boys at home and at the farm.

Even though Ghanaian women work outside the home almost as frequently as men do, they nonetheless bear a significantly higher responsibility for household duties (Brown, 2009). Women in Uganda were unable to increase their production in the market as they spend time taking care of the children and tending to household chores (Ellis et al., 2020). Men, however, merely stated that they lacked the funds to hire labor. Most unpaid employment in Tanzania exhibits a clear gender bias (Fontana & Natali, 2008).

2.7. Theoretical framework

This study will be guided by Empowerment Theory by Friedmann (1980).

2.7.1. Theory of empowerment

According to empowerment theory, a repressive and stratified social, political, and economic environment is the best context for comprehending societal issues. The empowerment theory acknowledges the relationship and reciprocal influence of individuals and groups to the environment and society. It also implies that human problems can be effectively treated simultaneously. When used directly on people, empowerment interventions may help people develop their psychological self-efficacy or coping mechanisms for navigating the current social situation.

Social empowerment is the process of acquiring the autonomy, power, self-belief, and other assets necessary to bring about change and clear the way for a better future. Individuals and groups can both be empowered socially. Social empowerment includes acquiring the inner and external resources that allow us to control our surroundings. Social empowerment organisations support marginalized groups of people in obtaining the tools necessary to become

empowered. Giving those without access to these resources a feeling of identity, community, and wellbeing will enable them to thrive, and systems that keep them without the resources they need and sustain marginalization will be dismantled (Friedmann, 1980).

The concept of gender dynamics and sustainable agriculture is anchored greatly on the above theory. The inadequacies and shortfalls that emanate from gender dynamics, thus threatening sustainable agriculture are better interrogated and can be addressed from the inspiration of empowerment theory. As shown above, the theory greatly leverages on marginalized groups and how such can be given an identity to thrive, hence the anchoring of the study on the theory.

2.8. Conceptual framework

Independent Variables

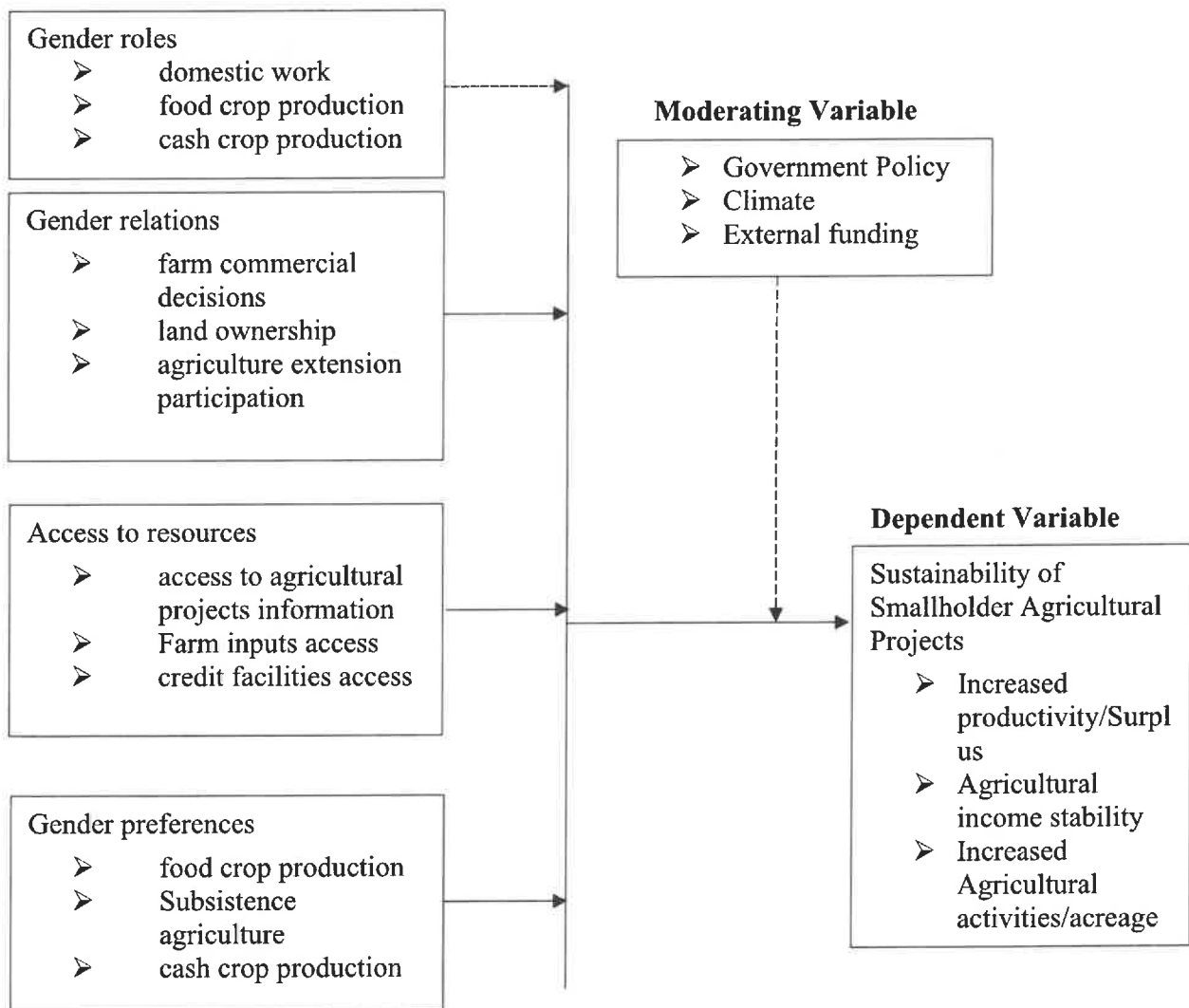


Figure 2. 1: Conceptual framework 1

sustainability of smallholder agricultural projects. Development processes, economic growth and the modernization of agriculture have unequal effects on women and men, lacking gender neutrality (Annes, Wright & Larkins, 2021). Although women play a significant role in agriculture, their contributions are often undervalued and overlooked. The implementation of sustainable agricultural innovations may result in trade-offs and adverse effects on various social groups or genders, depending on the specific intervention and local circumstances (Haque, Choudhury, Adam & McDougall, 2020). While promising solutions often prioritize technology, they may not adequately address gender and social disparities.

Gender inequalities encompass various aspects such as technology, agricultural inputs, labor, financing, extension services, and land. As a result, the agricultural sector faces real costs, leading to limited efficiency and negative consequences for the broader economy and society (Doss, Meinzen, Quisumbing & Theis, 2018). Redistributing inputs and resource control between female and male farmers holds the potential to greatly improve productivity, food security, and nutrition outcomes, while also positively influencing education (Leslie, Wypler & Bell, 2019).

Attempts to improve low agricultural productivity often prioritize technological advancements, often overlooking the social and gender disparities that exist (Acharya, Subedi & Upreti, 2020). In Homabay County, which is predominantly rural, cultural stereotypes that favor men over women significantly influence the region. Homabay County has one of the lowest percentages of women with land title deeds, with only 4 percent of women possessing the necessary documents (Kenya Land Alliance, 2018). These dynamics present significant obstacles to achieving agricultural sustainability. Figure 1 illustrates how independent variables, that is, gender roles, gender relations, access to resources and gender preferences influence the dependent variable, sustainability of smallholder agricultural projects, moderated by government policy, climate and external funding.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The research design used is explained. Details on how a sample will be chosen from the target population to participate in the study are also highlighted, along with information about the target population. Along with the methods utilized to conduct this study, the tools that were used for data collecting are also outlined. The methods used to examine the data are covered in the chapter's later sections. The chapter concludes with ethical concerns that were present in the process.

3.2 Research Design

The study used a descriptive design. The objective of a descriptive research design is to observe and describe a subject's behaviour without changing it (Abutabenjeh & Jaradat, 2018). Many scientific fields, especially social sciences, use this method to obtain a broad understanding of problems. A descriptive research design was especially beneficial when it is impossible to test and measure the huge samples needed for quantitative research. Through a descriptive design, the selected respondents provided information on their experiences on the study topic. The design helped examine gender roles, gender relations, access to resources and gender preferences on the sustainability of smallholder agricultural projects in Homabay County. Thus, it was the most appropriate to this study.

3.3 Target Population

This study focused on smallholder agricultural projects in three sub counties in Homabay county. Irrigation supports smallholder farmers in Suba North, Ndhiwa and Rangwe sub counties. The target population for this study were 4,012 farmers in the project areas. Additionally, there were 3 project managers, each responsible for a project area. Hence, the study's population was 4,015. The target population is shown in Table 3.1

Table 3.1: Target Population

Project Area	Farmers	Project Managers	Population
Suba North	1119	1	1,120
Ndhiwa	1851	1	1,852
Rangwe	1042	1	1,043
Total	4012	3	4015

Source: Ministry of Agriculture, Livestock, Fisheries and Food Security, Homabay County (2023)

3.4 Sample Size

The Krejcie and Morgan (1970) table (Appendix VI) for sample size is used to arrive at the sample size. From the tables, the study's sample size is 351.

3.5 Sampling Procedure

The study will include the 3 project managers in the study. Stratified random sampling was used to select the sample for farmers. The strata are the 3-project areas/sub counties. This ensures that all study categories are represented in the population proportionately. After that, a proportional representation of each population strata was employed. The respondents were selected so that the sample will reflect the population's existing categories. The population was divided into three strata that is Suba North, Ndhiwa and Rangwe. Thereafter, simple random sampling was carried out. From the list of farmers provided, a random number assigned to a farmer was selected by the researcher. Table 3.2 illustrates sample size:

Table 3.2: Sample Size 1 1

Project Area	Population	Farmers Sample
Suba North	1,120	98
Ndhiwa	1,852	162
Rangwe	1,043	91
Total	4,015	351

Source: Researcher (2023)

3.6 Research Instruments

The farmers sampled for the study were given questionnaires, which collected quantitative information on gender roles, gender relations, access to resources and gender preferences on the sustainability of smallholder agricultural projects in Homabay County. The study conducted face to face interviews the project managers. Respondents provide extra details about a subject through interviews (Jain,2021). The interviews collected qualitative information on variables of the study.

3.7 Pilot Study

The pilot study was conducted in Rachuonyo North sub-county as the designated location. A sample size of 35 participants was used, which corresponds to 10% of the expected sample size for the main study, as recommended by Connelly (2008). The study began by clearly communicating the purpose and objectives to the participants involved in the pilot study. The participants received questionnaires to complete independently, without any intervention or disruption from the researcher or research assistants. Throughout the pilot test, the researcher carefully assessed the implemented procedure and activities. The time taken by participants to complete the questionnaires was measured to gain valuable insights into the feasibility of the questionnaire. Additionally, the researcher made note of any concerns raised by the participants regarding the wording of statements and the legibility of the questions. The researcher modified the questions to make the questionnaire's questions and/or statements easier to understand.

3.7.1 Instrument Reliability

Instrument reliability measures the ability of the instrument to produce similar or nearly identical results each time the same test is conducted (Mohajan ,2017). During the pilot testing phase, two measures, namely test-retest and internal consistency, were employed to assess the reliability of the instruments. Internal consistency was utilized to evaluate the consistency of the questions within the instrument, while test-retest was used to examine the consistency between different administrations of the instrument. A Cronbach's Alpha coefficient of 0.7 or higher was considered indicative of good reliability (Segal and Coolidge, 2018).

3.7.2 Instrument Validity

Construct, content and criterion validity were assessed. Construct validity was utilized to determine whether the instruments effectively capture the targeted concepts. The constructs of gender roles, gender relations, access to resources, and gender preferences regarding the

sustainability of smallholder agricultural projects in Homabay County were carefully developed, and the indicators and measurements of these variables were tested throughout the pilot study to ensure construct validity. Only relevant questions that examined the indicators of gender roles, gender relations, access to resources, and gender preferences regarding the sustainability of smallholder agricultural projects were included in the questionnaire. Content validity assessed how representative the measures of variables will be. The instruments were reviewed by the supervisor to identify any potential gaps, which were then addressed by the researcher.

3.8 Data Collection Procedure

Once the instruments had been successfully validated, the researcher started collecting data. The researcher recruited and trained two research assistants. Questionnaires were distributed in person, and the research assistants assisted in handing out the questionnaires to the participants. To ensure proper representation, the three project areas were visited, and respondents were selected randomly from each area. Those who agree to participate were provided with questionnaires and given sufficient time to complete them. Filled questionnaires were then be collected and reviewed to ensure accuracy. The researcher then booked interviews with the project managers. The study's objectives were explained to these respondents. The interviews took place in quiet settings, free from distractions and noise. Each interview session will be timed 40 minutes. The interviewees were made aware of data recording, through a data recording device. Data recording enables re-examination of the interview (Al-Yateem ,2012).

3.9 Data Analysis and Presentation

Data cleaning and analysis was conducted. Editing, coding and tabulating the data was necessary in data cleaning. This was in order to identify any irregularities in the responses and to give each one a specific numerical value for subsequent analysis. The analyses made use of SPSS. Descriptive statistics was used to analyse the data. Regression analysis was used to examine the quantitative data that was gathered and coded. This was used to determine how the variables are related. The association between the variables was determined using regression analysis. The study hypothesis was tested to evaluate the influence of gender roles, gender relations, access to resources and gender preferences on the sustainability of smallholder agricultural projects in Homabay County. Thematic analysis was used for qualitative data analysis. Results were displayed using tables and narratives.

3.10 Ethical Considerations

The researcher sought approval from the University and NACOSTI. The Department of Agriculture and Food Security of Homabay County was contacted for permission to gather data from respondents. No respondent was exposed to harm, allowed to disclose their personal information or coerced to participate in the study. The participants were assured of no risk of participation.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter outlines descriptive statistics and inferential statistics presentation, interpretations and discussions. It analyses the data as per the objectives; that is, to examine gender roles, gender relations, access to resources and gender preferences on the sustainability of agricultural development projects in Homabay County.

4.2 Response rate

Three hundred and fifty-one questionnaires, out of which 334 were successfully filled and returned, were analysed. Therefore, the response rate of 95% was realized, as summarized in Table 4.1

Table 4.1: Response rate

Project Area	Sample	Responses	Response rate
Suba North	98	93	95%
Ndhiwa	162	154	95%
Rangwe	91	87	96%
Total	351	334	95%

Source: Research Data

The study witnessed a high questionnaire return rate of 95%. A response rate of 70% or more is sufficient (Mugenda & Mugenda, 2002). Consequently, the overall response rate of 95% enhanced the credibility of the study's findings. The three project managers indicated that they had been manager of agricultural development projects for more than 10 years. Their responses were hence reliable for credible findings interpretation.

4.3 Reliability results

The pilot study was conducted in Rachuonyo North sub-county. Thirty five participants was used. The pilot respondents were given questionnaires to complete, and the researcher explained

the study's objectives to them. The reliability results from the pilot research are indicated in Table 4.2.

Table 4.2: Reliability results

Variable	Item	Alpha Value	Recommendations
Gender roles	5	0.918	Reliable
Gender relations	5	0.892	Reliable
Access to resources	5	0.907	Reliable
Gender preferences	4	0.884	Reliable
Sustainability	5	0.871	Reliable

Source: Research Data

The Cronbach Alpha Coefficient was calculated for each variable. Coefficient for sustainability was 0.871, gender roles was 0.918, gender relations was 0.892, access to resources was 0.907 and gender preferences was 0.884. All the variables had reliability values higher than 0.7, which was considered adequate in the study.

4.4 Validity tests

The study conducted validity tests for the questionnaire. The research's instrument validity was achieved by seeking the university supervisor's professional advice. Upon adequate advice from the supervisors, the questionnaire was examined, revised and accepted. The questionnaire provided data that accurately answered the study's research questions.

4.5 Demographic information

The research aimed at determining the participants' demographic information.

4.5.1 Respondents' gender

Findings are indicated in Table 4.3:-

Table 4.3 Respondents gender

Gender	Frequency	Percent
Male	188	56
Female	146	44
Total	334	100

Source: Research Data

Table 4.3 reveals that 188 (56%) of the respondents were male and 146 (44%) were female. Hence, majority of the respondents were male. There was fair distribution of gender, hence no bias.

4.5.2 Respondents' age

Findings are presented in Table 4.4

Table 4.4: Respondents' age

Age	Frequency	Percent
18-25 years	18	5
26-35 years	129	39
36-45 years	133	40
46-55 years	54	16
Total	334	100

Source: Research Data

Table 4.4 reveals that 18 (5%) respondents were aged 18-25 years, 129 (39%) were aged 26-35 years, 133 (40%) 36-45 years and 54 (16%) were 46-55 years. Hence, most of the respondents were aged 36-45 years.

4.5.3 Respondents' education level

Findings are presented in Table 4.5

Table 4.5: Respondents' education level

Education level	Frequency	Percent
Diploma	12	4
Undergraduate	117	35
Masters	205	61
Total	334	100

Source: Research Data

Results indicate that 6 (4%) of the respondents had certificate education, 12 (35%) had diplomas and 117 (61%) had undergraduate degrees. Hence, most of the participants had higher level education, and their responses were reliable for the study findings, analyses, conclusions and recommendations.

4.6 Descriptive analysis

The analysis is presented as per the study objectives that is: to examine gender roles, gender relations, access to resources and gender preferences on the sustainability of agricultural development projects in Homabay County.

4.6.1 Gender roles on sustainability of smallholder agricultural projects

The first objective determined the influence of gender roles on sustainability of smallholder agricultural projects in Homabay County.

Table 4.6 : Descriptives on gender roles

Statement	Male	Female
Gender that does domestic work at the farm houses	0	334 (100%)
Gender that is mostly involved in food crop production process	8 (2%)	326 (98%)
Gender is mostly involved in cash crop production at the farms	330 (99%)	4 (1%)
Gender that makes decisions on production processes in the farms	327 (98%)	7 (2%)
Gender that makes decisions on disposal of produce at the farms	329 (99%)	5 (1%)

Source: Research Data

Results indicate that women did most domestic work at the farm houses. Most of the respondents (98%) indicated that women were the mostly involved in food crop production process, while men were mostly involved in cash crop production at the farms (99%). It was observed that men mostly made decisions on production processes in the farms. Majority (99%) of the respondents indicated that men made decisions on disposal of produce at the farms. Interviewees indicated that women contribute much to agriculture but their efforts are frequently disregarded. They actively participate in a variety of agricultural production activities, such as growing and harvesting crops, caring for livestock, and tending to backyard gardens. Many of the tasks performed by women in agriculture, such as maintaining home gardens or caring for livestock, are classified as domestic or reproductive labour and are sometimes not included in official statistics. Due to their marginalization, women's contributions to food production and agricultural sustainability initiatives may go unnoticed. It was noted that there was a gender-based division of labor, with men and women performing different tasks. It was evident that cultural norms, land tenure structures, market accessibility, and the availability of support services were responsible for gender roles in small scale agricultural projects in the county. There were thus inequalities in gender roles in these projects. These findings align with findings of Kinkinginhoun et al. (2020), who did a comparative

investigation of women's' role in rice cultivation in Sierra Leone, Madagascar and Ivory Coast and observed that rice parboiling was mainly done by women, while men were more involved in rice production. Likewise, Theriault et al. (2017) examined gender variations in acceptance rates, possibility and factors that influence adoption strategy sets that boost agricultural yields, protects crops, and restores soils in Burkina Faso and found that cereal fields' female managers were less likely than cereal male managers to adopt soil-restoring and yield-enhancing strategies, but there was no apparent differential in yield-protecting strategies.

4.6.2 Gender relations on sustainability of smallholder agricultural projects

The second objective examined the influence of gender relations on sustainability of smallholder agricultural projects in Homabay County.

Table 4.7 : Descriptives on gender relations and sustainability

Statement	N	Mean	SD
Cultural norms treat men and women equally in farming	334	1.76	0.604
Men and women make commercial decisions on use of land	334	1.73	0.583
The society encourages women to own land	334	1.57	0.553
Men and women equally participate in agriculture value chains.	334	1.56	0.557
Men and women have equal opportunities in extension services	334	1.62	0.571
Mean		1.65	

Source: Research Data

Most of the respondents disagreed that cultural norms treated men and women equally in farming (Mean=1.76 ,SD=0.604). Respondents disagreed that men and women made commercial decisions on use of land (Mean=1.73, SD=0.583). It was disagreed that society encouraged women to own land (Mean=1.57, SD=0.553). Most of the respondents disagreed that men and women equally participated in agriculture value chains (Mean=1.56, SD=0.557). It was disagreed that men and women had equal opportunities in extension services (Mean=1.62, SD=0.571). The project managers indicated that due to culture, the role of men and women at the farms was clear. Men and women in agriculture were frequently given particular duties and decision-making authority through these roles. In the past, men were thought to be the main landowners and, as a result, the ones who made decisions about farming, including business issues. It was clear that men frequently controlled the distribution of resources, the choosing of crops, and the selling of agricultural products since they owned the land. Because of their lack of power over the land, women have little influence over important

facets of agricultural production. This reinforces conventional gender hierarchies. Women's access to resources was constrained. This limited their capacity for independent decision-making and household negotiation. It was indicated that men made most of the commercial decisions as they were the land owners.

4.6.3 Access to resources on sustainability of smallholder agricultural projects

The third objective examined the influence of access to resources on sustainability of smallholder agricultural projects in Homabay County.

Table 4.8 : Descriptives on access to resources and sustainability

Statement	N	Mean	SD
There is free access to projects information to both men and women.	334	1.72	0.547
Men and women have equal opportunities to join investment groups.	334	1.67	0.569
Men and women are given equal opportunities to access credit.	334	1.70	0.538
Men and women receive equal share of agriculture proceeds.	334	1.69	0.553
Men and women are given equal opportunities in training.	334	1.66	0.596
Mean		1.69	

Source: Research Data

Most of the respondents disagreed that was free access to projects information to both men and women (Mean=1.72 ,SD=0.547). Respondents disagreed that men and women had equal opportunities to join investment groups (Mean=1.67, SD=0.569). It was disagreed that men and women were given equal opportunities to access credit (Mean=1.70, SD=0.538). Most of the respondents disagreed that men and women received equal share of agriculture proceeds (Mean=1.69, SD=0.553). It was disagreed that men and women were given equal opportunities in agriculture training (Mean=1.66, SD=0.596). Interviewees indicated that access to resources for agricultural production was not equal among the genders. Cultural norms and practices that establish gender roles in agriculture and land ownership were linked to gender-based discrepancies in resource access. Men were traditionally considered to be the principal landowners in many countries, giving them authority over agricultural resources and decision-making.

4.6.4 Gender preferences on sustainability of smallholder agricultural projects

The fourth objective examined the influence of gender preferences on sustainability of smallholder agricultural projects in Homabay County.

Table 4.9 : Descriptives on gender preferences and sustainability

Statement	Male	Female
Gender mostly preferred in subsistence farming	3 (1%)	331 (99%)
Gender most preferred in cash crop production	332(99%)	2(1%)
Gender most preferred in agricultural produce marketing	331 (99%)	3 (1%)
Gender with more access to agricultural inputs	331 (99%)	3 (1%)

Source: Research Data

Results indicate that women were mostly preferred in subsistence farming. Most of the respondents (99%) indicated that men were most preferred in cash crop production, agriculture produce marketing and had more access to agricultural inputs. The observations made by the project managers highlighted gender-based distinctions in farming roles and resource allocation. Specifically, the project managers pointed out that women were often relegated to subsistence farming, while men primarily focused on the cultivation of cash crops. Furthermore, when it came to agriculture produce marketing and access to essential farm inputs, it appeared that males had a distinct advantage. This division of labor based on gender was rooted in cultural norms. Subsistence farming involved the cultivation of crops and the raising of livestock primarily for the purpose of meeting the immediate dietary needs of the household. Women were responsible for these subsistence-oriented activities, often tending to household gardens and small-scale farms. These align with findings of Taofeeq, Chukwudi, and Ogechi (2022), who evaluated the dynamics of decision-making within rice-producing households in Nigeria, specifically focusing on the roles played by men and women. Men were found to have a significantly higher level of engagement in pre-harvest decision-making compared to women. This discrepancy in contributions extended beyond the pre-harvest phase, encompassing post-harvest activities as well. This could potentially lead to suboptimal farming practices and hinder overall agricultural productivity. The study underscored the importance of enhancing farmers' access to important farm-related information. This would empower both men and women in rice-producing households to make well-informed decisions about their agricultural practices.

4.6.5 Sustainability of smallholder agricultural projects

The study's dependent variable was sustainability of smallholder agricultural projects in Homabay County.

Table 4.10 : Descriptives on sustainability

Statement	N	Mean	SD
There're increased incomes from agricultural projects.	334	1.75	0.528
There is stability in incomes from agricultural projects.	334	1.68	0.570
The quality of farm produce is better.	334	1.68	0.528
There is increased acreage under agricultural development.	334	1.69	0.550
Farm size per household has increased.	334	1.62	0.571
Mean		1.69	

Source: Research Data

Most of the respondents disagreed that there was increased incomes from agricultural projects (Mean=1.75 , SD=0.528). Respondents disagreed that there was stability in incomes from agricultural projects (Mean=1.68, SD=0.570). It was disagreed that the quality of farm produce was better (Mean=1.68, SD=0.528). Most of the respondents disagreed that there was increased acreage under agricultural development (Mean=1.69, SD=0.550). It was disagreed that farm size per household had increased (Mean=1.62, SD=0.571). The project managers indicated that smallholder farmers face numerous challenges in their efforts to ensure the sustainability of agricultural projects. Farmers often found it difficult to commit long-term funds to sustainable agricultural methods without clear and enforceable ownership or access rights to their land. Farmers who had insecure land tenure were reluctant to use conservation practices, make investments to maintain soil health, or grow long-term crops because they worried about losing their land. Many smallholder farmers relied on middlemen or traders to help them access markets and sell their products. However, the absence of accountability and transparency in these transactions often led to exploitative tactics, unjust pricing, and late payments. This made it more difficult for smallholder farmers to maintain their economic viability and deterred them from implementing more environmentally friendly farming methods. Access to contemporary farming technologies was essential for raising output and sustainability. Smallholder farmers frequently encountered obstacles to using these technologies, such as cost, infrastructure limitations, and a lack of understanding of their advantages. Farmers found it difficult to implement more sustainable and effective farming practices without access to these technologies.

4.7 Inferential analysis

The study conducted correlation analysis. This showed the association between gender relations on the sustainability of smallholder agricultural projects in Homabay County. Additionally, the association between access to resources influence sustainability of smallholder agricultural

projects in Homabay County was correlated. The study conducted a regression analysis to establish examine the influence of gender relations on the sustainability of smallholder agricultural projects in Homabay County and to examine how access to resources influence sustainability of smallholder agricultural projects in Homabay County. The study conducted chi square tests to establish the association between gender roles on sustainability of smallholder agricultural projects in Homabay County and gender preferences on the sustainability of smallholder agricultural projects in Homabay County.

4.7.1 Correlation analysis

Pearson correlation analysis was carried out and results illustrated in Table 4.11

Table 4.11 : Correlation Analysis

		Sustainability	Gender relations	Access resources
Sustainability	r	1	.813**	.697**
	p		0.000	0.000
	N	334	334	334
Gender relations	r	.813**	1	.756**
	p	0.000		0.000
	N	334	334	334
Access resources	r	.697**	.756**	1
	p	0.000	0.000	
	N	334	334	334

****.** Correlation is significant at the 0.01 level (2-tailed).

Source: Research Data

The research findings highlight significant correlations between variables. The significance of correlations is determined by the p-values. In this context, ($p < 0.05$) is regarded significant, while values above 0.05 are regarded as insignificant. There existed a strong correlation ($r=0.813$, $p=0.000$), between gender relations and the sustainability of smallholder agricultural projects in Homabay County. Similarly, the study revealed a significant and positive link between access to resources and sustainability of smallholder agricultural projects in Homabay County ($r=0.697$ $p=0.000$).

4.7.2 Linear regression

A regression analysis was done to examine the influence of gender relations on the sustainability of smallholder agricultural projects in Homabay County. Results are presented in subsequent tables.

Table 4.12 : Linear regression model on gender relations and sustainability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.813 ^a	0.661	0.660	0.15256	1.821

a. Predictors: (Constant), gender relations

b. Dependent Variable: sustainability

Source: Research Data

The findings indicate that the coefficient of determination, represented by R square, is 0.661, equivalent to 66.1%. This implies that 66.1% of the variability in the sustainability of agricultural development projects in Homabay County can be attributed to changes in gender relations, with a confidence level of 95%. The correlation coefficient, denoted as R, serves as a metric to quantify the relationship between these variables. The outcomes showed a significant and positive correlation between the variables, evident by a correlation coefficient of 0.813. With a Durbin Watson statistic of 1.8, no autocorrelation exists among the variables. This allowed for reliable deduction of inferential statistics and interpretation.

Table 4.13 : ANOVA on gender relations and sustainability

ANOVA ^a	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.063	1	15.063	647.173	.000 ^b
Residual	7.728	332	0.023		
Total	22.791	333			

a. Dependent Variable: sustainability

b. Predictors: (Constant), gender relations

Source: Research Data

ANOVA results exhibited a level of significance at 0.000, underscoring the significance of the association between gender relations on the sustainability of smallholder agricultural projects in Homabay County. Moreover, the calculated F-value was observed to be greater than the critical F-value ($647.173 > 3.841$). The model employed in the study was thus reliable. Consequently, the results were considered adequate to formulate credible findings and recommendations.

Table 4.14 : Coefficients on gender relations and sustainability

Coefficients ^a	Standardized Coefficients ,beta	t	Sig.	VIF
gender relations	0.813	25.440	0.000	1.000

a. Dependent Variable: sustainability
b. Predictors: (Constant), gender relations

Source: Research Data

Table 4.14 reveals a significant and positive association between gender relations on the sustainability of smallholder agricultural projects in Homabay County ($\beta = 0.813$, $p < 0.05$). The variance inflation factor (VIF) of 1 indicates that the weights have limited correlation with the predictors in the model, signifying that multicollinearity was not present in the data set. These findings align with those of Ignaciuk and Chit (2019), who emphasised the pivotal role of addressing gender inequality in achieving sustainability. There is thus a relationship between gender equality and sustainable agriculture. Gender inequality significantly hampers efforts to enhance agricultural productivity and reduce hunger and poverty. This assertion reflects the reality that, in many societies, women bear the disproportionate burden of domestic and caregiving responsibilities, leaving them with limited time and access to resources for participating in agricultural activities. This situation not only curtails women's economic empowerment but also impedes overall agricultural productivity (Mulema et al., 2022). Countries characterized by high levels of income inequality are more likely to experience reduced land productivity and heightened food insecurity. The link between income inequality and these adverse outcomes underscores the broader societal implications of gender inequality. Unequal income distribution often reflects and perpetuates gender disparities, as women tend to have fewer economic opportunities and less control over resources. Furthermore, countries with persistent gender inequality issues face challenges in achieving economic growth and making progress toward ending hunger and achieving gender equality (Quisumbing & Doss, 2021). Gender inequality is not just a consequence of underdevelopment; it also acts as a significant barrier to development itself.

Table 4.15 : Linear regression model on access to resources and sustainability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	.697 ^a	0.485	0.484	0.18793	2.505

a. Predictors: (Constant), access resources
b. Dependent Variable: sustainability

Source: Research Data

The coefficient of determination, represented by R square, is 0.661, equivalent to 48.5%. This implies that 48.5% of the variability in the sustainability of agricultural development projects in Homabay County can be attributed to changes in access to resources, with a confidence level of 95%. The correlation coefficient, denoted as R, serves as a metric to quantify the relationship between these variables. The outcomes showed a significant and positive correlation between the variables, evident by a correlation coefficient of 0.697. With a Durbin Watson statistic of 2.5, no autocorrelation exists among the variables.

Table 4.16 : ANOVA on access to resource and sustainability

ANOVA ^a	Sum of Squares	df	Mean Square	F	Sig.
Regression	11.065	1	11.065	313.285	.000 ^b
Residual	11.726	332	0.035		
Total	22.791	333			

a. Dependent Variable: sustainability
b. Predictors: (Constant), access resources

Source: Research Data

ANOVA results exhibited a level of significance at 0.000, hence a significant association between access to resources and sustainability of smallholder agricultural projects in Homabay County. Moreover, the calculated F-value was observed to be greater than the critical F-value (313.285 > 3.841). The model employed in the study was thus reliable.

Table 4.17 : Coefficients on access to resources and sustainability

Coefficients ^a		Unstandardized Coefficients, B	t	Sig.	VIF
1	(Constant)	0.606	9.805	0.000	
	access resources	0.640	17.700	0.000	1.000

a. Dependent Variable: sustainability

Source: Research Data

Table 17 reveals a significant and positive association between access to resources and sustainability of smallholder agricultural projects in Homabay County ($\beta = 0.640$, $p < 0.05$). VIF of 1 indicates that the weights have limited correlation with the predictors in the model, signifying that multicollinearity was not present. These findings support a study by FAO (2018) that pointed out the challenging women face in getting access to finance, extension services

and property ownership. According to the study, agricultural lending is essential for farmers to invest in technologies and long-term farm upgrades as well as to manage the seasonality of agricultural revenue and expenses and an increase in women's land rights are associated with a decrease in poverty. It was noted that women farmers find it more challenging to obtain labor-saving and cutting-edge agricultural inputs due to gender discrimination in the credit markets. According to Ackoff et al. (2017), farmers' main economic issue is gaining access to land, which is still significantly influenced by unequal gender relations.

There exist gender imbalances in the access to resources, equipment and credit for agricultural production (Mosso et al., 2022). Women have little or no access to these critical factors of production. Additionally, the women are disadvantaged as far as land rights, labour, resources and decision making are concerned. They are usually passive in agricultural investments and activities. This greatly affects their activities and incomes. Statutory land rights are less frequently held by women, and when they do, their parcels of land are frequently small. Foreign investors demand dealing with the actual owners of land; this disadvantages women in terms of decision making, land productivity and incomes. Additionally, they frequently prevent women from using common lands for domestic use (Petesch & Badstue, 2020).

Tavener et al. (2022) noted that access to financial resources by women would enhance food security. The switch from food crop to cash crop growing could pose new dangers to food security. Investment projects have a history of reproducing gendered labor divisions that force women into short-term, precarious jobs. Contract farming programs have the potential to increase women's earnings, but they have mostly been unavailable to them. Although employment conditions, including compensation, are sometimes poor, plantation-style agro-export businesses might generate new paid employment opportunities.

4.7.2 Chi square Test

A chi square test was done to determine the influence of gender roles on sustainability of smallholder agricultural projects in Homabay County and to assess the influence of gender preferences on the sustainability of smallholder agricultural projects in Homabay County. Results are presented in subsequent tables.

Table 4.18 Chi square for gender roles and sustainability

Statement	Asymptotic significance (Pearson's chi square)
Gender that does domestic work at the farm houses	
Gender that is mostly involved in food crop production process	0.618
Gender is mostly involved in cash crop production at the farms	0.406
Gender that makes decisions on production processes	0.495
Gender that makes decisions on disposal of produce at the farms	0.003

Source: Research Data

Table 18 revealed an insignificant association between gender mostly involved in food crop production process, gender mostly involved in cash crop production at the farms, gender that makes decisions on production processes in the farms and sustainability of smallholder agricultural projects in Homabay County (p values > 0.05). All the respondents indicated that women did domestic work at the farm houses, hence no statistic. The relationship between Gender that makes decisions on disposal of produce at the farms and sustainability of smallholder agricultural projects in Homabay County was significant (p values < 0.05). These findings agree with those of Lanjouw (2014), who noted that women household chores makes it harder for women to engage in activities that generate cash. Additionally, the nature of the task compels women to stay near to the house, which limits their options for employment. Examples of this type of work include caring for the young and the old. Due to a lack of time, many women create small cottage companies like handicrafts, which are frequently characterized by poor profits and little room for growth (Lanjouw, 2014). Additionally, Brown (2009) noted that even though Ghanaian women work outside the home almost as frequently as men do, they nonetheless bear a significantly higher responsibility for household duties. Women in Uganda were unable to increase their production in the market as they spend time taking care of the children and tending to household chores (Ellis et al., 2020). Men, however, merely stated that they lacked the funds to hire labor. Most unpaid employment in Tanzania exhibits a clear gender bias (Fontana & Natali, 2008).

Table 4.19 Chi square for gender preferences and sustainability

Statement	Asymptotic significance(Pearson's chi square)
gender is mostly preferred in subsistence farming	0.887
gender is most preferred in cash crop production	0.639
gender is most preferred in agricultural produce marketing	0.253
gender more access to agricultural inputs	0.299

Source: Research Data

Table 19 revealed an insignificant association between gender preferences on the sustainability of smallholder agricultural projects in Homabay County (p values > 0.05). According to Doss et al.(2018), women are expected to dedicate a substantial portion of their time to processing and preparing food for their households. This can be a time-consuming activity, and it is a responsibility that predominantly falls on women in various nations. In addition to food preparation, women are often the primary caregivers for children and responsible for housework. These duties can be demanding and time-intensive, especially in larger or more complex family structures. It is implied that these responsibilities are typically not equally shared between men and women. Studies on time allocation have consistently found that when caregiving tasks are considered, women tend to work significantly more than men (Annes et al.,2021). This indicates that the burden on women extends beyond traditional work hours and encompasses unpaid caregiving labor. Girls, particularly, are found to work harder than boys at home and on farms. This suggests that gender roles and expectations are established from a young age, with girls taking on more household and agricultural responsibilities compared to boys. There is a disproportionate burden placed on women and girls, which can have implications for their overall well-being, economic opportunities, and the pursuit of other interests and aspirations outside of traditional gender roles (Mosso et al.,2022). Efforts to promote gender equality often involve challenging these long-standing stereotypes and redistributing household responsibilities more equitably.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the research findings on gender dynamics and sustainability of smallholder agricultural projects in Homabay County. The chapter makes conclusions from research findings. Additionally, the recommendations from findings are made, providing recommendations for practitioners and researchers.

5.2 Summary of the result findings

This section of research findings is presented in line with the objectives of the research.

5.2.1 Influence of gender roles on sustainability of smallholder agricultural projects

There was an insignificant positive effect of gender roles on sustainability of smallholder agricultural projects. Women did most domestic work at the farm houses. Men mostly made decisions on production processes in the farms decided on disposal of produce at the farms. There was an insignificant association between gender mostly involved in food crop production process, gender mostly involved in cash crop production at the farms, gender that makes decisions on production processes in the farms and sustainability of smallholder agricultural projects in Homabay County. All the respondents indicated that women did domestic work at the farm houses, hence no statistic. The relationship between gender that makes decisions on disposal of produce at the farms and sustainability of smallholder agricultural projects in Homabay County was significant.

5.2.2 Influence of gender relations on sustainability of smallholder agricultural projects

Results showed a significant and positive association between gender relations on the sustainability of smallholder agricultural projects in Homabay County. Cultural norms did not treat men and women equally in farming and women made fewer commercial decisions on use of land. The society did not encourage women to own land and neither did they equally participate in agriculture value chains. There were no equal opportunities between men and women in extension services.

5.2.3 Influence of access to resources on sustainability of smallholder agricultural projects

The study revealed a significant and positive association between access to resources and sustainability of smallholder agricultural projects in Homabay County. There was no free access to projects information to both men and women and there were unequal opportunities to join investment groups. Men and women were not given equal opportunities to access credit and there was unequal share of agriculture proceeds nor equal opportunities in agriculture training.

5.2.4 Influence of gender preferences on sustainability of smallholder agricultural projects

Findings revealed an insignificant association between gender preferences on the sustainability of smallholder agricultural projects in Homabay County. Women were mostly preferred in subsistence farming. Men were most preferred in cash crop production, agriculture produce marketing and had more access to agricultural inputs.

5.3 Conclusions

Gender roles have been a persistent factor in shaping the sustainability of smallholder agricultural projects, albeit with a relatively minor positive effect. In these projects, women are typically burdened with most of domestic work, often managing household chores alongside their farm duties. This division of labor often finds women predominantly engaged in food crop production, which, while vital for sustenance, may not always yield high financial returns compared to cash crop production. In contrast, men tend to focus on cash crop cultivation, which generates greater income potential. Crucially, decision-making power within these smallholder farms typically tilts in favor of men. They determine production processes and make choices regarding the disposal of agricultural produce. This power dynamic can have implications for the sustainability of these projects, as it may not always align with the best interests of the entire household or community.

Gender relations indeed exert a notable and constructive influence on the sustainability of smallholder agricultural projects. Regrettably, cultural norms continue to perpetuate gender disparities within the farming sector. Men and women are not treated equitably, and this imbalance is particularly evident in the realm of decision-making regarding land use. Women, often marginalized in this context, find themselves making fewer commercial decisions pertaining to land management and resource allocation. One of the deeply entrenched issues

lies in the societal reluctance to promote land ownership among women, perpetuating an uneven playing field. This gender-based exclusion not only hinders the progress of individual women but also curtails the overall sustainability of agricultural projects. Gender disparities extend to extension services, where women encounter unequal opportunities for support, training, and access to agricultural knowledge. This imbalance not only impedes their personal growth but also limits the effectiveness of extension services in fostering sustainable agricultural practices.

Access to resources plays a pivotal role in determining the sustainability of smallholder agricultural projects, and this connection is marked by its significant and positive association. However, gender disparities in resource access persist, impeding the realization of true sustainability. A glaring issue lies in the lack of free and equal access to project information for both men and women. Information is a vital resource, and when it is unequally distributed, it hinders the ability of marginalized groups, particularly women, to make informed decisions, plan effectively, and contribute to project success. Furthermore, there is a notable absence of equal opportunities for both genders to join investment groups, which can provide essential resources and support. These groups often play a pivotal role in resource allocation, knowledge sharing, and access to markets, but when gender biases restrict participation, it limits the potential for project sustainability. In addition, disparities in credit access further exacerbate the problem. Unequal access to credit opportunities denies women the financial resources they need to invest in their agricultural endeavors. This gendered financial exclusion can lead to reduced productivity and hinder project sustainability. Moreover, unequal sharing of agricultural proceeds and opportunities in agricultural training perpetuates gender imbalances within smallholder agricultural projects. Women often receive a smaller share of the proceeds, despite their significant contributions. The limited access to training opportunities also prevents them from acquiring the knowledge and skills necessary to improve agricultural practices and enhance sustainability.

The influence of gender preferences on the sustainability of smallholder agricultural projects has often been found to be relatively insignificant. Traditional gender roles tend to dictate the preferences for specific types of agricultural activities. Women are predominantly preferred for subsistence farming, which involves the production of food crops for immediate consumption by the household. This preference is rooted in cultural norms and historical practices. Men are more commonly preferred for roles associated with cash crop production, agriculture produce marketing, and access to agricultural inputs. Cash crop production typically involves crops that

generate income and are sold in the market, which is often perceived as men's domain due to economic and societal factors. Men are also more likely to have access to resources like land, credit, and modern farming technologies, further reinforcing their role in these aspects of agriculture. While these gender preferences exist, their impact on the sustainability of smallholder agricultural projects is limited because they are deeply ingrained in cultural norms and historical practices.

5.4 Recommendations for practice

Gender roles play a role in shaping the sustainability of smallholder agricultural projects, but their impact is often modest. These roles, which can assign specific tasks and responsibilities to men and women within the agricultural context, have historical and cultural roots. For instance, women may take on more domestic chores or be primarily responsible for food crop production, while men tend to engage in cash crop farming and decision-making processes. However, acknowledging these gender disparities is the first step towards enhancing the sustainability of agricultural projects. By doing so, the society can recognize that these roles may not always align with the best interests of the project, household, or community as a whole. It becomes evident that an equitable distribution of responsibilities, resources, and decision-making power is vital for sustainable development. To achieve true sustainability and maximize the potential of these projects, addressing these gender disparities is paramount. The ministry of youth, sports and gender in Homabay county could help foster good working relations amongst genders through public awareness and working with community leaders. Fostering greater gender equality in agriculture means empowering women with equal access to resources, opportunities, and decision-making authority. This shift can lead to improved project outcomes by leveraging the diverse skills and perspectives of both men and women. Additionally, it contributes to long-term sustainability by creating more resilient and adaptable agricultural systems that can better navigate the challenges of a changing world.

Efforts to address gender-relations challenges are not just beneficial but also pivotal for enhancing the sustainability of smallholder agricultural projects. Cultural norms that perpetuate gender disparities in agriculture, such as unequal division of labor and decision-making power, need to be rectified. The leadership at the sub county level in Homabay county should develop policies that give equal opportunities to both genders to agricultural extension services and market value chains. Promoting land ownership among women is critical to achieve gender equality, as it provides them with a stake in the agricultural enterprise and greater control over

resources. Moreover, equal participation of men and women in all aspects of farming, from crop cultivation to decision-making, ensures that diverse perspectives and skills are utilized effectively. Equitable access to extension services is equally crucial. When women are provided with the same opportunities for training, technical support and access to agricultural knowledge, they can contribute more effectively to the sustainability of agricultural projects. This inclusivity enables them to adopt improved farming practices, optimize resource utilization and enhance overall project outcomes.

Achieving sustainability in smallholder agricultural projects necessitates a deliberate effort to confront and correct gender-based disparities in resource access. It is essential to recognize that these disparities often hinder not only the individuals affected but also the overall sustainability of the projects themselves. Equal access to project information is crucial. When both men and women have access to the same information regarding project goals, strategies, and best practices, it empowers them to make informed decisions, plan effectively, and contribute more meaningfully to the project's success. This inclusive approach ensures that all stakeholders can actively engage in project activities, increasing the likelihood of sustainability. Local financial institutions and investment companies could help reduce gender disparities in resource provision. This, in conjunction with the county and national government could provide equal opportunities to both men and women to access resources for agricultural projects.

By ensuring equal opportunities for both men and women to join these groups, smallholder farmers can benefit from collective efforts to secure resources and access markets more effectively. Access to credit is another critical factor. Gender-neutral lending practices can provide women with the financial resources they need to invest in their agricultural activities. This empowerment enables them to adopt modern farming techniques, purchase quality inputs, and increase their productivity, thereby contributing to the sustainability of the projects. Furthermore, ensuring an equitable distribution of agricultural proceeds is vital. Although they frequently play important roles in farming, traditionally, women may only receive a smaller portion of the income. Their participation in agricultural projects will be encouraged to continue if this disparity is corrected, ensuring that their contributions are adequately recognized and appreciated. In agricultural education, equal opportunities are crucial. Both men and women can get the knowledge and skills required to advance agricultural techniques when they have access to training programs. This increases individual capacities while also jointly enhancing smallholder agriculture projects' sustainability.

Promoting sustainability and gender equality in smallholder agriculture demands a proactive approach to challenge and transform existing preferences and norms. The traditional preferences for specific gender roles within agriculture can hinder both the effectiveness of agricultural projects and the realization of gender equality. Non-governmental organisations and related stakeholders should challenge cultural norms and stereotypes that dictate gender-specific roles in agriculture. This involves working closely with community elders and the community at large to deal with traditions that encourage discrimination of either gender. It requires engaging with communities and stakeholders to create awareness about the benefits of gender equality in agriculture. By challenging these norms, there will be a more balanced distribution of responsibilities and decision-making power within agricultural projects.

Furthermore, promoting equal opportunities for both genders in smallholder agriculture extends to access to resources and support systems. The non-governmental organisations could advocate for policies and practices that enable women to own land, access credit and receive the same level of technical assistance and training as men. Gender-responsive policies can help level the playing field, ensuring that women can actively participate in all aspects of agriculture. This shift towards more equitable practices has the potential to significantly enhance the sustainability of smallholder agricultural projects. When both men and women are empowered with equal access to resources and opportunities, they can contribute their unique skills and perspectives to improve project outcomes. Gender equality in agriculture also fosters increased social cohesion within communities, as it values the contributions of all members, irrespective of gender.

5.5 Recommendations for further research

The study scope was confined to smallholder agricultural projects. Agriculture sector includes a wide range of activities such as large-scale commercial farming, agribusiness ventures, cooperative farming. By broadening the scope of research beyond smallholders, researchers can gain a more comprehensive understanding of the agricultural landscape, uncovering commonalities and differences among different types of agricultural projects. The geographical focus of the study was limited to specific regions, that is, Suba North, Ndhiwa and Rangwe sub-counties. Expanding the study's geographic scope to cover the entire county or even multiple counties would likely yield more robust and representative findings. This broader geographical perspective would enable researchers to account for regional variations, resource availability,

and local contexts, thereby enhancing the applicability and generalizability of the study's findings.

The study adopted a descriptive research design, which is valuable for providing an understanding of the characteristics and attributes of smallholder agricultural projects. However, alternative research designs, such as correlational research, could be employed to explore different aspects. For example, a correlational approach could assess the combined effect of gender roles, gender relations, access to resources, and gender preferences on the sustainability of agricultural development projects. This would enable researchers to evaluate the relationships among these variables, offering valuable insights for policy-making and project planning.

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APPENDICES

Appendix I: Letter of Introduction

Dear Participant,

I am pursuing a Master of Arts in Project Planning and Management at the University of Nairobi. My research project is on, "*gender dynamics and sustainability of smallholder agricultural projects in Homabay County.*" Kindly accept to be a participant in the study. This study will support formulation of project centered M &E interventions in UHC projects. The study's findings and recommendations will play a critical role in informing Homabay County government the gender dynamics that influence sustainability of smallholder agricultural projects, thus influencing their agricultural policies. There will be no risk, whatsoever, of your participation in this study.

Thank you.

ANNE AWINO OMAMO

L50/37374/2020

Appendix II: Questionnaire for Farmers

This questionnaire collects information on gender dynamics and sustainability of smallholder agricultural projects in Homabay County. Kindly respond to all questions appropriately.

SECTION A: GENERAL INFORMATION

Tick as appropriate.

1. Indicate your gender

- i. male
- ii. female

2. How old are you?

- i. 18-25 years
- ii. 26-35 years
- iii. 36-45 years
- iv. 46-55 years
- v. Above 55 years

3. Indicate your highest level of education

- i. diploma
- ii. bachelor's degree
- iii. master's degree
- iv. PhD

SECTION B: GENDER ROLES AND SUSTAINABILITY OF SMALLHOLDER AGRICULTURAL PROJECTS

4. Who do domestic work at the farm houses?

- i. males
- ii. females

4. Indicate the gender that is mostly involved in food crop production process

- i. males
- ii. females

5. Which gender is mostly involved in cash crop production at the farms?

- i. males
 - ii. females
6. Who makes decisions on production processes in the farms?
- i. males
 - ii. females
7. Who makes decisions on disposal of produce at the farms?
- i. males
 - ii. females

SECTION C: GENDER RELATIONS AND SUSTAINABILITY OF SMALLHOLDER AGRICULTURAL PROJECTS

8. In this section and subsequent sections, indicate by ticking you level of dis(agreement) with the statements.

Statement	5	4	3	2	1
Cultural norms treat both genders equally in farming production.					
Both genders make commercial decisions on use of land equally.					
The society encourages women to own land.					
Both genders equally participate in agriculture value chains.					
Both genders have equal opportunities in agricultural extension services.					

9. SECTION D: ACCESS TO RESOURCES AND SUSTAINABILITY OF SMALLHOLDER AGRICULTURAL PROJECTS

Statement	5	4	3	2	1
There is free access to agricultural projects information to both genders.					
Both genders have equal opportunities to join farmer investment groups.					
Both genders are given equal opportunities by financial institutions to access credit for agricultural projects.					
Both genders receive equal share of proceeds from agricultural projects.					
Both genders are given equal opportunities in agriculture training sessions.					

SECTION E: GENDER PREFERENCES AND SUSTAINABILITY OF SMALLHOLDER AGRICULTURAL PROJECTS

11. Which gender is mostly preferred in subsistence farming?

- i. men ()
- ii. women ()

12. Which gender is most preferred in cash crop production?

- i. men ()
- ii. women ()

13. Which gender is most preferred in agricultural produce marketing?

- i. men ()
- ii. women ()

14. Who has more access to agricultural inputs?

- i. men ()
- ii. women ()

15. SECTION F: SUSTAINABILITY OF SMALLHOLDER AGRICULTURAL PROJECTS

Statement	5	4	3	2	1
There're increased incomes from agricultural projects.					
There is stability in incomes from agricultural projects.					
The quality of farm produce is better.					
There is increased acreage under agricultural development projects.					
Farm size per household has increased.					

In your opinion, are smallholder agricultural projects sustainable?

- i. yes
- ii. not sure
- iii. no

THANK YOU

Appendix III: Interview Guide for Project Managers

This interview collects information on gender dynamics and small holder agricultural projects' sustainability in Homabay County. Kindly respond to all questions appropriately.

1. How long have you been manager of agricultural development projects in Homabay County?
2. How do gender roles influence the small holder agricultural projects' sustainability in Homabay County?
3. Are there any inequalities in gender roles in agricultural development projects in Homabay County? If yes, please explain.
4. How do gender relations influence smallholder agricultural projects sustainability?
5. What is the influence of access to resources on smallholder agricultural projects sustainability?
6. Are there any gender inequalities in access to resources in agricultural development projects in Homabay County? If yes, please explain.
7. Are there any gender preferences in participation in agricultural development projects in Homabay County? If yes, please explain.
8. What challenges hinder the small holder agricultural projects' sustainability in Homabay County?
9. How can these challenges be overcome?

THANK YOU

Appendix IV: Krejcie & Morgan (1970) Table

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Appendix V : NACOSTI Letter

Attached