EFFECTS OF PARTICIPATION IN GROUPS ON WOMEN INVOLVEMENT IN AGRIBUSINESSES IN NJORO AND MOLO SUB-COUNTIES IN NAKURU COUNTY, KENYA

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A Thesis Submitted to the Graduate School in Partial Fulfilment of the Requirements for the Master of Science Degree in Agribusiness Management of Egerton University

EGERTON UNIVERSITY, NJORO

SEPTEMBER, 2024

DECLARATION AND RECOMMENDATION

Declaration

This thesis is my original work and has not been presented for an award of a Diploma or Conferment of any Degree in any University.

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Recommendation

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DEDICATION

With love and gratitude I dedicate this work to my loving dad Martin Engurat, Aunt Jasitina Amase, my son Theodore Josphat Jr. and to my husband Mr. Josphat Maoga who always prayed and gave me moral support to study.

ACKNOWLEDGEMENTS

I am deeply grateful and indebted to Mastercard@RUFORUM through TAGDev Program at Egerton University led by Prof. Nancy Mungai for the full support they have given me since I started this degree program, TAGDEV has been a family and my support system in all aspects of life through this phase. I am also grateful to my supervisors Prof B.K. Mutai and Prof. George Owuor for their scholarly support, guidance, suggestions and all the inputs. This research has been successful because of the generous time devotion and tireless contribution from my supervisors. I also want to acknowledge the entire staff of the Department of Agricultural Economics and Agribusiness Management, Egerton University for their help and support throughout my studies. Special thanks also to Prof. Hillary Bett, the Chairman of the department for his support and advice. Thank you Professor.

My special gratitude also goes my enumerators, Lilian, Calvin, Peninah and Ogamba who sacrificed a lot in collecting the data used in this study. To all the female respondents in Njoro and Molo Sub-Counties, who took their precious time and volunteered information making it possible to achieve this research, I am really thankful. I am also grateful to all my friends and especially my classmates, AGBM 2021 class for their kindness and moral support during the entire period of my study. I would like to express my sincere appreciation and gratitude to my family especially my dad Mr. Martin Engurat, my brothers and sisters and my husband for their special strength in standing by my side, besides their words of encouragement and inspiration, which made the study a success. Above all, Honour and glory to Almighty God for His mercy, grace, strength and opening the way for me. The Lord gave me the wisdom, guidance and power to sail through during the entire period of study.

ABSTRACT

The Kenyan government has been promoting participation in groups to enhance agricultural productivity through marketing and financial access to improve livelihoods. Groups have also been valued for their ability to foster social capital and collective actions. However, women's involvement in these groups has not been primarily focused on and taken seriously. Although previous researchers have clearly shown the importance of participation in groups, the effect of this participation on agribusiness involvement is still unknown. This study, therefore, intended to characterize women agri-preneurs, to determine the factors that influence women's participation in group and to determine the effects of women's participation in groups on involvement in different agribusinesses lines. The study was conducted in Njoro and Molo sub-counties in Nakuru County. A multistage sampling technique was employed to sample 267 female in agribusinesses, both group participants and non-participants. Pretested semi-structured questionnaires were used to collect primary data. Data processing was done using STATA and SPSS software. Descriptive statistics characterized female agri-preneurs while Binary Logit Model determined factors influencing women's participation in groups. The standard Poisson regression model examined the effect of women participation in groups on their involvement in different product lines. This study helps policy makers to make necessary decisions in supporting female agri-preneurs and participation in groups, in Nakuru County in Kenya. Results revealed that savings as a source of fund, shows that 0.93 (or 93%) of non-participants (No) rely on savings, with a standard deviation of 0.26. This means that the proportion of non-participants relying on savings varies from 0.67 to 1.19. Similarly, 0.88 (or 88%) of participants (Yes) rely on savings, with a standard deviation of 0.32. There is a higher proportion of non-participants (0.93) than participants (0.88) who rely on savings as a source of funding. However, the difference is relatively small. Participants in a group are more likely to hold leadership positions (0.21) compared to non-participants (0.08). The major factors influencing participation in groups were size of agribusiness enterprise and loan access. Age, education level, leadership position, size of agribusiness enterprise, time taken in agribusiness activity and loan access were statistically significant in ($P<.05$) to the number of agribusiness product lines owned. The study recommends need for government support to involve women agri-preneurs in policy making in participation in groups, making it successful for most agribusinesses in Kenya.

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LIST OF ABBREVIATIONS AND ACRONYMS

AGRA	Alliance for a Green Revolution in Africa
ASCAS	Accumulating Savings and Credit Associations
ASD	Agenda for Sustainable Development
AVC	Agribusiness Value Chain
CAADP	Comprehensive Africa Agriculture Development Program
CDIP	County Integrated Development Plan
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organization of the United Nations
GAVC	Global Agribusiness Value Chain
GDP	Gross domestic product
GEM	Global Entrepreneurship Monitor
GGGR	Global Gender Gap Report
GoK	Government of Kenya
MDGs	Millennium Development Goals
MSMEs	Micro, Small, and Medium Enterprises
NBR	Negative Binomial Regression
NGOs	Non-Governmental Organization
ROSCAS	Rotating Saving and Credit Associations
SACCO	Savings and Credit Cooperative Organizations
SDGs	Sustainable Development Goals
SET	Social Exchange Theory
SVB	Silicon Valley Bank
TAA	Total Entrepreneurial Activity
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
WEF	World Economic Forum
ZIMB	Zero-Inflated Negative Binomial (ZINB)
ZIP	Zero-Inflated Poisson (ZIP)

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Agribusiness is one of the sectors of paramount value for the country because many resources and materials change their forms due to links between actors involved in agribusiness supply chains (Rocha *et al*., 2021). Agribusiness involves industries and services that comprise supply chains from after-production through processing, wholesaling, and retailing. Agribusiness has created employment opportunities and income generation, to many especially youths and women who get involved in agribusiness activities (Yami *et al*., 2019). The agribusiness concepts, and theoretical frameworks related to it have always been associated with value chains. Agribusiness value chains (AVC) refer to all activities needed to move a product or a service from conception via different stages of production, final consumer delivery, and disposal after use. Agribusiness Value chains embrace the concept of input-the output model (Clay *et al*., 2019). Most developing countries have developed institutions and reforms to support agribusiness value chains. For instance, Kenyan Government launched Kilimo Biashara (Agribusiness) campaign to promote these value chains (Mbata, 2019).

As more countries participate in agribusinesses, Global Agribusiness Value Chains (GAVC) enables it to satisfy the global demand for food and other agricultural materials (Fernandez *et al.*, 2019). Global agribusiness value chains result in internationalization, leading to wealth and employment creation, foreign exchange, proper nutrition, poverty elimination, and food safety and security. It also expands on markets for the products (Kiniaru, 2014). The Agribusiness sector also ensures the fulfillment of the Millennium Development Goals (MDGs) and a food-secure society globally (Abiodun, 2021). The Agribusiness sector also fights global food insecurity and malnutrition by extending food shelf life (Mweberi, 2020). Adoption of the 2030 Agenda for Sustainable Development (ASD) by the United Nations (UN) General Assembly that comprises 17 Sustainable Development Goals (SDGs) that need transformation changes in agribusiness value chains towards social, economic, and environmental sustainability (Hinson *et al*., 2019). There have been notable shifts in global production, distribution, and consumption of food due to transformations in agribusiness global value chains (FAO & UNICEF, 2019).

In Kenya, agribusiness sector still remains an important part for economic growth and development. This is through ensuring food security, creation of job opportunities and acts as a

source of revenue (Maslon *et al*., 2021). A well planned shift from agriculture to agribusiness is required to revitalize the sector and meet the demands of the ever growing Kenyan population through diversification such as value addition and exploitation of entrepreneurial opportunities (Ouko *et al*., 2022). Despite agribusiness playing a key role in the Kenyan economy, this sector faces various challenges such as lack of know-how, inaccessibility to affordable employees and the majority groups such as the youths having fixed mindset. As a result of these challenges, Kenya through the National government and the county governments have tried to come up with policies and actions that support agribusiness involvement (Maritim, 2020).

According to Nakuru County Integrated Development Plan, agribusiness activities are the main source of revenue to the County government. However, there are more male participants in the listed agribusiness activities than women in the County, despite the fact that women play a significant role in the same activities informally and also dominate in the population of the county. Both small and medium size agribusiness enterprises exist in this county with a few large enterprises. Njoro and Molo Sub-counties have been classified as those regions that are very suitable for agricultural activities and most agribusiness activities. Women from these areas participate in groups and play a big role in ensuring that agribusiness activities remain effective. However, most of the micro and medium enterprises from there two sub-counties are unregistered only with a few registered (Nakuru CIDP, 2018).

Private firms, especially small and medium-sized enterprises, are the leading agents of inclusive agribusiness initiatives because of their ability to raise and apply capital and economic interests' promotion (Schelle *et al*., 2021). Agribusiness focuses on enterprises related to agriculture with roles such as processing, marketing, and retail sales. In the 21st Century, agribusiness firms' and enterprises' survival, competitiveness, and financial capability depend on their ability to adapt to the changes surrounding the firm. The environment surrounding agribusiness firms keeps fluctuating regarding policy, technology, value chains, and society. Therefore, for these agribusiness firms to embrace sustainability, they must adopt coping strategies to survive and accommodate the changing environment (Gachuhi & Awuor, 2019). Agribusiness firms and enterprises face the challenges of relatively few people interested in working in the agribusiness sector. Despite agribusiness knowledge and skills being well-developed at the secondary and tertiary education levels (Kozera &Uglis, 2021).

Women play an essential role in economic development through agribusinesses in the rural economy, especially growth in the Gross Domestic Product (GDP). However, women agri-preneurs face more challenges in starting, managing, and making decisions in agribusiness enterprises. These challenges include; inaccessibility and ownership of assets, social-cultural hindrances, versatility factors, and illiteracy in terms of innovation and market innovativeness (Nedumaran, 2019). These challenges faced by women agri-preneurs, therefore, call for participation in groups. Involvement in groups plays a vital role in the operation and success of many firms and enterprises today. Working as a group is essential for the participants, for it acts as an ingredient on and off the race track (Harris & Sherblom, 2018). To reduce high transaction costs associated with input and output market participation resulting from information asymmetries and limited access to credit, which can be responded to collectively through participation in groups (Abdul & Abdulahi, 2018).

Participation in groups has been linked to increased food security and easy access to resources like finances, markets, skills, and knowledge. Groups are potential avenues that facilitate input-output needs and minimize inefficiencies in these markets (Ingutia & Sumelius, 2022). Women agri-preneurs who participate in groups may acquire skills and empowerment through training and information exchange that occur in such groups for economic development. Despite women engaging actively in these groups, it is still unclear if women have imparted enough agribusiness skills to start and grow their enterprises. Studies have been done on the role of women groups in enhancing social welfare (Borchorst & Siim, 2018). Yet, many of these studies have not adequately captured the aspect of groups enhancing agribusinesses. Therefore, this study aimed at determining if participation in groups by women affects involvement in agribusinesses.

1.2. Statement of the Problem

Formation and participation in groups are seen as possible institutional solutions that would help overcome market-related failures like high transaction costs among agribusinesses. The concept of group formation has a long history from the Colonial period when cooperatives were developed with different objectives. There has been a rise in stakeholders championing group formation, (in particular women and youth groups) to respond to additional trading measures along the agribusiness value chain. Studies have shown that groups help respond to efforts on quality and safety standards and ever-changing procurement systems. Groups also create avenues for capacity building and skills development, enhancing agribusiness experts' bargaining

positions. Several studies have analyzed the role of attitudes and preferences on the functioning of groups, impact of groups on: market access, credit access, and technology adoption. Despite the many studies on the role of groups in women's transformation, there still exists scanty literature on the role of participation in groups in ensuring women are involved in agribusinesses. This study, therefore, sought to fill this knowledge gap by studying the effect of women participation in groups on their decisions to involve in agribusinesses.

1.3. Research Objectives

1.3.1. Overall Objective

The general objective of this study was to contribute to improved livelihoods of women agri-preneurs through enhanced participation in groups by determining the effect of their participation in groups on involvement in agribusinesses in Njoro and Molo sub-counties in Nakuru County, Kenya.

1.3.2. Specific Objectives

i. To characterize women agri-preneurs in Njoro and Molo sub-counties in Nakuru County
ii. To determine the factors that influence women participation in groups in Njoro and Molo sub-counties in Nakuru County
iii. To determine the effects of women participation in groups on their involvement in different agribusinesses lines in Njoro and Molo sub-counties in Nakuru county

1.4. Research Questions

i. What are the characteristics of women agri-preneurs in Njoro and Molo sub-counties in Nakuru County?
ii. What factors influence women participation in the groups in Njoro and Molo sub-counties in Nakuru County?
iii. What are the effects of women participation in groups on their involvement in different agribusinesses lines in Njoro and Molo sub-counties in Nakuru County?

1.5. Justification of the Study

Agribusiness offers the opportunity to many rural people, especially women and youth. There has been a growing commitment to intensively involve women in agribusiness. The many initiatives governments can show this has implemented to ensure this course. Nakuru County Integrated Development Plan [CDIP] 2018-2022 stipulates that there is a need to invest in groups

such as the cooperatives and SACCOs to enhance entrepreneurship-oriented research and enhance bargaining power and access to local and international markets through groups (NCIDP, 2018). The significant population in Nakuru County relies on business income for livelihoods. These businesses can be micro, small, or medium-level enterprises (MSMEs). Agribusiness has been thriving in this county, as shown by the collected revenue from trade licenses. However, out of the indicated 118200 licensed and 257900 unlicensed MSMEs, women own a small proportion of 32.2 percent while the men hold the more significant proportion. Nakuru County has 828 registered Cooperatives; most of them aim to market farm produce.

The county has also been targeting to continue carrying out SACCO empowerment through workshops and capacity-building forums. Nakuru County has also been facilitating the growth and development of groups through the revival of collapsed cooperatives, pieces of training, groups' factories rehabilitation, and improvement groups' governance. The Kenyan government also, through Uwezo Fund, aims to promote financial access to women and youths, thus enhancing the efforts towards realizing the Kenya vision 2030. This research also explores gaps for further investigation. For instance, Comprehensive African Agriculture Development Programs (CAADP) (AGRA, 2016) for African countries and SDG 1 (eradicating poverty) and SDG 5 (promoting gender equality and women empowerment). Groups have been recorded to be avenues for skills and resource access. Groups provide training opportunities for skill development, resource access, and technology transfer. Although there have been increasing efforts to involve women in agribusinesses through groups, there is a dearth of evidence of successful agribusinesses established courtesy of groups. This makes it difficult to inform evidence-based policy-making and create proper interconnections for women in agribusiness. This study conducts critical research on the role of engaging in groups in ensuring successful agribusiness among women. The results also help to improve the implementation of the existing interventions and design future interventions. This study also enhanced the body of literature on women's participation in agribusinesses as a future reference for future studies.

1.6. Scope and Limitation of the Study

This study focused on the effect of participation in groups on women's involvement in agribusinesses. The study was be carried out in Njoro and Molo Sub-counties as a representative part of Nakuru County because according to the Nakuru CIDP the two sub-counties fell under Zone 3, which receive rainfall of between 1100 and 1400 mm per annum and covers areas with

an altitude of between 1800m-2300m above sea level and were very suitable for agricultural activities. The agricultural activities provided the products needed for agribusiness activities. The research also focused on both women participating in groups and those with no groups as respondents, provided they are involved in agribusiness activities. The study was carried out in March 2023 in the identified Njoro and Molo sub-counties.

The study was focused on the difference in agribusiness diversification between female agri-preneurs participating in groups and those that do not participate. The specific issues of interest in this study were the size of enterprises, type of business, income, credit access, market access, technology access, resource ownership, source of funds, and the number of business lines a female agri-preneurs operates in. Due to time constraints, the study only looked at the above mentioned variables and focused on only women.

1.7. Definitions of Terms

Agribusiness diversification: Referred to the number of agricultural product lines that a female agri-preneurs participated in.

Agribusinesses: Any activities that involved marketing, value addition, and distribution of farm produce.

Credit access: Referred to the ability of a female agri-preneurs to get a loan with or without collateral either from a group, a financial institution, or an individual.

Participation in groups: This referred to a broader term that simply describes the act of being involved in a group. It doesn't specify the level or quality of involvement.

Group: This was a primary-tier association of female agri-preneurs at the community level on their primary goals, such as marketing, value addition, and distribution.

Women: Referred to any female beyond 20 years and was involved in agribusiness activities

CHAPTER TWO

LITERATURE REVIEW

This section shows the relevant literature on women's participation in groups, women's involvement, and the effect of participation in groups. It also explains studies related to this study.

2.1. Characteristics of Female Agri-preneurs

According to Djomo *et al*. (2021), it is complex to provide accurate contributions of women to agriculture and agribusiness due to lack of enough records and evidence. However, it is estimated that women play a key role in ensuring there is food security in the world. Women's involvement in agribusinesses in the current world is one of the main factors contributing to the country's growth and the entire global market altogether. However, female agri-preneurs still own and manage significantly fewer agribusiness enterprises than men (Elam *et al*., 2019). Especially women in developing countries face many limitations and discriminations compared to male agri-preneurs. Women agri-preneurs in developing countries are also associated with low education and skill training. Another major drawback for women agri-preneurs in developing countries like Kenya is the safety and security of women, especially those women operating in the informal economy. Despite all these challenges faced by female agri-preneurs, they are motivated to start and manage their agribusiness enterprises out of necessity taking into account the high unemployment rate and dissatisfying existing employment (Rodavic *et al*., 2018). Agri-preneurs are described as aggressive and high-risk takers for economic benefits, which does not fit women because female agri-preneurs seem to pursue social value because of their care and emotional attributes (Cardella *et al*., 2020).

Female agri-preneurs are 63 percent less likely to obtain external financing in terms of risk capital than their male counterparts. Female agri-preneurs also have more responsibilities associated with family and work. Balancing family-work roles with business roles is an obstacle to their enterprises' growth (Guzman & Kacperczyk, 2019). Conflicts women face at work and in the family also motivate women to start agribusiness enterprises because of flexibility in terms of work hours and income variation (Cardella *et al*., 2020). Female agri-preneurs also face the challenge of accessing diverse forms of capital compared to their male counterparts, that access capital efficiently. Women fail to obtain full institutional, family, and financial because of fear of failure, self-assessment of the gender gap, and unfavorable perception socially (Wieland *et a*l.,

2019). Traditionally, women have been excluded from contractual agreements and agribusiness with the private investors and this is linked to their inability to access land and ownership of economic capital. Women also face many difficulties securing markets as compared to the male counterparts (Djomo *et al*., 2021).

However, despite the challenges faced by female agri-preneurs, there has been a significant increase in the number of women who participate in agribusiness activities. However, it will take another 108 years to close the gender gap between men and women altogether. This is confirmed by the Global Gender Gap Report (GGGR) 2018 published by the World Economic Forum (WEF) (2018) and World Economic Forum (2020). According to the Global Entrepreneurship Monitor (GEM) 2018/2019, in female agri-preneurship, the majority of women startups are less than 5 percent of the Total Entrepreneurial Activity (TAA) (Bosma &Kelley, 2019). The same outcome was given by the startup outlook 2018 survey published by Silicon Valley Bank (SVB) (2019). Most agribusiness firms do not have women on board or in top management positions. Also, very few female agri-preneurs are co-founders in agribusiness firms around the whole globe (Cardella *et al*., 2020). This was also related to the study that was conducted by Fani *et al*. (2021) on assessment of performance of female and male entrepreneurs in agribusiness that states that the growth of female agri-preneurship has lagged behind when compared to the male in many developed and developing countries.

2.2. Nature and Structure of Participation in Groups

The structure and the roles played by participating in groups are always shaped by factors such as historical, political and as well as the social context in which the group operates in. Participation in groups therefore differ widely from region to region according to the study that was conducted by Wortmann (2019). Collective action through participation in groups effectively increases welfare, technology adoption, and market participation among agri-preneurs. Participation in groups also plays a vital role in rural development by supporting smallholders. It also acts as channels through which Non-Governmental Organizations (NGOs) support the less resource-endowed people, especially in rural areas. Most developing nations have actively promoted groups' development by making collective action part of development agendas (Sinyolo &Mudhara, 2018). For instance, the government of Kenya (GoK) has been investing through the women's enterprise funds, Uwezo Fund, and the Youth Enterprise fund to

ensure sustainable development. These programs also target women and young people by involving them in starting and operating agribusinesses (Nyangweso & Wambua, 2018).

Research by Wanaina (2012) stated that group investments are more beneficial than individual investments because the group members share costs and risks. He also elaborated more on how large business enterprises have originated from group investments due to significant assets and other resource acquisition through participation in groups. Participation in groups leads to the increased creation of small and medium-sized agribusinesses (Ogutu *et al*., 2020). Agricultural and agribusiness groups are cooperatives, self-help, and women's groups and associations, especially in developing nations like Kenya. These groups may either focus on one purpose or multipurpose. They may concentrate on input supply, marketing, savings, welfare, credit services, or multiple (Buzikova *et al*., 2020). Groups function effectively depending on the group setting, structures, and norms. These factors classify groups as either formal or informal (Wilson *et al*., 2018).

Informal groups do not have a fixed structure, allowing different members to lead depending on the matter. In case there is a well-defined leadership structure, it is not documented in most cases. Rotating Saving and Credit Associations (ROSCAs), Chamas, Merry-Go-Rounds, and Accumulating Savings and Credit Associations (ASCAs) are examples of informal groups that exist in most developing countries using different names (Lukwa *et a*l., 2022). For instance, in Nigeria, it's called Ajo, Mukando in Zimbabwe, Muzikis and Chama in DRC and Kenya respectively, Chits in India, Tandas in Mexico, and Susu in Ghana (Kukwa *et al*., 2022). These informal groups play a significant role in influencing the participation of women in agribusinesses through the creation of capital markets, promotion of a savings culture among women, property ownership, and involvement in decision-making (Nderitu *et al*., 2018).

Formal groups such as registered cooperative societies and any other formal groups in an organization play a specified role that is known to all members. According to Odhiambo (2019), Savings and Credit Cooperative Societies in Kenya help in promotion of economic growth and development through poverty elimination, job opportunities creation, food security and encouraging savings culture. Although groups receive support from governments and other organizations, groups also face poor performance as a result of inadequate resources since most of them are struggling to provide financial services to members such as loans requested by members.

2.3. Determinants of Women's Participation in Groups

About 200 million people participate in groups across developing countries (Greaney *et al*., 2016). The majority are women and youths involved in agribusiness on small and medium scales purposely to cater to their families. Most women are interested in agribusiness for either commercial or domestic used purposes. Women's involvement is essential in agribusiness, and when empowered, there is an increase in agribusiness output. Women employed in the sector to boost food security groups have become the most popular way of bringing together women to achieve a common goal (Emery *et al*., 2016). There differed factors affecting them to join or discouraging them from joining groups and agribusiness. The desire for economic independence plays a vital role in joining a group and agribusiness. Women see agribusiness as one of the ways that will see them free from depending on men and other financially stable people. Joining the group will lead to better knowledge and access to financial aid through loans and grants to increase their agribusiness enterprise (Bwiru, 2020). Economic independence encourages women to join formal or informal groups because all individuals need to be self-reliable, provide for their families and themselves, and improve their country's economic status. When the group achieves its goal economically, members gain in terms of produce, sales and knowledge shared among the members.

According to the study by Kumar *et al.* (2021), women's participation in groups is beneficial for developing an economy's social and financial sectors; this is achieved through self-help groups in India supported by the government, which eventually become agribusiness groups. This is because the women are empowered through groups and encourage each other as they carry out group activities. Research (Moreka, 2019) found that capital access encourages more women to participate in agribusiness groups because it is easier to get a loan or grant as a group than as an individual. Therefore, women find it beneficial to join or form a group to acquire land from financial institutions, government, and international fund aids directed to agribusiness. Agribusiness needs a lot of funds, and it is hard to raise funds as a woman; therefore, it encourages women to come and work as groups to access capital for agribusiness startups or expansion. It is evident from the study that 95% of the participants applied for loans but were unsuccessful, and those in groups are in a better position to get financial services from both government and financial institutions (Moreka, 2019).

Women joining farmer groups is influenced by access to credit. Credit advancement to farmers is vital and is connected to collateral. Accessing a credit facility as an individual farmer is almost impossible unless you have collateral. Therefore joining a group will help women access credit facilities available for women and agribusiness players in the sector (Ingutia & Sumelius, 2022). The same research also found that land ownership was a barrier to women joining groups to boost their agribusiness. The land is an essential requirement in agribusiness, and if not allowed to own it. Limited access to women when utilizing the land and using the same land for credit access and developing it for agribusiness because you do not have full rights as those of the land owner (Ingutia & Sumelius, 2022). This is also related to a study that was conducted by Kavulya *et al*. (2018) on the performance of SACCOs in Kenya, that indicated that majority of members who participate in SACCOs in Kenya are male with low proportion of women.

Social and cultural factors are determinants of women's participation in group agribusiness. In most cultures, women are viewed as domestic workers who should be prioritized in domestic's roles like cleaning, cooking, and taking care of children and leave the rest of the outside responsibilities to men. These norms affect women's skills and knowledge concerning agribusiness (Efanodor, 2020). The same culture also prohibits women from owning crucial resources like land and other properties that can be used as collateral when accessing loans, making women get loans when applying. The research indicates those cultural practices discourage women from participating in agribusiness. Hence joining the group becomes challenging because they will not be allowed to own land, which is a crucial tool for agribusiness, and they have limited time due to undertaking all domestic responsibilities. (Efanodor, 2020).

Despite the findings from research on the determinants of women's participation in groups for agribusiness purposes in different regions, they did not exploit all the factors, and each area has different characteristics. It is good to conduct research on the specific part to know the exact factors women consider before deciding whether to join or not to join the agribusiness groups. Therefore, it was essential to research which core factors affect the women in Nakuru County regarding participation in groups.

2.4. Effects of Women Participation in Groups

Kumar *et al*. (2021) elaborate on how the participation of women in groups expands their roles in agribusiness through decision-making, wealth creation, and generating demand for governmental and non-governmental programs**.** A related study in Kena conducted by Fischer and Qaim (2012) on small-scale banana producers concluded that participation in groups positively impacts income share controlled by women producers when women are involved in agribusiness activities. The study by Oumer *et al*. (2014) in Ethiopia also shows that women's participation in groups has significantly improved knowledge and skills through the collective capacity necessary for agribusiness undertakings. Groups plan and engage in skills and knowledge sharing by training their members on the best and most innovative agribusiness practices for better results. The group members share ideas as they meet and share knowledge leading to better management of the enterprises.

Alemu *et al*. (2019) clearly explain how women's participation in groups results in empowerment, especially at the community, national and international levels. Groups give a conducive environment for women to share information on the best practices of agribusiness; the best ways to manage their enterprises. Through groups, women get to enlighten on their rights as women and agribusiness entrepreneurs. Participation in agribusiness groups created employment opportunities for both youths and women in Nigeria. Groups have positions that need mender to carry out and are paid to manage the running of the group activities towards achieving its goals and objectives. The agribusiness activities need people to work on, and the priority is given to members and their close family members hence creating employment that improves the lives of the group participants. Increase in income for group participants, which indicates the positive impact of participation in groups (Ogunmodede *et al*., 2020).

Participation in groups in agribusiness leads to poverty reduction. There is the creation of employment opportunities, increase in income, and food security due to increase agricultural production and yields employment opportunities leading to earnings due to rendering labour services and offering training to fellow group members. Increased income is associated with increased sales from agribusiness activities due to market access. Food security is paramount when it comes to poverty reduction because the availability of agricultural produce ensures a healthy society with fewer diseases associated with a lack of balance diet (Osabohien, 2021). Participation in groups increases agribusiness activities and boosts the economy in other community sectors, national and international levels, hence higher per capita. Community

development is accelerated by participation in groups in agribusiness sector, because there is development in water, road network, communication, and real estate for housing purposes within the Community. Development is necessary to ensure market accessibility, water for irrigation and domestic use, and shop and market to store and sell agricultural produce. When there are achievements of group goals and objectives, society also benefits in different ways due to the agribusiness increase in the areas due to increased participation in groups (Olokundun *et al*., 2014).

The women's participation in groups positively affects the saving behavior and trend in Ghana. Women in agribusiness groups encourage and motivate each other to implement the culture of saving in the money box and open it at an agreed time by members. This way, there was an improvement in the welfare of women in groups due to saving culture. The percentage of income from the agribusiness saved is used to invest and buy essential households without depending on well-wishers hence elevating the living standards of women in society (Karakara *et al*., 2021). Through groups, women are free to make wise decisions since they are trained and given the necessary skills to make intelligent and informed decisions regarding agribusiness matters and other matters affecting their lives. This is one way of empowering women to help in the Community, national, and even international capacity building for all gender-inclusive societies. Also, there is an advantage of coming to agribusiness women in terms of economies of scale when purchasing inputs.

Liverpool-Tasie (2012) highlights in his study that participation in groups helps women participate in agribusiness activities to pull their resources together, search for a joint market for their products, and reduction in transaction costs associated with economies of scale. This is also highlighted by the study that was conducted by Mutonyi (2019) that stated that participation in groups, results from the challenges that small and medium size enterprises face especially in Africa and Asian countries. Small and medium scale holders experience high level of poverty due to limited access to market opportunities which is linked to high transaction costs and imperfect markets. Access to either domestic or international markets is achieved by increased bargaining power, increased economies of scale, negotiation for better prices, facilitation of certificates and labels. Mutonyi (2019) also elaborates how groups receive more support from Non-Governmental Organizations, donor agencies and governments through collective action. A study that was conducted by Ombogoh *et al*. (2018) states that participation in groups is central

to adoption of various scales of decision making. It also states that the success of the group depends on the institutions and policies that exist in environment that the group exists. However, despite all the benefits related to participation in groups discussed earlier, there is a contradiction in terms of the level of participation in groups as shown by the study done by Twine *et al*. (2019) states that membership of groups by some sections of the rural agri-preneurs remains low and the success rates of the existing groups is also low.

2.5. Theoretical Framework and Conceptual Framework

2.5.1. Theoretical Framework

Several theories have been identified and used by different researchers on participation in groups for instance theory of utility maximization, social exchange theory by Homans, collective action theory among others. This study used Social Exchange Theory (SET) to relate women participation in groups to women's agribusiness involvement because of the following discussions:

Social Exchange Theory

This study was based on the Social Exchange Theory (SET). George C. Homans identified this theory in 1958. Homans was an American sociologist who established his argument on the reward-cost outcome of participation in groups. To participate in a group, a member thinks about what they will gain in exchange for interactions with other group members. There must exist a minimum positive reward as a result of participation in groups. According to this theory, a person's actions in a given group interaction have a specific expectation that influences behavior. For instance, when people receive the expected reward for their actions, they are pleased and act approvingly. On the other hand, a person will be dissatisfied and exhibit aggressive behavior when their efforts do not meet the expected reward of participation in groups. Individual people's behavior influences group performance and helps non-members to understand it.

Social interaction such as different agribusiness involvements leads to benefits of exchange in material or non-material things such as money, network, power, time, and effort, among others. These interceptions can generate rewards or benefits. The higher the interactions the higher the likelihood of getting more benefits. Many sociologists other than Homans who have advanced on Social Exchange Theory (SET) include Peter Michael Blau, who focused on concepts such as

interests, preferences, indifference curves, and supply and demand. The assumptions associated with this theory include the following; People participate in social exchange when they receive more benefits than costs. The gains of social interactions can be material or non-material. People are motivated in participation in groups when they retain some value (reward) after giving up something (cost). Social behavior entails social exchanges of worth. People compare their

previous experiences, alternatives, and expectations when measuring value to reward against cost. People will terminate group interactions when they are convinced that costs are more significant than benefits. Sometimes people who incur the exact costs in social interactions expect to be rewarded equally (equity of exchange). Average rewards compared to costs keep changing from one social relationship to another and within the same relationship over time.

Social Exchange Theory (SET) applies to group decision-making, behavior, leadership, and social power. This theory is relevant in this study because of the following: Female agri-preneurs understand that every group member is looking for benefits within group interactions; hence the group aim will be driven towards rewarding the participants. Group members look for more positive outcomes from group interaction than adverse outcomes. People tend to repeat their actions when they receive rewards for those specific actions. For this case female agri-preneurs may tend to be group participants without leaving when the groups benefit them continuously as a result of being participants. The five principles that guide the social exchange theory are: Principle 1**:** Social behavior can be explained in terms of costs, rewards, benefits and exchanges. Principle 2: People seek to maximize rewards and minimize costs in relation to the greatest benefits: this shows a belief that people are mostly motivated by their own self-interest, regardless of the decision. Principle 3: Social interaction involves two parties, each exchanging a reward needed by the other person. This creates interdependent relationships especially in groups. Principle 4: Social exchange theory can be used to explain the development and management of interpersonal relationship. Principle 5**:** Social exchanges affect the relationships among members of groups and organizations.

For decades, researchers such as Blau (2017) have discussed how the need for advice and assistance leads to exchanges among group members. Therefore in group structures, as those who are able to give advice are rewarded with respect, prestige, or possibly reciprocal action from the person receiving the assistance. This theory is therefore related to this study because every female agri-preneurs who chooses to participate in groups should gain from their

participation regardless of the costs incurred. The decision of female agri-preneurs to participate in groups or not is influenced by the rewards gained through such interactions with other group members. For instance, female agri-preneurs may incur costs and time, and the expected gains may be easy access to credits, training, power, leadership, and accessible markets. These rewards will therefore result in increased diversification and growth in agribusinesses among female participants. This therefore qualifies this theory for this study.

Collective Action Theory

Collective Action Theory (CAT) was published in 1965 by Mancur Olson. Mancur Olson argued that members participating in groups have a challenge of providing public goods efficiently because some individuals tend to "free ride" on the efforts of others in groups. Olson also argues that, every individual member in a group may have different interest as compared to other members. Collective action theory is important for it allows people or individuals to work together as a team to make change that would have not been possible to be made by an individual member. The benefits related to this theory includes: collective bargaining rights, favourable working environment, and transaction costs reduction among others. This theory is limited by the conflict between the individual members' interests and the group interest. For this case, each individual group member in the group is subjected to either choose to cooperate or act selfish to meet his/her own interests.

Collective Action Theory mainly applies when individuals with the same goal decide to work together for a common goal. Although there is always a clear goal for every collective action, individual members always fail to achieve the common goal. Olson suggested eight principles that make collective action theory successful. These principles includes: existence of clear boundaries, collective choice agreements with participation of all group members, equivalence between the costs and benefits of participating in collective actions, efficient monitoring, clear gradual sanctions, well established conflict management mechanisms, legitimacy of internal norms face to face to external factors and forces and different multiple layers of embedded enterprises in the bigger groups.

This theory is therefore related to this study since it helps to explain the behaviour of individual women agri-preneurs who participate in groups towards achieving the common goals

of the groups. It also helps to explain that individual women agri-preneurs who participate in groups have different personal interests that affect achievement of group's main goal. This theory also explains that women agri-preneurs who participate in one group for instance, give different efforts towards the success of the group as others may depend on others' efforts. This theory was not the best for this study since the main output is not social capital.

Theory of Utility Maximization

The theory of Utility Maximization by Jeremy Bentham and John Stuart Mill was incorporated into economics by Alfred Marshall who was an English economist. This theory suggests that the cost incurred in acquiring a given product is an approximation of the maximum utility obtained from the given product. In this theory, individuals aim at attaining the highest level of satisfaction from the decisions they make. Utility function shows a point where an individual's fulfilment is met. Marshall explains that utility decreases with an increase in the consumption of a good or service. To maximize utility, a combination of goods and services has to be determined by making a comparison of the marginal utility of two choices available and finding the alternative with highest total utility within the costs incurred.

The decision made is influenced by the choice that gives higher level of satisfaction. For instance, individual women agri-preneurs may decide to participate in groups or not depending on which decision produces the highest marginal utility with less costs incurred. For example, if participation in groups comes with twice more marginal utility than group non-participation, then, participation in groups provides higher marginal utility than non-participation. As a result, female agri-preneurs may decide to participate more in groups. The utility maximizing rule is expressed as follows:

MU of participation in groups/cost of participation in groups= MU of non-participation in groups/cost of non-participation in groups…… (1)

The Total Utility Maximization (TUM) shows the total amount of satisfaction that an individual gets by obtaining a product at a given time. The greater the total utility, the higher the measure of satisfaction gained. Generally, individuals are geared towards getting highest level of satisfaction using the lowest cost. This theory was not effective for this study since the costs of participation and non-participation in groups= may not be determined per dollar.

2.5.2. Conceptual Framework

The conceptual framework for this study was based on Author's conceptualization and analysis. Women agri-preneurs who participate in groups are assumed to be influenced by two independent variables. These variables are demographic factors and socio-cultural factors. Demographic factors include; age, education level, income, household size and employment status of the female agri-preneur. The socio-cultural factors influencing participation in groups include women's leadership position in the community, time taken in the agribusiness activity, who makes decisions in the agribusiness enterprise, ability to have business partners, group perception and previous experiences in groups. The abovementioned independent variables and the moderating factors, also known as the economic factors, influence the intervening variables, which are the women agri-preneurs' decision to participate in groups. These moderating factors includes the type of business enterprise, size of business enterprise, source of funds, government policy, able to borrow a loan, market access, and technology access . The dependent variable for this study will be an increase in agribusiness diversification in terms of number of agribusiness lines, such as tomato, kales, onions, different types of cereals, fruits, and any other agricultural product line as shown in Figure 1 below:

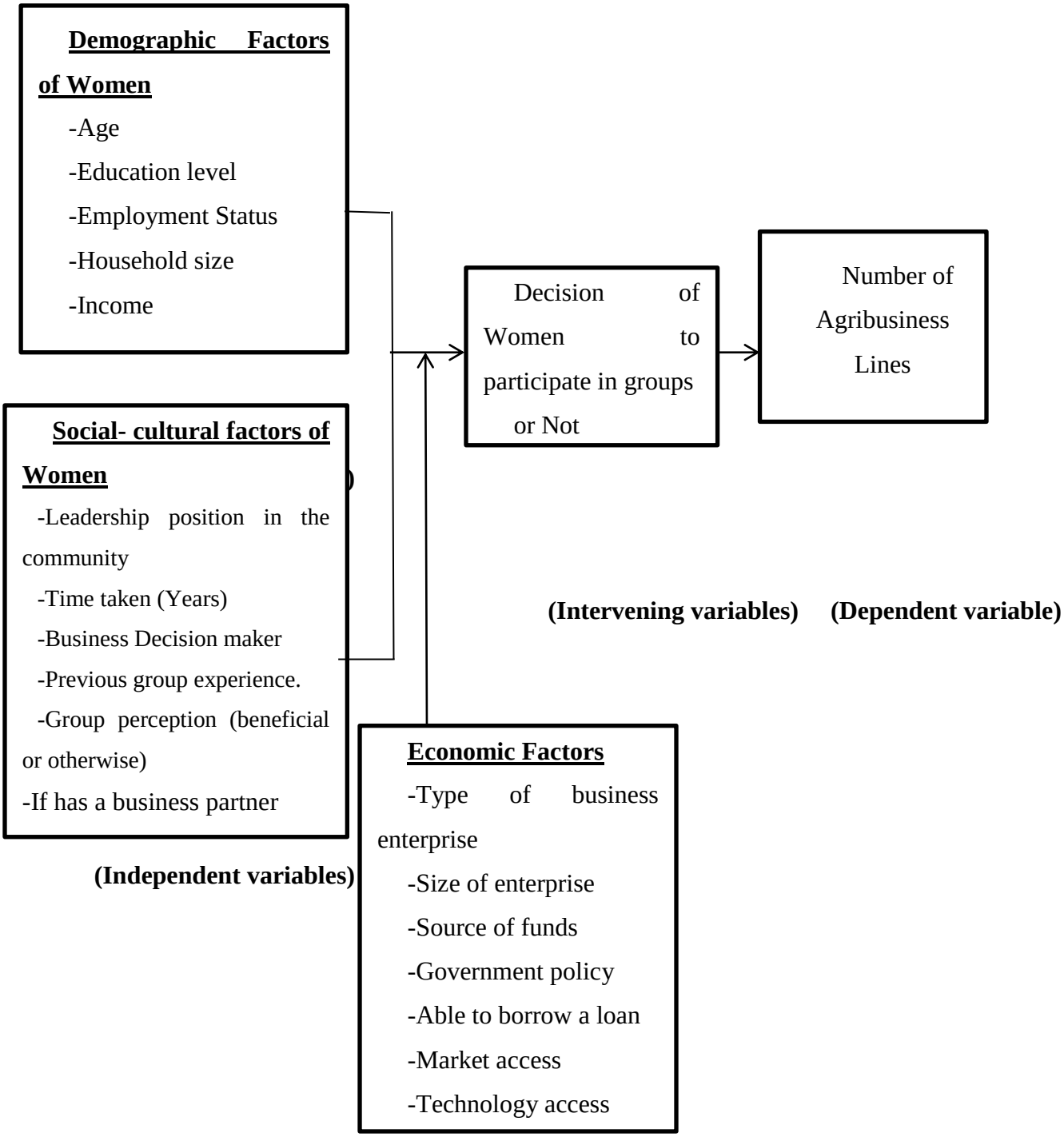

Figure 1. Conceptual Framework of the Study

CHAPTER THREE

METHODOLOGY

3.1. Study Area

The study was carried out in Njoro and Molo Sub-counties of Nakuru County. Nakuru County covers an area of 7496.5 km² with an approximate population size of 2,162,202, according to the Kenya population and housing census (2019).The main agricultural products produced in this county are mainly maize, beans, Irish potatoes, wheat, and horticultural products such as vegetables, flowers, and fruits. Livestock reared includes cattle, sheep, goats, and poultry. Nakuru County receives rainfall throughout the year, with much rain experienced in April, May, and August. There is less rain in January and February received in Nakuru County; rainfall ranges between 22mm and 143mm. Njoro and Molo sub-counties cover approximately 713km² and 478.79km² respectively. Njoro Sub-county lies at 0.3305° S, 35.9434° E while Molo Sub-county lies at 0.2471° S, 35.7374° E. The population size of Njoro sub-county is 208,300, while that of Molo sub-county is 156732 (Census, 2019). The study also focused on two wards in every sub-county. In Njoro, Mau-Narok and Mauche wards were considered, and in Molo sub-county, Elburgon and Molo wards were considered. The study wards have women who predominantly depend on agribusiness activities. There also exist groups in the identified wards. The map of the study area is shown in Figure 2 below:

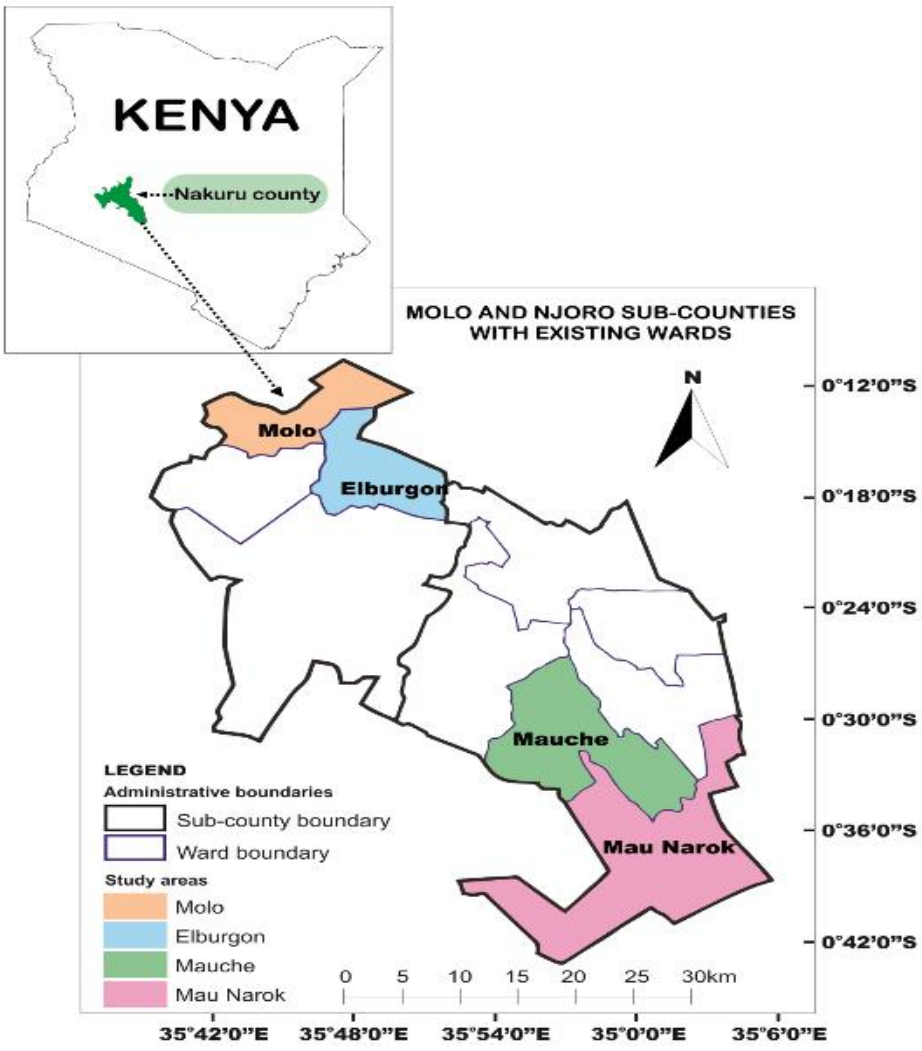

Figure 2. Map of the Study Area (Molo and Njoro Sub-Counties)

Source: Egerton University Geography Department (2024)

3.2. Sampling Design

This study was focused on women who participate in agribusiness activities. Female agri-preneurs participating in groups and non-participants made up the study's target population. Cochran's formula (1977) was applied in obtaining the sample size. This is because it calculates an ideal sample size given a desired level of precision, desired confidence level, and the estimated proportion of the attribute present in the population. Although there were other alternative methods of sample size determination Cochran's for this case was suitable as shown below:

$$n = \frac{Z^2 Pq}{e^2} \quad \text{..... (1)}$$

where; n is the desired sample size from the target population; Z is the normal standard deviation at the required confidence level of 95% (Z=1.96); p is the proportion in the target population assumed to contain the desired characteristics (Female agri-preneurs who participate in either formal or informal groups) (p=0.5); q is the proportion in the target population assumed not to contain the characteristics (Female agri-preneurs who are non-participants of either formal or informal groups), q=(1-p)=0.5; and e is the acceptable margin error (e=0.06).A bigger error has been used for diversify in the women because the women to targeted in this study participate in many types of activities.

$$n = \frac{1.96^2 \ x0.5x0.5}{0.06^2} \quad =267 \text{.....} \quad (2)$$

3.2. Sampling Procedure

The study employed a multistage sampling technique. The first stage involved purposively selecting two sub-counties in Nakuru County. The second stage involved purposively selecting two wards from each sub-county. The third stage involved selecting female agri-preneurs who participate in groups and those who do not participate in groups randomly. The two sub-counties are Njoro and Molo. Mau-Narok and Mauche wards were selected from Njoro, while Molo and Elburgon wards were selected from Molo sub-county. A proportionate random sampling method was conducted to ensure representativeness. To obtain impact estimates generalizable to the target population, comparison units were pooled to have a reasonable number of observations with features corresponding to those of the treated (group participants) units (Heinrich *et al*., 2010). Based on this argument, therefore, a higher sample size for untreated (group non-participants) 60% were used to avoid bias and to optimize estimation of treatment effects as

shown in the table below based on the information given by agricultural officers from both sub-counties on women participating in agribusinesses.

Table 3.1: Proportionate Sample Distribution

Wards	Populations	Treated (40%)	Untreated (60%)	Total
Njoro Sub-County				
Mauche Ward	4999	30	45	75
Mau Narok Ward	5051	30	46	76
Molo Sub-county				
Molo Ward	3900	23	35	58
Elburgon ward	3847	23	35	58
Total	**17797**			**267**

3.3. Data Collection

The study used both primary and secondary data. Secondary data was collected from published journals, government websites, and unpublished documents. The Primary data was collected using semi-structured administered questionnaire (See Appendix 1). A pilot study was conducted to test the validity of the questionnaire by interviewing 25 women agri-preneurs in Keringet ward in Kuresoi- South sub-county in Nakuru County. Well-trained enumerators did the data collection process. Semi-structured questionnaires were used because they gave room for more information for the study. The study also involved many respondents, making this method appropriate. The questionnaire consisted of general information about the female agri-preneurs, such as age, education level, size of the household, employment status, agribusiness experience, decision making, any leadership role, group perception, any past experience about participation in groups, type of the agribusiness enterprise, size of the enterprise in terms of income, number of business lines, source of funds for the enterprise, government's role, credit accessibility, market and technology accessibility.

3.4. Data Analysis

For the purpose of this study, data collected was cleaned, sorted, coded and analyzed using STATA and SPSS soft wares. To achieve objective one, the study used descriptive statistics to characterize female agri-preneurs in Njoro and Molo sub-counties. The binary Logit model was

applied to determine the factors influencing women's participation in groups. To achieve objective three, the standard Poisson regression model was used to examine the effect of women's participation in groups on agribusinesses' involvement in terms of the number of business lines.

3.5. Analytical Framework

3.5.1. Objective i. To characterize women agri-preneurs in Njoro and Molo sub-counties in Nakuru County

Statistical analysis was carried out to analyze this objective. Chi-square inferential statistics was used to compare adaptation practices between women engaged in groups and those not involved in groups but participating in agribusiness activities from different geographical locations in the county.

3.5.2. Objective ii. To determine the factors that influence women participation in groups in Njoro and Molo Sub-Counties in Nakuru County

The binary logit model was used to analyze this objective. The logit model was chosen because it enables handling of both ordinal and nominal independent variables, especially with the assumption that the model has a non-linear relationship to the explanatory variables (Gujarati & Porter, 1995). Moreover, participation in groups is endogenous thus can be affected by self-selection problem. However, the problem of selection bias has no effect on the logit regression model hence fit for this objective. The explained variable was a binary variable stating whether the respondents participate in groups or not. In the study, the decision by female agri-preneurs to participate in groups was modeled as a binary choice with the assumption of utility maximization by female agri-preneurs subject to resource constraints (Manski, 1977). A female agri-preneurs chose to join a group if the utility, *Uc* derived from participation in groups, was higher than the utility derived from non-participation, *Ui*. The utility *Ui* of a female agri-preneurs in this study was expressed as a function of various exogenous variables, *Xi,* and a vector parameter *β.*

$$Ui = Vi\ (\beta Xi) + ui \quad \text{..... (1)}$$

Where: *ui* is the error term. Important to note is that participation in groups decision is affected by external and internal influencing factors.

Depending on the utility, the probability of a female agri-preneurs being a group participant will therefore be given by;

$P(ui < \beta Xi)$ ……...….(2)

This can be expressed in an equation as;

$P(C = 1) = P(ui < \beta Xi) = Vi\ (\beta Xi) + ui$ ..... (3)

Where *P* denotes probability, C = 1 for group participants, and C = 0 for non-participants. According to the previous literature, the internal factors that will be expected to influence female agri-preneurs decisions to participate in groups include demographic factors such as the age of the female agri-preneurs, education level, income, household size, experience, employment status of the female agri-preneurs among other covariates.

The external factors expected in this study will include socio-cultural and economic factors. The socio-cultural factors will include: leadership position of female agri-preneurs in the community, time taken to operate agribusiness activities, who makes decisions in the agribusiness enterprise, ability to have partners by women agri-preneurs, and previous group experiences. The economic factors will include the type of business enterprise, size of business enterprise, government policy, credit access, market access, and technology access on participation.

The general equation of the Logit model will be described as follows:

$q(E(y)) = \alpha + \beta x1 + \gamma x2$.....(4)

Where q is the link function, E(y) is the expectation of the target variable, and $\alpha + \beta x1 + \gamma x2$ is the linear predictor (α, β, γ are the coefficients). This model will provide the probability of success or failure on the outcome of the dependent variable. Hence the sum of the two possible outcomes must be equal to 1 (Sperandei, 2014).

Therefore, by estimating the probability of success as *P*, then the probability of failure becomes *1-P*.

To derive the Logit function, a simple regression equation will be applied;

$q(Y) = \beta o + \beta\ (Xi)$..... (5)

Where; y is the dependent variable and *Xi is* the dependent variable. The probability of success will be established by a general equation as;

$P = \exp(\beta o + \beta(Xi)) = e^{\wedge}(\beta o + \beta(Xi))$ …….....(6)

To satisfy the condition that probability must be equal to or less than one, equation 6 will be divided by a value of more than 1.

$p = \exp(\beta o + \beta(Xi)) / \exp(\beta o + \beta(Xi)) + 1 = e^{\wedge}(\beta o + \beta(Xi)) / e^{\wedge}(\beta o + \beta(Xi)) + 1$.....(7)

Then equation 7 will give probability as

p = e^y/ 1 + e^y..... (8)

Equation 8 will be the Logit function. *P* denotes the probability of success. The probability of failure will be estimated from equation 8 as;

1- p = 1-(e^y/ 1 + e^y)…….…….....(9)

In addition to probability estimates from the logit model, the study will go ahead to estimate the odds ratio of the outcome using logistic regression. The odds ratio is always estimated from the logit model transformation by dividing Equation 8 by Equation 9

Odds ratio = $P/(1-p)$= e^y.....(10)

By introducing log,

Log ($P/(1-p)$)= y.....(11)

The logit model for the estimation of the probability of participation in groups will be generally expressed as;

P(1-0)= $\beta 0+\beta_1 X_1+\ldots\ldots\beta_n X_n+u$…….(12)

U≈N(0,1).

The logit model will be specified as;

P(grpparti) = $\beta 0+\beta_{1age}+\beta_{2educa}+\beta_{3employ}+\beta_{4Hhsize}+\beta_{5holdleadership}+\beta_{6decisionmaking}+\beta_{7agribusinesstime}+\beta_{8bspartner}+\beta_{9experie}+\beta_{10btype}+\beta_{11bssize}+\beta_{12gvtpolicy}+\beta_{13borrowing}+\beta_{14tech}+u$……(13)

The variables used in this model are described in the Table below.

Table 3.2: Variable to be used in Binary Logit Model

Variable name	Description and type	Measurements	Expected effect
	Dependent Variable		
Grpparti	Is a female agri-preneurs a group member?		
	Independent Variable		
Age	Age of the female agri-preneurs (Discrete)	In Years	+/-
Educa	Highest education level of female agri-preneurs (Categorical)	1=No-formal education, 2=Primary	+/-

		level, 3=Secondary level, 4=College/University	
Employ	Employment status of the female agri-preneurs (Dummy)	1 if employed, 0 otherwise	+/-
Hhsize	Household size (Discrete)	Number of household	+/-
Holdleadership	Leadership in the community (Dummy)	1 if yes, 0 otherwise	+/-
Decisionmaking	making decision about the enterprise (Categorical)	1=Female agri-preneurs, 2=Spouse, 3=Both	+/-
Agribusinesstime	Time that a female agri-preneurs has spent in agribusiness activity (Continous)	In years	+/-
Bspartner	Availability of the business partner (Dummy)	1 if yes, 0 otherwise	+/-
Experie	Previous experience on groups (Dummy)	1 if good, 0 otherwise	+/-
Bstype	Type of business enterprise (Categorical)	1=Selling, 2=Value –addition, 3=Distribution	+
Bssize	Size of business enterprise (Dummy)	1=Large if >Ksh.15,000, 0=Small if <Ksh.15,000	+/-
Gvtpolicy	Government policies on groups (Dummy)	1 if Favorable, 0 otherwise	+/-

Borrowaloan	Able to borrow a loan (Dummy)	1 if yes, 0 otherwise	+/-
Tech	Technology use and access (Dummy)	1 if yes, 0 otherwise	+/-

3.5.3. Objective iii. To determine the effects of women participation in groups on involvement in agribusinesses in Nakuru county

The dependent variable for this objective will be agribusiness diversification in terms of number of agribusiness lines that a female agri-preneurs participates in. Because number of agribusiness lines is count data, this objective will be analyzed using the standard Poisson regression model (Greene, 2002; Gujarati & Porter, 2004).

The standard Poisson regression model is shown below in equation 1;

$f(Y_i = y_i|X_i) = \frac{{\mu_i}^{Y_i - \mu}}{Y_i^!}$ $Y_i = 1,2,3 \ldots, \lambda > 1$……………..…………………….....(1)The Y factorial ($Y_i^!$) Means; agribusiness lines that the female agri-preneurs involves in i, Xi is a vector of independent variables and m₂ parameter of Poisson distribution associated with *Xi*.

$Y_i^! = Y \times (Y-1) \times (Y-2) \times 2 \times 1$……………………………………………(2)

The Poisson model is non-linear regression, although the parameters can still be estimated using the maximum likelihood technique. The standard Poisson regression is associated with the disadvantage of assuming the equality between the conditional mean of the data and the variance function (Gujarati & Porter, 2004). The Poisson model also exhibits an "excess zeros" problem caused by non- participation in groups by female agri-preneurs, limiting the use of this model. This limitation will be addressed using the negative binomial regression(NBR) model (Greene, 2002). But also, the NBR model does not work where zero outcomes are different from the positive ones qualitatively. To solve this shortcoming of the NBR model, zero-inflated Poisson (ZIP) model is adopted (Lambert, 1992). Although the ZIP model does not work where the data set has an over-dispersion problem, the observed response variance is greater than the conditional mean (Greene, 2002). Over-dispersion and excess zeros challenges are, therefore, simultaneously addressed by the zero-inflated negative binomial (ZINB) regression model (Minami *et al*., 2007). Variables included in the standard Poisson regression model and their expected influences are

selected from previous studies (Kimambo *et al.,* 2018; Saghaian & Mohammadi, 2018; Wahyudi *et al.,* 2019). The choice of the dependent and independent variables are as shown in the Table 3 below:

Table 3.3: Description of Variables for the Standard Poisson Regression Model

Variables	Description and Type	Measurements	Expected Sign
	Dependent variable		
Agribusiness Involvement	Number of Agribusiness product Lines e.g. Kales, tomatoes, onions, milk, fish as product lines etc.		
	Independent variables		
Age	Age of the female agri-preneurs (Continous)	In years	+/-
Educa	Education level of the female agri-preneurs in years (Categorical)	1=No formal education, 2=Primary level, 3= Secondary level, 4=College/University	+/-
Income	Annual income of the female agri-preneurs in Ksh (Dummy)	1 if greater than 15,000 Ksh, 0 if less than Ksh.15,000	+/-
Employ	Employment status of the female agri-preneurs (Dummy)	1=Yes,0=No	+/-
Hhsize	Household size (Continous)	Number of People in households	+/-
Decisionmaking			
Holdleadership	Who makes decision in the enterprise	1=Female agri-	+/-

Agribusinesstime	(Categorical) Leadership position that a female agri-preneurs has in the community (Dummy) Time taken by female agri-preneurs in operating the enterprise (Continous)	preneurs, 2=Spouse, 3=Both 1=Yes,0=No In years	+/- +/-
Percep	Perception on participation in groups (Dummy)	1=Beneficial,0=Non-Beneficial	+/-
BsPartner	Presence of a business partner in the enterprise (Dummy)	1=Yes, 0=No	+/-
Experie	Previous experience on groups (Dummy)	1=Good,0=Bad	+/-
Bstype	The type of the business enterprise	1=Selling 2=Value-addition 3=Distribution)	+
Bssize	Size of the business enterprise in terms of profit per month from all agribusiness lines	1=Large if >Ksh.30,000, 0=Small if <Ksh.30000	+/-
Fundsource	Source of funds for the agribusiness enterprise	1= Capital 2=credit 3=Donations and grants	+/-
Gvntpolicy	Government policies on the groups participation	1=Favourable, 0=Unfavourable	+/-
Borrowloan	Able to borrow a loan	1=Yes, 0=No	+/-
Mrkt	Market access	1=Yes, 0=No	+/-

Tech	Technology access	1=Yes,0=No	+/-

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter provides the discussion of results for the three specific objectives. Sub-section one presents the results for the first objective whereby the characteristics of individual female agri-preneurs identified in the field were analyzed in terms of age, education level, agribusiness enterprise size, household size, employment status, decision making in the agribusiness enterprise, leadership position of female agri-preneurs in the community, type of business that the female agri-preneurs participates in and source of funds for the agribusiness enterprise grouped in descriptive statistics. In sub-section two, the second objective was addressed whereby the factors that influence women's participation in groups were analyzed in a binary logit model. Finally, in the last sub-section, the effect of women's participation in groups on involvement in agribusinesses was determined using standard Poisson regression model.

4.1. Characteristics of Women Agri-preneurs in Njoro and Molo Sub-counties in Nakuru County

The characteristics of female agri-preneurs discussed below includes: age, education level, agribusiness enterprise size, household size, employment status, decision making in the agribusiness enterprise, leadership position of female agri-preneurs in the community, type of business that the female agri-preneurs participates in and source of funds for the agribusiness enterprise.

Table 4.1: T-Tests Group Participation Statistics

Variable	Are you Participating in a Group?	N	Mean	Standard Deviation	Standard Error Mean
Age of the Female Agri-preneurs	No	167	39.72	12.998	1.006
	Yes	111	42.19	11.204	1.063
Education level of female agri-preneurs	No	167	2.48	.693	.054
	Yes	111	2.50	.672	.064

Size of the house hold	No	167	4.41	2.080	.161
	Yes	111	4.95	2.203	.209
Employment status of Female Agri prenuer	No	167	1.96	.187	.014
	Yes	111	1.98	.134	.013
Who makes decisions about agribusiness	No	167	1.29	.714	.055
	Yes	111	1.27	.687	.065
Hold leadership position	No	166	.08	.269	.021
	Yes	111	.21	.407	.039
	Yes	111	.95	.208	.020
Selling	No	167	.99	.077	.006
	Yes	111	.99	.095	.009
Value addition	No	167	.10	.303	.023
	Yes	111	.05	.227	.022
Distribution	No	167	.08	.278	.022
	Yes	111	.20	.400	.038
Savings as a source of fund	No	167	.93	.259	.020
	Yes	111	.88	.323	.031
Credit as a source of fund	No	164	.05	.216	.017
	Yes	111	.21	.407	.039
Donations and Grants as a source of fund	No	164	.02	.155	.012

Yes	111	.07	.260	.025

Table 5.2: Independent Sample test

		Independent Samples T			
		Levene's Test for Equality of Variances			
		F	Sig.	t	df
Age of the Female Agri-preneurs	Equal variances assumed	2.843	.093	-1.638	
	Equal variances not assumed			-1.688	258
Education level of female agri-preneurs	Equal variances assumed	.108	.743	-.196	
	Equal variances not assumed			-.197	240
Size of the house hold	Equal variances assumed	.344	.558	-2.066	
	Equal variances not assumed			-2.042	226
Who makes decisions about agribusiness	Equal variances assumed	.424	.515	.269	
	Equal variances not assumed			.271	242
Hold leadership position	Equal variances assumed	42.001	.000**	-3.171	
	Equal variances not assumed			-2.933	173
Selling	Equal variances assumed	.338	.561	.291	
	Equal variances not assumed			.279	202
Value addition	Equal variances assumed	8.420	.004	1.415	
	Equal variances not assumed			1.498	272

Distribution	Equal variances assumed	32.413	.000**	-2.811	
	Equal variances not assumed			-2.619	179
Savings as a source of fund	Equal variances assumed	6.659	.010**	1.291	
	Equal variances not assumed			1.236	199
Credit as a source of fund	Equal variances assumed	80.668	.000**	-4.189	
	Equal variances not assumed			-3.757	152
Donations and Grants as a source of fund	Equal variances assumed	14.960	.000**	-1.905	
	Equal variances not assumed			-1.737	162
The size of agribusiness enterprise in terms of income per month	Equal variances assumed	92.545	.000**	-16.205	
	Equal variances not assumed			-18.136	265
Employment status of Female Agri-prenuer	Equal variances assumed	3.104	.079	-.873	
	Equal variances not assumed			-.932	274

***, **, * =level of significance at 1%, 5% and 10% respectively.

4.1.1. Age of the Female Agri-preneurs

On average, participants in a group are slightly older (42.19 years) than non-participants (39.72 years) (as shown in table 4.3), but this difference is not statistically significant based on the t-test.

Table 6.3:: Descriptive Statistics for Age in Years

Ward	**Range**	**Range Minimum**	**Maximum**	**Mean**	**Standard Error**	**Standard Deviation**	**Variance**
Molo	62	20	70	43.90	1.659	14.177	200.977
Elburgon	50	20	70	43.21	1.385	10.991	120.812
Mau-Narok	47	20	65	37.36	1.627	12.172	118.161

Mauche	49	21	70	38.34	1.164	10.792	116.461
Overall Result	62	20	70	40.71	0.741	12.354	152.563

Age distribution of respondents is shown below. A majority of respondents, both female group participants and non-participants lie between 20 years and 70 years. The overall mean age of the female agri-preneurs in Njoro and Molo Sub-Counties is 40 years with a standard error of 0.74. As per the Global Entrepreneurship Monitor (GEM) 2019/2020 report on the age of entrepreneurs, the age between 20 years to 34 years always has the highest population for almost every geographical area. Majority of the young people are vibrant to make positive changes in their world through entrepreneurship (Tasman *et al*., 2023). The respondents' age in the respective wards are as well shown in Table 4.3 below:

4.1.2. Education Level of the Female Agri-preneurs in Years

There's minimal difference in the average education level between participants and non-participants, but this difference is not statistically significant based on the t-test.

Table 7.4: Education level of Female Agri-preneurs (%)

Ward	**No-formal education**	**Primary Level**	**Secondary Level**	**Tertiary/College**	**Total**
Molo	2.7%	49.3%	34.2%	13.7%	100%
Elburgon	4.8%	52.4%	34.9%	7.9%	100%
Mau-Narok	0.0%	57.1%	33.9%	8.9%	100%
Mauche	3.5%	55.8%	38.4%	2.3%	100%
Overall Result	2.9%	53.6%	35.6%	7.9%	100%

Majority of the respondents have attained primary and secondary education, with 53.6% of the female agri-preneurs attaining primary education level and 35.6% attaining secondary level. Also the study shows that 2.9% of the female agri-preneurs in Njoro and Molo sub-counties have no formal education. 7.9% of the respondents have attained tertiary education. Elburgon ward has the highest percentage of female agri-preneurs with no formal education followed by Mauche and Molo wards with 4.8%, 3.5% and 2.7% respectively. Mauche has the lowest percentage of female agri-preneurs who have attained tertiary education level with 2.3% while Molo has the highest percentage of 13.7%. Education gives birth to more intelligent people who

are in position to identify and make use of opportunities. Educated female agri-preneurs also are in position to make better decisions and always take the best option for the success of the enterprise although majority of female agri-preneurs are characterized by low education level (Kimengsi *et al*., 2020).

4.1.3. Size of Agribusiness Enterprise

Participants in a group (0.95) have a larger average size of agribusiness enterprises based on income compared to non-participants (0.23). There is a significant difference in the size of agribusiness enterprises based on income (p-value < 0.05).

Table 8.5: Size of the Agribusiness Enterprise (%)

Ward	<15000, Small	>15000, Large	Total Valid
Molo	43.8%	56.2%	100%
Elburgon	46.0%	54.0%	100%
Mau-Narok	44.6%	55.4%	100%
Mauche	55.8%	44.2%	100%
Overall Result	48.2%	51.8%	100%

Majority of agribusinesses operated by women in Njoro and Molo Sub-Counties give an income of above Ksh.15000 and according to this study this is considered to be large size enterprise.51.8% of agribusinesses in these two sub-counties earn an income of above Ksh: 15000 only with 48.2% earning less than Ksh.15000. Mauche ward has the highest percentage of female agri-preneurs who own and operate small size agribusiness enterprises followed by Elburgon at 55.8% and 46.6% respectively. Molo ward has the highest percentage of agribusiness enterprises that earn more than Ksh. 15000 followed by Mau-Narok 56.2% and 55.4% respectively while Mauche has the lowest percentage of 44.2%. Nakuru County operates in a wide range of agribusiness activities with majority operating small and medium size enterprises (Mwangi, 2020). Large sized agribusinesses are associated with fewer risks, high market power, increased opportunities for economies of scale and it's easier to manage them better (Ritz *et al*., 2019).

4.1.4. Size of the Household

Participants in a group tend to have slightly larger households (4.95) compared to non-participants (4.41). There is a significant difference in household size between the group

participants and non-participants (p-value < 0.05) suggesting that, participants in groups have larger households on average.

Table 9.6: Household Size (Numbers)

Ward	Range	Minimum	Maximum	Mean	Standard Error	Standard Deviation	Variance
Molo	9	1	10	4.05		1.899	3.3608
Elburgon	11	1	12	4.76		2.248	5.055
Mau- Narok	13	1	14	4.89		2.379	5.661
Mauche	10	1	11	4.83		2.042	4.169
Overall Result	13	1	14	4.62	0.128	2.142	4.590

Household description of respondents is as shown in Table 7 below. The minimum number of household is 1 and the maximum number is 14. The general mean of the household is 5 people and the standard error is 0.128. Mau-Narok, Elburgon, Mauche and Molo have the maximum number of households of 14, 12, 11 and 10 respectively. An increase in the size of household increases the amounts of income spend on goods and services for consumption but at a decreasing rate (Simon, 2019).

4.1.5. Employment Status of the Female Agri-preneur

No significant difference is observed in the employment status between the participants in groups and nonparticipants.

Table 10.7: Employment Status (%)

Ward	Employed	Self-employed	Total
Molo	6.8%	93.2%	100%
Elburgon	0%	100%	100%
Mau-Narok	3.6%	96.4%	100%
Mauche	1.2%	98.8%	100%
Overall Result	2.9%	97.1%	100%

Table 4.7 above indicates that 97.1% of the female agri-preneurs who responded are self-employed with only 2.9% being employed. Elburgon ward has 100% self- employment rate, followed by Mauche ward at 98.8% as Molo ward records the least percentage of 93.2% for self-employment. Molo ward has the highest rate of 6.8% for employed female agri-preneurs who

responded followed by Mau-Narok at 3.6%. Self- employment is linked to benefits such as flexibility on the roles played in the enterprise, there is learning on job, independence and the time spent and work done depends on the agri-preneur's decision (Szaban, 2018).

4.1.6. Decision Making about the Enterprise

There's minimal difference between the group participants and non-participants regarding who makes decisions about agribusiness.

Table 11.8: Decision Maker (%)

Ward	Female Agri-preneur	Spouse	Both	Total
Molo	80.8%	1.4%	17.8%	100%
Elburgon	87.3%	0.7%	12.7%	100%
Mau-Narok	80.4%	0%	19.6%	100%
Mauche	89.5%	1.2%	8.1%	100%
Overall Result	85.3%	0.7%	14%	100%

Most decisions made in agribusiness enterprises in Njoro and Molo sub-counties are made by female agri-preneurs at 85.3%. Only 0.7% spouses participate in decision making on agribusiness enterprises. 14% of the respondents agree together with their spouses about their agri-business enterprise. The decision maker needs to make choices on development goals, innovation plans, and strategies on policies as well as all the related agribusiness activities. The decision maker should be flexible, accountable, should be confident, should have clarity of thought, strategic and has analytical skills (Black, 2023).

4.1.7. Leadership of Women Agri-preneurs

Participants in a group are more likely to hold leadership positions (0.21) compared to non-participants (0.08). There is a significant difference in holding leadership positions (p-value < 0.05), suggesting one group has more individuals in leadership roles.

Table 12.9: Leadership of Female Agri-preneurs (%)

Ward	Leaders	Non-leaders	Total
Molo	11%	89%	100%
Elburgon	19%	81%	100%

Mau-Narok	10.7%	89.3%	100%
Mauche	11.8%	88.2%	100%
Overall Result	13%	87%	100%

87% of women respondents who participate in agribusiness activities in Njoro and Molo sub-counties are not leaders in their communities. Only 13% of female agri-preneurs respondents are serving as leaders in their community. Some of the positions are village elders, group leaders and religious leaders. Elburgon has the highest percentage of women leaders with Mau-Narok having the least percentage of 19% and 10.7% respectively. Women are powerful change agents and should participate indecision making and bringing diversity and gender parity in leadership. However, women are faced with similar challenges when it comes to leadership in their communities. Very few women are leaders compared to the respective number of male leaders (Gillard *et al*., 2022).

4.1.8. Source of Funds for the Enterprise

Savings as a source of fund, shows that 0.93 (or 93%) of non-participants (No) rely on savings, with a standard deviation of 0.26. This means that the proportion of non-participants relying on savings varies from 0.67 to 1.19. Similarly, 0.88 (or 88%) of participants (Yes) rely on savings, with a standard deviation of 0.32. There is a higher proportion of non-participants (0.93) than participants (0.88) who rely on savings as a source of funding. However, the difference is relatively small. A similar pattern for credit, as a source of funding. A much smaller proportion of participants (0.21) rely on credit compared to non-participants (0.05). Donations and grants are the least common source of funding for both participants and non-participants.

A higher proportion of non-participants rely on savings as a primary funding source compared to participants. However, the difference is not statistically significant (p-value > 0.05). A significantly higher proportion of participants use credit as a funding source compared to non-participants (p-value < 0.05). There's a slight difference in the proportion of participants and non-participants using donations and grants, with participants having a slightly higher proportion. However, this difference is not statistically significant (p-value > 0.05).

Table 13.10: Source of funds for starting the enterprise (%)

Ward	**Savings**		**Credit**		**Donation**	
	With	Without	With	Without	With	Without

Molo	89.0%	11.0%	14.3%	85.7%	8.6%	91.4%
Elburgon	87.3%	12.7%	15.9%	84.1%	3.2%	96.8%
Mau-Narok	91.1%	8.9%	8.9%	91.1%	1.8%	98.2%
Mauche	95.3%	4.7%	7.0%	93.0%	3.5%	96.5%
Overall Result	91%	9.0%	11.2%	88.8%	4.4%	95.6%

91% of the respondents indicated that the source of funds for their agribusiness enterprises is savings. Only 9% of the respondents did not start their enterprises on savings. 11.2% of the respondents started their agribusiness activities on credit. Elburgon ward has the highest number of agribusiness enterprises that were started from credit funds with respect to Mauche having the least percentage of 7.0% on credit funds. 4.4% of the respondents indicated that the source of business funds was through donation with Molo ward having the highest percentage of donation as the source of funds for agribusiness activities. Mau-Narok has the least percentage of 1.8% in donation from grants, families and friends for agribusiness enterprises. The different sources of funds for agribusiness enterprises are appropriate depending on the purpose of the funds, amount of funds needed, size of the business, flexibility and external factors (Gasanov *et al*., 2019).

4.1.9. Type of Agribusiness Enterprise

Participants in a group (0.20) seem to be more involved in distribution activities compared to non-participants (0.08). There is a significant difference in distribution (p-value < 0.05). No significant difference is observed in selling and value addition between the group participants and non- participants.

Table 14.11: Type of the Agribusiness Enterprise (%)

Ward	**Selling**		**Value Addition**		**Distribution**	
	Yes	No	Yes	No	Yes	No
Molo	100.0%	0.0%	12.3%	87.7%	11.0%	89.0%
Elburgon	100.0%	0.0%	6.3%	93.7%	7.9%	92.1%
Mau-Narok	98.2%	1.8%	8.9%	91.1%	21.4%	78.6%
Mauche	98.8%	1.2%	5.8%	94.2%	12.8%	87.2%
Overall Result	99.3%	0.7%	8.3%	91.7%	12.9%	87.1%

99.3% of the respondents participate in selling of agricultural products in Njoro and Molo sub-counties. All the respondents from Molo and Elburgon wards get involved in selling activities 100%. 8.3% of the respondents take part in value addition with Molo ward having the highest percentage of female agri-preneurs adding value to agricultural products. The percentage of female agri-preneurs involved in value addition in Mauche ward is least compared to all the other wards. 12.9% of the respondents take part in distribution of agricultural produce as a type of business. Mau-Narok ward has the highest percentage of female agri-preneurs participating in distribution of agricultural products with 21.4%. Elburgon has the least percentage of 7.9% female agri-preneurs participating in distribution. The global competitiveness of agribusiness brings in the concept of the sectorial participation through functional integration. The global market has players in all sectors including selling, value addition and distribution of agricultural products (Dzwigol *et al*., 2020).

4.2. To Determine the Factors that Influence Women Participation in Groups in Njoro and Molo Sub-Counties in Nakuru County

As shown in Table13 below for the Omnibus Tests of Model Coefficients under sig. column in the Model raw, the *p*-value that is interpreted is .000. And because the *p*-value for this case is less than .05, then this model is significant and should be further interpreted. It is observed that the relationship between participation in groups and the factors influencing participation was statistically significant at a 5% level of significance ($\chi 2$=268.519, df\=16, p<0.05).

Table 15.12: Omnibus Test of Model Coefficients for Factors Influencing Participation in Groups

		Chi-square	**Df**	**Sig.**
Step1	Step	268.519**	16	.000
Block		268.519**	16	.000
Model		268.519**	16	**.000**

***, **, * =level of significance at 1%, 5% and 10% respectively.

This signifies that a relationship existed between participation in groups and the factors influencing participation in groups. Hence the null hypothesis that states that there is no association between the term and the response is rejected. Based on previous studies, this

inference is consistent with their findings (Bwiru, 2020; Kumar *et al*., 2021; Moreka, 2019). Besides, between 62.1% (Cox & Snell R Square) and 83.9% (Negelkerke R Square) of the variance in participation in groups is explained by the factors influencing participation in groups (Table 4.13).

Table 16.13: Factors Influencing Participation in Groups Model Summary

Step	**-2Log likelihood**	**Cox &Snell R Square**	**Negelkerker R Square**
1	104.491[a]	.621	.839

Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

In addition, a percentage accuracy classification (PAC) of 93.5% was yielded by the factors influencing participation in groups (Table 4.14).

Table 17.14: Percentage Accuracy Classification Table for Factors Influencing Participation in Groups

Observed		**Are you participating in groups**		
	No		**Yes**	**Percentage correct**
Step 1 Are you participating in groups	No	157	9	94.6
	Yes	9	102	91.9
Overall percentage				**93.5**

The cut value is .500

This implies that the explanatory variables in the model accurately predict participation in groups for the female agri-preneurs by 93.5%. Inferring that 93.5% of the times we predict female agri-preneurs to participate in groups is correct. The results of the model showed further that the relationship between the explanatory variables and participation in groups amongst female agri-preneurs differs considerably (Table 4.15).To determine whether the association between the response and each term in the model is a statistically significant, the *p*-value for the term is compared to the significance level to assess the null hypothesis that states that there is no association between the term and the response.

Table 18.15: Factors Influencing Participation in Groups Variables in the Binary Logistic Regression Equation

variables in the equation	B	S.E.	Wald	Df	Sig.	Exp(B)
Age of the female agri-preneurs	0.014	0.029	0.245	1	0.621	1.014
Education level of female agri-preneurs	-0.673	0.463	2.114	1	0.146	0.510
Size of the house hold	-0.032	0.129	0.062	1	0.803	0.968
Employment status of Female agri-preneur	-2.422	1.409	2.955	1	0.086	0.089
Time in agribusiness activity	-0.025	0.040	0.383	1	0.536	0.975
Who makes decisions about agribusiness	0.093	0.416	0.050	1	0.823	1.098
Hold leadership position	-1.419	0.875	2.627	1	0.105	0.242
Do you have any business partner	-1.411	1.116	1.599	1	0.206	0.244
Experience about group membership	-3.666**	0.701	27.323	1	0.000	0.026
Selling	0.865	6.099	0.020	1	0.887	2.374
Value addition	2.110	0.921	5.245	1	0.022	8.250
Distribution	-1.076	0.927	1.349	1	0.246	0.341
The size of agribusiness enterprise in terms of income per month(1)	-3.615**	0.742	23.752	1	0.000	0.027
Government support to participation in groups	-0.475	0.985	0.233	1	0.630	0.622
Able to borrow a loan	-1.886**	0.604	9.755	1	0.002	0.152
Are you able to use and access technology	-1.326	0.839	2.498	1	0.114	0.265
Constant	7.191	3.225	4.972	1	0.026	1328.057

***, **, * =level of significance at 1%, 5% and 10% respectively.

a. Variable(s) entered on step 1:age of the female agri-preneurs, education level of female agri-preneurs, size of the household, employment status of the female agri-preneurs, time in agribusiness activity, who makes decisions about agribusiness activity, hold leadership position, presence of business partner, experience about

participation in groups, type of business enterprise, type of the agribusiness enterprise in terms of income per month, government support, ability to access loans, market availability, technology use and access.

Table 4.15 shows that within the hypothesized 14 explanatory variables, included in the model, three were found to have a significant relationship with participation in groups. These were: size of agribusiness enterprise, experience about group membership and ability to borrow a loan; however, the descriptions for the relationship exhibited by all variables are stated below. Odds ratio of less than one means a negative relationship.

4.2.1 Size of agribusiness enterprise

There is a positive relationship between the size of agribusiness enterprise and women participation in groups. This is statistically significant at 5% level of significance (Wald $\chi 2$=23.752, df=1, p<0.05). Results indicate that female agri-preneurs with large enterprises had 0.027 more chances of participating in groups than those with small sized agribusiness enterprises. Some members view groups to be demanding more time and resources especially a case of merry-go round and Chama in Kenya. Groups also create market avenues and credit access opportunities for members hence helping in business growth and sustainability. Through collective action costs can be spread, volume in the market increases and better prices for products can be negotiated which helps businesses to grow and make more profits (Lee *et al*., 2018)

4.2.2 Previous group experience

There is a positive relationship between group experience and participation in groups. This is statistically significant at 5% level of significance ((Wald $\chi 2$=27.323, df=1, p<0.05). Results indicate that female agri-preneurs with good previous experience about participation in groups have more chances of participating in groups by 0.026 times than those female agri-preneurs with a bad previous experience about participation in groups. Groups are linked to be beneficial therefore those who benefits and grow their agribusinesses from groups have high chances of always participating in those groups so as to continue benefiting from such groups. People have a habit of letting their past experiences dictate their future actions and affect their decisions. Participation in groups are associated with decision making taking quite a long time which may

not be favourable to some participants; there is also conflict in understanding roles and responsibilities within the group (Barinaga, 2022).

4.2.3 Able to borrow a loan

There is a positive relationship between ability to borrow loans and women participation in groups. This is statistically significant at 5% level of significance ((Wald $\chi 2=9.755$, df=1, $p<0.05$). Results indicate that female agri-preneurs who can access loans in groups had 0.152 more chances of participating in groups than those who are not able to borrow loans in groups. This could be because loans enable female agri-preneurs to meet costs related to their agribusinesses. This is consistent to the study that was done on influence of participation in self - help groups that results showed that women participation in groups had appositive influence on loan access (Maina, 2020). The results established in this study are also consistent with those of Orso and Fabrizi (2016) that indicated that women who participate in groups are likely to be members of these groups for a long time because of the benefits derived from them and loan obligations.

4.2.4 Age

The findings show that an insignificant relationship exists between age and participation in groups. It is also observed that female agri-preneurs who are older have 1.014 times reduced chances of participating group than the younger female agri-preneurs. Young female agri-preneurs are innovators, team players, risk takers and problem solvers. The higher the age the more risk averse an entrepreneur becomes. Older agri-preneurs fear to take any risk especially since groups are associated with dishonesty and resources embezzlement (Sapbamrer & Thammachar, 2021). The study also showed that older people have less time to invest for the long term but higher returns are expected.

4.2.5 Education level

Education level of female agri-preneurs negatively relates with participation in groups. Results show that female agri-preneurs with higher level of education have less chances of participating in a group by 0.510 times than female agri-preneurs with low education level. Groups help to open the mind of less educated to knowledge through hands-on training, adoption and use of more modern techniques. This helps to keep entrepreneurs well aware about innovations and sharing of their experiences (Erick *et al*., 2014). However, this result is not

consistent with the study that concluded that education level increases the chances of participating in groups (Nyasula, 2021).

4.2.6 Household size

The size of household has insignificant relationship with participation in groups. It is observed that female agri-preneurs with higher number of household have 0.968 times less chances of participating in groups than female agri-preneurs with smaller number of household. Large household size is related to high current expenses and meeting the group's demands and rules may be difficult. Some groups aim at savings, others at credits and others marketing which may be difficult for high households to meet because larger part of their income is used in current consumption and expenditure in the household (Danso *et al*., 2018).

4.2.7 Employment status

There is a negative relationship between employment status of household and participation in groups. It is indicated that female agri-preneurs who are employed have reduced chances of participating in groups by 0.089 times than those female agri-preneurs who are self -employed. Most female agri-preneurs who are self- employed participate in groups with an aim of saving very small amount of money and at some point in time take up a loan to offset huge financial needs that they have, Thus groups need to promote and undertake lending activities (Maina, 2020).

4.2.8 Time in agribusiness activity

There is insignificant relationship between time in agribusiness and participation in groups. Results show that a female agri-preneurs with a longer period of time in agribusiness activity has reduced chances of participating in groups by 0.975 times than those female agri-preneurs with shorter period of time. As a female agri-preneur spends more time in agribusiness activity, she gets more information on the market, suppliers, and products, the current and potential buyers and on competitors' strategies. More experienced female agri-preneurs in agribusiness activities have more strengths and opportunities and know how to handle the dynamic business environments experienced in the market hence they see no need to participate in groups (Doern *et al*., 2019).

4.2.9 Decision making

Decision making has a negative relationship with participation in groups. Female agri-preneurs who manage to make decisions have less chances of participating in groups by 1.098 times than those who make decisions together with their spouses. Female agri-preneurs who are decision makers understand the trends in the agribusiness lines they are involved in. Trends such as financing, marketing, quality and the quantities needed are well understood by the female agri-preneurs because they are the ones who interact with all other players in the market. Making decisions together with spouses slows the process of decision making because they both have to come to an agreement after consultations. Because fewer spouses of female agri-preneurs who are involved in decision making, the decision to participate in groups is more compared to women who make decisions on their own (Black, 2023).

4.2.10 Leadership position

A negative relationship exists between leadership position of female agri-preneurs in the community and participation in groups. Results indicate that female agri-preneurs who have leadership positions in the community are 0.242 times less likely to participate in groups than those female agri-preneurs without leadership position in the community. Leaders in the community act as a sense of security and they participate in groups to instill morale in order to create an environment of cooperation and teamwork. Majority of leaders act as role models and they should participate in group in that non-leaders can trust the objectives of the groups. Most women are also leaders of groups and majority serving as chairpersons, village elders, secretaries, treasurers and group prefects. Group leaders have to be educated on team building and the dynamics of groups (Omotesho *et al*., 2018).

4.2.11 Business Partner

Presence of business partner has insignificant relationship with participation in groups. Female agri-preneurs with business partners have 0.244 times reduced chances of participating in groups than female agri-preneurs without business partners. Despite partnerships having some drawbacks such as slowed decisions making and disputes that may arise from having business partners, there are also benefits associated with partnerships which includes: sharing of profits and losses as well as assets, more capital availability for the business, there is greater capacity for borrowing; more quality decisions are made hence the benefits derived from groups can gotten from partnerships (Kiss, 2020).

4.2.12 Type of business enterprise

The type of agribusiness enterprise has insignificant relationship with participation in groups. Female agri-preneurs who run selling, value addition and distribution enterprises have 2.374, 8.250 and 0.341 respectively times less chances to participate in groups respectively. Majority of female agri-preneurs practice selling as an activity and they need to participate in groups so as to get the collective marketing avenue, the new technologies for value addition and marketing as well (Ondiba *et al*., 2019).

4.2.13 Government Support

There is a negative relationship between government support and participation in groups. Results show that getting government support decreased female agri-preneurs likelihood of participating in groups by 0.622 times compared to not getting government support. Government plays a big role in entrepreneurial interventions. Government support can be through mobilizing and conducting trainings, funding opportunities, policies and marketing on agribusiness enterprises. Despite government supporting groups and enterprises, studies indicate that most enterprises die within 5 years due to dynamic business environment faced, which most entrepreneurs fail to manage (Bosire *et al*., 2020).

4.2.14 Technology use and access

Technology access has a negative relationship with participation in groups. Results indicate that female agri-preneurs who use and access technology have reduced chances of participating in groups by 0.265 times compared to those who cannot use and access technology. According to the study that was done by Chege *et al*. (2020), results showed that use and access to technology enables entrepreneurs to become innovative through creation of new markets, gain competitive advantage and reducing transaction costs hence reduced chances of participation in groups since there are greater interactions with customers and all other stakeholders. Agri-preneurs who can use and access technology are advantaged in improving the utility of their products and services hence increasing profitability of their enterprises (Franco &Mario, 2017).

4.3. To Determine the Effects of Women Participation in Groups on Involvement in Agribusinesses in Nakuru County

This objective was analyzed using Standard Poisson Regression Model because the dependent variable number of agribusiness lines for this case consists of count data in whole numbers or integers. The dependent variables used consisted of continuous, ordinal or nominal scale. The

ordinal and nominal independent variables are broadly classified as categorical variables. The model information Table in the Appendix confirms that the dependent variable is “number of agribusiness lines”, the probability is the “Poisson” and the link function is natural logarithm (“Log”).

Looking into the goodness of fit Table 15 below, at the value/df column of the Pearson Chi-Square row, the value is 1.926 which is then interpreted as that the model does fit the data well hence the results can be interpreted (p>.05). Also the Pearson Chi-Square can be proves the assumption of equidispersion. A value of 1 indicates equidispersion assumption of the Poisson regression but a greater than 1 value (1.926) indicates over-dispersion but the most common violation of this assumption is over-dispersion.

Table 19.16: Goodness of Fit

Goodness of Fit[a]			
	Value	**Df**	**Value/df**
Deviance	489.798	249	1.967
Scaled Deviance	489.798	249	
Pearson Chi-Square	479.647**	249	1.926
Scaled Pearson Chi-Square	479.647	249	
Log Likelihood	-757.324		
Akaike's Information Criterion (AIC)	1564.648		
Finite Sample Corrected AIC (AICC)	1569.89		
Bayesian Information Criterion (BIC)	1654.977		
Consistent AIC (CAIC)	1679.977		

***, **, * =level of significance at 1%, 5% and 10% respectively.

The likelihood ratio Chi-square test indicates that the full model was a significant improvement in fit over a null (no predictors) model (p<.01) as shown in Table 4.17 below

Table 20.17: Omnibus Test

Omnibus Test[a]		
Likelihood Ratio Chi-Square	**Df**	**Sig.**
810.942***	24	**.000**

***, **, * =level of significance at 1%, 5% and 10% respectively

Age of the female agri-preneurs (p=.020), education level (p=.003), leadership position that women agri-preneurs hold in the community (.003), size of the agribusiness enterprise in terms of income (p=.000), time taken by the female agri-preneurs in the agribusiness activity (p=.000) and ability of the female agri-preneurs to access loans (.000) independent variables were statistically significant (p<.05). However, the independent variables such as employment status of the female agri-preneurs (p=.163), decision making in the agribusiness enterprise (p=.197), perception about participation in groups (p=.287), availability of the business partner (p=.399), experience about participation in groups (p=.299), type of agribusiness enterprises (selling p=.549, value addition p=.391, and distribution p=.359), government support (p=.126), source of funds for the agribusiness enterprise (savings p=.296, credit p=.221 and donations and grants p=.635), size of the household (p=.367) and use and access to technology (p=.700) were not statistically significant. The market availability independent variable was not able to be computed hence (.) symbol way displayed as shown in Table 4.18 below.

Table 21.18: Tests of Model Effects

Tests of Model Effects			
Source	**Type III**		
	Wald Chi-Square	**Df**	**Sig.**
(Intercept)	32.749	1	0.000
Education level of female agri-preneurs	13.813**	3	0.003
Employment status of Female Agri-preneur	1.951	1	0.163
Who makes decisions about agribusiness	4.682	3	0.197
Hold leadership position	8.703**	1	0.003
Perception of group perception	1.134	1	0.287
Do you have any business partner	0.712	1	0.399
Experience about group membership	1.079	1	0.299
Selling	0.359	1	0.549
Value addition	0.735	1	0.391
Distribution	0.841	1	0.359
The size of agribusiness enterprise in terms of income per month	131.934**	1	0.000

Savings as a source of fund	1.092	1	0.296
Credit as a source of fund	1.496	1	0.221
Donations and Grants as a source of fund	0.226	1	0.635
Government support to participation in groups	2.339	1	0.126
Able to borrow a loan	27.294**	1	0.000
Is the market for your agribusiness available	.[a]	.	.
Are you able to use and access technology	0.148	1	0.700
Age of the Female Agri-preneurs	5.406**	1	0.020
Size of the house hold	0.815	1	0.367
Time in agribusiness activity	12.233**	1	0.000

***, **, * =level of significance at 1%, 5% and 10% respectively.

The dot (.) means that the value could not be computed. It is often used for statistics of redundant parameters. In this case probably the variable "market availability" is constant, and then the corresponding parameter is redundant, as the intercept is there too.

A Poisson regression was run to predict the number of agribusiness lines that a female agri-preneurs has based on age of the female agri-preneurs, education level of the female agri-preneurs, the female agri-preneurs' household size, employment status of the female agri-preneurs, who makes decisions about the agribusiness enterprise, the leadership position that the female agri-preneurs holds in the community, the perception of the female agri-preneurs towards participation in groups, presence of the business partner in the enterprise, the past experience of the female agri-preneurs on participation in groups, time taken by the female agri-preneurs in operating agribusiness activities, the type of business, size of business in terms of monthly income, the source of funds that a female agri-preneurs used as capital, government support on women participation in groups, ability of the women agri-preneurs to access loans, market and ability to use and access technology.

To determine and explain the interactions of the various independent variables with the dependent variable "number of agribusiness lines, the parameter estimates has to show the coefficient estimate (the "B" column) and the exponentiated values of the coefficients (the "Exp (B)" column) of the standard Poisson regression model. Exp(B) column explains the interpretations 1 being the constant as discussed below and shown in Appendix IV:

4.3.1. Age

There is a positive relationship between age of female agri-preneur and the number of agribusiness lines owned. This is statistically significant at 5% significance level (Wald Chi-square =5.406, df=1, p =<0.05). Results indicate that an increase in age by 1 unit (year), increases the number of agribusiness lines by 0.995 times. This could be attributed to the reasoning that the older the female agri-preneur get, the more experience they gain within the agribusiness sector and the benefits and the risks associated with various agribusiness lines. Similar results were reported by Soomro *et al*. (2019), in developing countries like Kenya there is a positive and statistically significant association between the age of agri-preneurs and the performance of the enterprise. However, this study contradicts the study that states that young agri-preneurs are innovative, easily to adapt changes and risk takers. This can be attributed to the fact that young entrepreneurs impact more on agribusiness enterprise's performance than old entrepreneurs (Alene, 2020).

4.3.2. Education level

There is a positive relationship between education level of female agri-preneur and the number of agribusiness lines owned. This is statistically significant at 5% significance level (Wald Chi-square =13.813, df=1, p =<0.05). Results show that the number of agribusiness lines will be more for a female agri-preneur with a higher education level. The number of agribusiness lines will be 0.700 times less for a female agri-preneurs who has no formal education, 0.805 times less for female agri-preneurs who have studied up to primary level and 0.749 times more for female agri-preneurs whose level of education is secondary level. Education level of female agri-preneurs is relatively related to skills, knowledge, motivation, self-confidence, commitment, problem solving skills and discipline that agri-preneurs have towards owning and running an agribusiness enterprise (Alene, 2020). This study is consistent with the study done by Welsh *et al*. (2017), shows that it is expected that higher education level increases the ability to cope with weaknesses and threats of the enterprise. It also enables agri-preneurs to seize through the strengths and the opportunities .in the business enterprise. According to Saidi *et al*. (2017), higher education level is also associated with better decision making to manage an enterprise to reduce the possibility of business failure. A study by Mozumdar *et al*. (2020) indicated that entrepreneurs with higher education level succeed in running their enterprises than those with formal education.

4.3.3. Leadership position in the community

There is a positive relationship between leadership position of women agri-preneurs in the community and the number of agribusiness lines owned. This is statistically significant at 5% significance level (Wald Chi-square =8.703, df=1, p =<0.05). Results indicate that the number of agribusiness lines will be more for female agri-preneurs who hold leadership positions in the community. The number of agribusiness lines will be 0.847 times less when a female agri-preneurs does not hold any leadership position in the community, a statistically significant result, p=.003. Leadership among female agri-preneurs increases chances of exposure to more information, trainings and opportunities. These trainings may be related to markets, how to manage finances and businesses. Female agri-preneurs also who are leaders, get to access different market entry points and access to various technologies for transforming their products to more useful products. A study that was done by Wossen *et al.* (2015) reported similar findings and stated that holding a leadership position in the community can be used as a measure of social capital because it gives the household formal and informal support and information dissemination.

4.3.4. Size of the agribusiness enterprise

There is a positive relationship between the size of the agribusiness enterprise and the number of agribusiness lines owned. This is statistically significant at 5% significance level (Wald Chi-square =131.934, df=1, p =<0.05). Results show that every female agri-preneur who owns a small agribusiness size, (<Ksh.15000) will have 0.470 times less agribusiness lines than those who own large enterprises (>Ksh.15000). A large agribusiness enterprise involves high capital and various lines of agribusinesses. Large agribusiness enterprises are characterized by high investment, huge profits, requires large markets and there is high use and adoption of new techniques. In most cases, large agribusiness enterprises adopt differentiation marketing strategy (Dewar & Hage, 2018).

4.3.5. Time in agribusiness activity

There is a positive relationship between the time taken by female agri-preneur in running an agribusiness activity and the number of agribusiness lines owned. This is statistically significant at 5% significance level (Wald Chi-square =12.233, df=1, p =<0.05). Results indicate that the number of agribusiness lines will be 1.005 times more for every extra year that a female agri-preneurs takes in operating an agribusiness enterprise, a statistically significant result, p=.000. According to Carranza *et al*. (2018), it was concluded that the longer the time taken in

entrepreneurial experience creates a positive impact on business performance. The experience one gains in running of a business for a longer period of time enables them to get knowledge and skills required to establish and exploit opportunities, assessing market trends and decisions pertaining customers' needs and competitors' moves (Shakeel *et al*., 2020). The study that was done by Alene (2020), concluded that the more the years an entrepreneur takes to operate an enterprise, the more profitability of the enterprises.

4.3.6. Ability to borrow loans

There is a positive relationship between the ability of the female agri-preneur to borrow loans and the number of agribusiness lines owned. This is statistically significant at 5% significance level (Wald Chi-square =27.294, df=1, p =<0.05). Results indicate that the number of agribusiness lines will be 0.708 times less for female agri-preneurs who cannot be able to borrow loans for their agribusiness enterprises, a statistically significant result p=.000. Ability to borrow credits enables female agri-preneurs to access more incentives and resources to grow and meet their day to day agribusiness expenses. Ability to borrow loans also gives room for adoption of more modern technologies among female agri-preneurs (Aryal, 2019). According to the study that was done by Fromell (2012), indicated that friends and family are the most common source of credit for many Kenyans. Most business people relied on ROSCAS Rotating Savings and Credit Association), ASCAS (Accumulating Savings and Credit Association) and other investments groups for loans.

4.3.7. Group perception

There is a negative relationship between group perception and the number of agribusiness lines owned. Results show that for every female agri-preneurs who perceived groups to be non-beneficial 0.906 times less agribusiness lines were owned as compared to female agri-preneurs who perceived groups to be beneficial. Groups have been associated to be beneficial in that through groups, members experience good bargaining power, through collective acquisition of inputs and marketing of products market demands can be met, access to resources such as information and also trainings can be achieved through groups. However, some view groups as non-beneficial in that groups waste time and through participation, resources can be lost through dishonesty and corruption. Some agri-preneurs associate groups to embezzlement of resources. The results of this study is consistent with the study that was done on collective action for tackling "wicked" social problems by Gold *et al*. (2018), which concluded that through groups,

problems facing many individuals but may lack the needed resources, capacity , infrastructure and leadership to meet a shared common goal with a wider public benefit. This is also consistent with the findings of the study that was done by Narasaiah and Davi (2017) which concluded that women participation in groups enabled them to solve problems with much ease as they support one another.

4.3.8. Previous group experience

Previous group experience has a negative relationship with the number of agribusiness lines. Results show that the number of agribusiness lines will be 0.908 times less for every female agri-preneurs with a bad experience on participation in groups, a statistically insignificant result p=.299. Participation in groups gives either good or bad experience to its members. According to the study that was done by Komen *et al*. (2022), majorly transparency among the group participants is key and sensitive because lack of transparency leads to disagreements hence corruption and embezzlement of resources. It also noted that, most groups collapse after a short period of existence especially where trust and accountability are in short supply.

4.3.9. Household size

There is a negative relationship between household size and the number of agribusiness lines. Results indicate that number of agribusiness lines will be 0.991 times less for every extra person in the household, a statistically non-significant result p=.367. High number of household is directly related to high household expenditure which reduces savings that help to venture into more agribusiness lines. The income generated from agribusiness activity by the female agri-preneurs, instead of being used to grow the business, most part of the income is used for current consumption hence reduced investments and savings on agribusiness lines. These results are consistent with the study that was done on consumption behavior of rural and urban regions of Pakistan by Aziz *et al*. (2017) that indicated that high household size increases the amount of income spent on consumption reducing household savings and investments.

4.3.10. Government support

Government policy has a negative relationship with the number of agribusiness lines owned. Results indicate that the number of agribusiness lines will be 0.905 times less for female agri-preneurs if the government will not support participation in groups, a statistically insignificant result p=.126. The government support on groups can be through giving aids, funds, training and

tax relaxation to make women agri-preneurs successful. According to the study done by Salah and Kaplan (2018), it suggested that government support has much greater benefits to women who start and run businesses. According to Alene (2020), it was found that there is a negative relationship between tax, low support from the government and the performance of enterprises owned by women.

4.3.11. Employment status

Employment status of female agri-preneurs has a negative relationship with the number of agribusiness lines owned. Results show that the number of agribusiness lines will be 0.825 times less for every female agri-preneurs who is employed, a statistically non-significant result p=.163. Employed entrepreneurs earn an extra income through salaries and wages and most of the time is spent working than when in agribusiness activities. Female agri-preneurs who are self -employed dedicate their full resources such as time and finances to their agribusiness activity because their income is directly proportional to the efforts dedicated to the enterprise. There is also better customer relationship, market analysis and competitors understanding for self-employed agri-preneurs because most of the time they interact with all the actors in the market as well as gaining experiences on technology with others (Sorgner & Fritsch, 2018).

4.3.12. Type of the agribusiness enterprise

There is a negative relationship between the type of agribusiness enterprise and the number of agribusiness lines owned. Results indicate that the types of agribusiness enterprise were classified into selling, value addition, and distribution of agribusiness products. The number of agribusiness lines will be 0.858 times less for female agri-preneurs who do not sell agricultural products. Female agri-preneurs who do not add value to agricultural products will have 1.078 times greater agribusiness lines and female agri-preneurs who do not operate distribution of agricultural products will have 0.949 times less agribusiness lines. Majority of female agri-preneurs practice selling of agricultural produce either in raw form or in processed form because the market is always available and even in the potential market. Some female agri-preneurs who have the right skills and innovative enough can opt to add value to products through the right technologies. Other female agri-preneurs who do not want to act directly with the product can opt to offer services such as distribution from either the supplier to the trader or from the seller to the final consumer (Hutt & Sper, 2021).

4.3.13. Sources of capital

There is a negative relationship between sources of capital and the number of agribusiness lines owned. Results indicate that the sources of capital that the female agri-preneurs used in this study were classified into: savings, credit and donations and grants from family and friends. The number of agribusiness lines will be 0.907 times for a female agri-preneurs who does not depend on savings, as a source of capital, a statistically insignificant result p=.296. Financial literacy has an effect on the saving behaviour among female agri-preneurs (Soukotta *et al*., 2022). According to the study that was done by Flory (2018), it indicates that a number of strong positive effects have been linked to either formal or informal savings. Savings boost household income among agribusinesses and especially female entrepreneurs in Kenya. Some use these savings to start other micro-businesses hence increasing total assets owned and investments.

The number of agribusiness lines will be 0.921 times less for a female agri-preneurs who does not depend on credit as a source of capital, a statistically insignificant result p=.221. According to the study done by Atiase *et al*. (2018), it indicated that access to affordable credit makes agribusiness enterprise competitive most especially in Africa. Access to credit also influences decisions and financial goals of the business enterprise.

The number of agribusiness lines will be 1.054 times greater for a female agri-preneurs who does not depend on donations and grants as a source of capital. According to the study done by Akbulaev *et al*. (2019), it states that in most cases donations and grants are majorly supportive to social entrepreneurs. Social entrepreneurship means that its social impact on the entrepreneurial activity is more important than the financial effect unlike other businesses especially the targeted businesses in this study. Savings play a great role in entrepreneurship through increase in investments. Agri-preneurs who receive donations and grants from family members and friends are more satisfied than those who invest money from credit sources like banks and other money lenders (Mulwa & Mulwa, 2019).

4.3.14. Presence of a business partner

There is a negative relationship between the presence of a business partner and the number of agribusiness lines owned. Results show that the number of agribusiness lines will be 1.087 times more for every female agri-preneurs without a business partner, a statistically insignificant result 0.399. Despite having more benefits of partnerships, there are also more costs associated with having partnerships in a business. These costs include: potential for differences and conflicts,

slower and more difficult to make decisions, it limits business development and there is also limited access to capital which restrains business growth (Kiss, 2020).

4.3.15. Decision making

Decision making has a negative relationship with the number of agribusiness lines owned. Results indicate that the number of agribusiness lines will be 1.080 times more for every decision made in the agribusiness enterprise with the statistically insignificant result p=0.879. For every decision made by female agri-preneurs about the agribusiness enterprise, 1.030 times more agribusiness lines were owned, a statistically insignificant result p=0.574. For every decision made by the spouse of the female agri-preneurs, 0.231 times less agribusiness lines were owned, a statistically significant result p=0.041. Decisions made by female agri-preneurs are fast and in case of a challenge, the solution can be gotten immediately as compared to where spouses are involved and consultations be made which makes the process of decision making slower and time consuming. Spouses who make decisions for their female partners, results to less agribusiness lines and this can be linked to the fact that the challenges faced by the enterprise are not clearly responded to on time and the female agri-preneurs is not given the space to run the business enterprise efficiently.

4.3.16. Technology use and access

Technology use and access has a negative relationship with the number of agribusiness lines owned. Results show that the number of agribusiness lines will be .981 times less for female agri-preneurs who do not know how to use and cannot access technology in their agribusiness enterprises, a statistically insignificant result p=.700. According to the study done by Grewal et al.(2019), indicated that use and access of new technology have revolutionized almost every aspect for existence of human beings, this does not exclude ways that agri-preneurs market agricultural produce and services to consumers. Innovations such as internet access, mobile devices and applications and use of social media have appositive impact on marketing of products and services. Grewal (2019) also indicated that individual seller and firms which adopt each technology early enough changes the rules of the game by becoming market leaders.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The general objective of this study was to contribute to improved livelihoods of women agri-preneurs through enhanced participation in groups by determining the effect of their participation in groups on involvement in agribusinesses in Njoro and Molo sub-counties in Nakuru County, Kenya. Specifically, the study objectives were; to characterize women agri-preneurs in Njoro and Molo sub-counties in Nakuru County, to determine the factors that influence women participation in groups in Njoro and Molo sub-counties in Nakuru County and to determine the effects of women participation in groups on their involvement in different agribusinesses lines in Njoro and Molo sub-counties in Nakuru County.

Data used in the study was gathered from a sample of 267 Female agri-preneurs in Njoro and Molo Sub-Counties. The study used descriptive statistics to characterize female agri-preneurs, binary logit determined the factors influencing women participation in groups and the Standard Poisson Regression Model determined the effect of women participation in groups on their involvement in different agribusiness lines.

From the analysis of the three specific objectives, three conclusions were made respectively:

i. Majority of the female agri-preneurs who responded have age range between 20years to 70 years. A higher percentage of the female agri-preneurs has also: attained primary level of education, are self-employed, earn an income of more than Ksh. 15,000, participate in decision making about the enterprise and very few women agri-preneurs participate in leadership in the community..
ii. Results also reveal that female agri-preneurs' ability to participate in groups is significantly influenced by the experience about group membership, the size of agribusiness enterprise in terms of income per month and ability of the female agri-preneur to borrow a loan.
iii. The age, education level, Leadership position, size of agribusiness enterprise, time taken in the agribusiness activities and ability of the female agri-preneurs to borrow loans positively influence the number of agribusiness lines that women agri-preneurs have.

5.2 Recommendations

Based on the findings from this study, the government has less support on women groups especial the support benefits a few women and this was linked to most group leaders being

corrupt and the support only benefiting them. The government should come up with better policies on how to ensure that every woman benefits from its support. The government can support women in groups through training, tax relaxation aid funds for because it has a greater benefit to women.

5.3 Areas of Further Research

The study based its findings on cross-sectional data; however future research should consider using time series data to get the impact. Research should also be extended to other sub-counties in the country with the same agro ecological conditions. To get a deeper understanding of how female agri-preneurs get support from family, furthers research should be conducted to get theirs opinions, whether husbands support their spouses in agribusiness enterprises.

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APPENDICES

Appendix A: Questionnaire

My name is Ikonya Judith Engurat, a postgraduate student at Egerton University, main Campus Njoro. In partial fulfilment of the requirements for a Master of Science in Agribusiness Management, I am conducting a research entitled: " **Effects of Participating in Groups on Women's Involvement in Agribusinesses in Njoro and Molo Sub-Counties in Nakuru County, Kenya**" I am kindly requesting your assistance in providing information, by filling in the questionnaire below, as your views are considered important to this study. Kindly note that, your participation is voluntary and that any information given will be treated with the utmost confidentiality and will only be used for the purpose of this study.

This survey intends to interview any woman agri-preneur above 20 years of age and either participates in groups or not.

Questionnaire number……

Date: …… Starting time …….. Finishing time …….

Name of interviewer…….

GEOGRAPHICAL LOCATION

WARD: ……**Ward**

1= Molo

2= Elburgon

3= Mau- Narok

4= Mauche

SECTION A: DEMOGRAPHIC INFORMATION

1. Age of the Female Agri-preneur (Years)……..
2. Education Level of the female Agri-preneurs (Years)…….

    1=No formal education

    2= Primary level

    3= Secondary Level

    4=Collage/Tertiary level

3. What is the size of the HH: ……?
4. What is the employment status of the Female agri-preneurs ……?

    1=Employed

2= Self-employed

5. How long has the respondent been in agribusiness activity in years?.....

6. Who makes the decision concerning the agribusiness enterprise? …….

1=Female agri-preneurs 2=Spouse 3=Both

7. Do you hold any leadership position in this Community? .....

1=Yes [ ] 0=No [ ]

If yes, which one? ……

8. What is your perception of participation in groups……..

1=Beneficial [ ] 0=Non-Beneficial [ ]

9. Do you have any business partner in this enterprise? .....

1=Yes 0=No

10. What was your experience about group membership? .....

1= Good [ ] 0=Bad [ ]

11. What is the type of agribusiness enterprise? .....

1= Selling [1=Yes, 0=No] 2=Value addition [1=Yes, 0=No] 3=Distribution [1=Yes, 0=No]

12. What is the size of the agribusiness enterprise in terms of income per month? ..... (1=>Ksh15000-Large, 0=<Ksh.15000-Small)

13. How many business lines do you operate?.....

14. What is the source of funds for the agribusiness enterprise?.....

1= Capital [1=Yes, 0=No] 2= Credit [1=Yes,0=No] 3=Donations and grants [1=Yes, 0=No]

15. Is the government supporting participation in groups? .....1=Yes [ ] 0=No [ ]

16. Are you able to borrow a loan ? .....1=Yes [ ] 0=No [ ]

17. Is the market for your enterprise available? ..... 1=Yes [ ] 0=No [ ]

18. Are you able to access and use technology? ……1=Yes [ ] 0=No [ ]

SECTION B:PARTICIPATION IN GROUPS

Are you participating in any group? ..... 1=Yes [ ] 0=No [ ]

If No, go to section C; if yes, proceed to the next question.

i) How many women are in that group?.....

ii) Are the rules and regulations of the group favoring women's participation?..... 1=Yes[ ] 0=No[ ]

iii) How long has the group been in operation? ……

iv) Is the group helping members to achieve the following services?

a. Able to borrow loans……1=Yes [ ] 0=No [ ] If yes, how much can you access ……..

b. Market access……..1=Yes [ ] 0=No [ ]

c. Technology access…….1=Yes [ ] 0=No [ ]

vi). Are the following training provided in the group?

a. Customer service skills ……1=Yes [ ], 0=No [ ]

b. Business skills……1=Yes [ ], 0=No [ ]

c. Product value chain skills……1=Yes [ ], 0=No [ ]

vii) Are women agri-preneurs involved in the following ways of empowerment?

a. Are you holding or previously held any leadership position in the group? 1=Yes [ ] 0=No [ ]

If yes, specify the position…….

b. Are you able to access information through the group? ……1=Yes [ ] 0=No [ ]

c. Do you participate in decision-making in the group? ..... 1=Yes [ ] 0=No [ ]

viii) Do you think groups are good and should be supported? ..... 1=Yes [ ] 0=No [ ]

If No, give a reason why……

ix) Do you think you can influence another woman involved in agribusiness to participate in groups..... 1=Yes [ ] 0=No [ ]

SECTION C: GROUP NON-PARTICIPATION

i) Are you aware of the existing groups..... 1=Yes [ ] 0=No [ ].

If yes, why are you not participating in them? ..... 1=Groups are bad [ ] 2=You just don't want to participate [ ] 3= You don't trust people [ ] 4= Groups are for rich people [ ] 5= other [ ]

ii) Do you think you can change your mind and start participating in groups in the future?... 1=Yes[ ] 0=No[ ]

End.

Thank you for being so cooperative!!!

Appendix B: Key Data analysis output for objective one

T- Test

Group Statistics

	Are you partipating in any group	N	Mean	Std. Deviation	Std. Error Mean
Age of the Female Agripreneurs	No	167	39.72	12.998	1.006
	Yes	111	42.19	11.204	1.063
Education level of female agripreneurs	No	167	2.48	.693	.054
	Yes	111	2.50	.672	.064
Size of the house hold	No	167	4.41	2.080	.161
	Yes	111	4.95	2.203	.209
Employment status of Female Agri - prenuer	No	167	1.96	.187	.014
	Yes	111	1.98	.134	.013
Time in agribusiness activity	No	167	8.51	8.862	.686
	Yes	111	10.52	9.017	.856
Who makes decisions about agribusiness	No	167	1.29	.714	.055
	Yes	111	1.27	.687	.065
Hold leadership position	No	166	.08	.269	.021
	Yes	111	.21	.407	.039
Perception of group perception	No	167	.40	.490	.038
	Yes	111	1.00	.000	.000
Do you have any business partner	No	167	.02	.153	.012
	Yes	111	.08	.274	.026
Experience about group membership	No	167	.30	.459	.036
	Yes	111	.95	.208	.020
Selling	No	167	.99	.077	.006
	Yes	111	.99	.095	.009
Value addition	No	167	.10	.303	.023
	Yes	111	.05	.227	.022

Distribution	No	167	.08	.278	.022
	Yes	111	.20	.400	.038
The size of agribusiness enterprise interms of income per month	No	167	.23	.424	.033
	Yes	111	.95	.227	.022

Age

Descriptive Statistics[a]

	N	Range	Minimum	Maximum	Mean	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Molo	73	62	20	70	43.90	1.659
Elburgon	63	50	20	70	43.21	1.385
Mau-Narok	56	47	20	65	37.36	1.627
Mauche	86	49	21	70	38	1.164
Overall Result	278	62	20	70	40.71	.741

Data from all the Wards.

Education level of female agri-preneurs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	2	2.7	2.7	2.7
	Primary School	36	49.3	49.3	52.1
	Secondary School	25	34.2	34.2	86.3
	College/University	10	13.7	13.7	100.0
	Total	73	100.0	100.0	

Molo

Valid	No formal education	3	4.8	4.8	4.8
	Primary School	33	52.4	52.4	57.1
	Secondary School	22	34.9	34.9	92.1
	College/University	5	7.9	7.9	100.0
	Total	63	100.0	100.0	

Elburgon

Valid	Primary School	32	57.1	57.1	57.1
	Secondary School	19	33.9	33.9	91.1
	College/University	5	8.9	8.9	100.0
	Total	56	100.0	100.0	

Mau-Narok

Valid	No formal education	3	3.5	3.5	3.5
	Primary School	48	55.8	55.8	59.3
	Secondary School	33	38.4	38.4	97.7
	College/University	2	2.3	2.3	100.0
	Total	86	100.0	100.0	

Mauche

Valid	No formal education	8	2.9	2.9	2.9
	Primary School	149	53.6	53.6	56.5
	Secondary School	99	35.6	35.6	92.1
	College/University	22	7.9	7.9	100.0
	Total	278	100.0	100.0	

Overall Result

The size of agribusiness enterprise in terms of income per month[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<15000 - Small	32	43.8	43.8	43.8
	>15000 - Large	41	56.2	56.2	100.0
	Total	73	100.0	100.0	

Molo

Valid	<15000 - Small	29	46.0	46.0	46.0
	>15000 - Large	34	54.0	54.0	100.0
	Total	63	100.0	100.0	

Elburgon

Valid	<15000 - Small	25	44.6	44.6	44.6
	>15000 - Large	31	55.4	55.4	100.0
	Total	56	100.0	100.0	

Mau-Narok

Valid	<15000 - Small	48	55.8	55.8	55.8
	>15000 - Large	38	44.2	44.2	100.0
	Total	86	100.0	100.0	

Mauche

Valid	<15000 - Small	134	48.2	48.2	48.2
	>15000 - Large	144	51.8	51.8	100.0
	Total	278	100.0	100.0	

Overall Result

Household size

Descriptive Statistics

Ward	Range	Minimum	Maximum	Mean	Standard Error	Standard Deviation	Variance
Molo	9	1	10	4.05		1.899	3.3608
Elburgon	11	1	12	4.76		2.248	5.055
Mau- Narok	13	1	14	4.89		2.379	5.661
Mauche	10	1	11	4.83		2.042	4.169
Overall Result	13	1	14	4.62	0.128	2.142	4.590

Employment status of Female Agri-preneur

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed	5	6.8	6.8	6.8
	Self Employed	68	93.2	93.2	100.0
	Total	73	100.0	100.0	
Molo					
Valid	Self Employed	63	100.0	100.0	100.0
Elburgon					
Valid	Employed	2	3.6	3.6	3.6
	Self Employed	54	96.4	96.4	100.0
	Total	56	100.0	100.0	
Mau-Narok					
Valid	Employed	1	1.2	1.2	1.2
	Self Employed	85	98.8	98.8	100.0
	Total	86	100.0	100.0	

Mauche

Valid	Employed	8	2.9	2.9	2.9
	Self Employed	270	97.1	97.1	100.0
	Total	278	100.0	100.0	

Overall Result

Who makes decisions about agribusiness[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female agri-preneur	59	80.8	80.8	80.8
	Spouse	1	1.4	1.4	82.2
	Both	13	17.8	17.8	100.0
	Total	73	100.0	100.0	

Molo

Valid	Female agri-preneur	55	87.3	87.3	87.3
	Both	8	12.7	12.7	100.0
	Total	63	100.0	100.0	

Elburgon

Valid	Female agri-preneur	45	80.4	80.4	80.4
	Both	11	19.6	19.6	100.0

	Total	56	100.0	100.0	
Mau-Narok					
Valid	0	1	1.2	1.2	1.2
	Female agri-preneur	77	89.5	89.5	90.7
	Spouse	1	1.2	1.2	91.9
	Both	7	8.1	8.1	100.0
	Total	86	100.0	100.0	
Mauche					
Valid	0	1	.4	.4	.4
	Female Agriprenuer	236	84.9	84.9	85.3
	Spouse	2	.7	.7	86.0
	Both	39	14.0	14.0	100.0
	Total	278	100.0	100.0	
Overall					

Hold leadership position[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	65	89.0	89.0	89.0
	Yes	8	11.0	11.0	100.0
	Total	73	100.0	100.0	
Molo					
Valid	No	51	81.0	81.0	81.0
	Yes	12	19.0	19.0	100.0
	Total	63	100.0	100.0	
Elburgon					
Valid	No	50	89.3	89.3	89.3
	Yes	6	10.7	10.7	100.0

	Total	56	100.0	100.0	

Mau-Narok

Valid	No	75	87.2	88.2	88.2
	Yes	10	11.6	11.8	100.0
	Total	85	98.8	100.0	
Missing	System	1	1.2		
Total		86	100.0		

Mauche

Valid	No	241	86.7	87.0	87.0
	Yes	36	12.9	13.0	100.0
	Total	277	99.6	100.0	
Missing	System	1	.4		
Total		278	100.0		

Overall

Type of the business enterprise

Selling[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	73	100.0	100.0	100.0

Value addition

Valid	No	64	87.7	87.7	87.7
	Yes	9	12.3	12.3	100.0
	Total	73	100.0	100.0	

Distribution[a]

Valid	No	65	89.0	89.0	89.0
	Yes	8	11.0	11.0	100.0
	Total	73	100.0	100.0	

Molo

Selling[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	63	100.0	100.0	100.0

Value addition

Valid	No	59	93.7	93.7	93.7
	Yes	4	6.3	6.3	100.0
	Total	63	100.0	100.0	

Distribution

Valid	No	58	92.1	92.1	92.1
	Yes	5	7.9	7.9	100.0
	Total	63	100.0	100.0	

Elburgon

Selling[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	1.8	1.8	1.8
	Yes	55	98.2	98.2	100.0
	Total	56	100.0	100.0	

Value addition

Valid	No	51	91.1	91.1	91.1
	Yes	5	8.9	8.9	100.0
	Total	56	100.0	100.0	

Distribution

Valid	No	44	78.6	78.6	78.6
	Yes	12	21.4	21.4	100.0
	Total	56	100.0	100.0	

Mau-Narok

Selling[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	1.2	1.2	1.2
	Yes	85	98.8	98.8	100.0
	Total	86	100.0	100.0	

Value Addition

Valid	No	81	94.2	94.2	94.2
	Yes	5	5.8	5.8	100.0
	Total	86	100.0	100.0	

Distribution

Valid	No	75	87.2	87.2	87.2
	Yes	11	12.8	12.8	100.0
	Total	86	100.0	100.0	

Mauche

Selling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	2	.7	.7	.7
	Yes	276	99.3	99.3	100.0
	Total	278	100.0	100.0	

Value addition

Valid	No	255	91.7	91.7	91.7
	Yes	23	8.3	8.3	100.0
	Total	278	100.0	100.0	

Distribution

Valid	No	242	87.1	87.1	87.1
	Yes	36	12.9	12.9	100.0
	Total	278	100.0	100.0	

Overall Result

Sources of Funds for Agribusiness Enterprises

Savings as a source of fund

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	25	9.0	9.0	9.0
	Yes	253	91.0	91.0	100.0
	Total	278	100.0	100.0	

Credit as a source of funds

Valid	No	244	87.8	88.7	88.7
	Yes	31	11.2	11.3	100.0
	Total	275	98.9	100.0	
Missing	System	3	1.1		
Total		278	100.0		

Donations and Grants as a source of fund

Valid	No	263	94.6	95.6	95.6
	Yes	12	4.3	4.4	100.0
	Total	275	98.9	100.0	
Missing	System	3	1.1		
Total		278	100.0		

Overall Result

Savings as a source of fund[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	8	11.0	11.0	11.0
	Yes	65	89.0	89.0	100.0
	Total	73	100.0	100.0	

Credit as a source of fund[a]

Valid	No	60	82.2	85.7	85.7
	Yes	10	13.7	14.3	100.0

	Total	70	95.9	100.0	
Missing	System	3	4.1		
Total		73	100.0		

Donations and Grants as a source of fund[a]

Valid	No	64	87.7	91.4	91.4
	Yes	6	8.2	8.6	100.0
	Total	70	95.9	100.0	
Missing	System	3	4.1		
Total		73	100.0		

Molo

Savings as a source of fund[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	8	12.7	12.7	12.7
	Yes	55	87.3	87.3	100.0
	Total	63	100.0	100.0	

Credit as a source of fund[a]

Valid	No	53	84.1	84.1	84.1
	Yes	10	15.9	15.9	100.0
	Total	63	100.0	100.0	

Donations and Grants as a source of fund[a]

Valid	No	61	96.8	96.8	96.8
	Yes	2	3.2	3.2	100.0
	Total	63	100.0	100.0	

Elburgon

Savings as a source of fund[a]

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	No	5	8.9	8.9	8.9
	Yes	51	91.1	91.1	100.0
	Total	56	100.0	100.0	

Credit as a source of fund[a]

Valid	No	51	91.1	91.1	91.1
	Yes	5	8.9	8.9	100.0
	Total	56	100.0	100.0	

Donations and Grants as a source of fund[a]

Valid	No	55	98.2	98.2	98.2
	Yes	1	1.8	1.8	100.0
	Total	56	100.0	100.0	

Mau-Narok

Savings as a source of fund[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	4	4.7	4.7	4.7
	Yes	82	95.3	95.3	100.0
	Total	86	100.0	100.0	

Credit as a source of fund[a]

Valid	No	80	93.0	93.0	93.0
	Yes	6	7.0	7.0	100.0
	Total	86	100.0	100.0	

Donations and Grants as a source of fund[a]

Valid	No	83	96.5	96.5	96.5
	Yes	3	3.5	3.5	100.0
	Total	86	100.0	100.0	

Mauche

Appendix C: Key Data analysis output for objective two

Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	268.519	16	.000
	Block	268.519	16	.000
	Model	268.519	16	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	104.491[a]	.621	.839

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Classification Table[a]

Observed			Predicted		
			Are you participating in any group		Percentage Correct
			No	Yes	
Step 1	Are you participating in any group	No	157	9	94.6
		Yes	9	102	91.9
	Overall Percentage				93.5

a. The cut value is .500

		B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
Step 1[a]	Age of the Female agri-preneurs	.014	.029	.245	1	.621	1.014	.958	1.074
	Education level of female agri-preneurs	-.673	.463	2.114	1	.146	.510	.206	1.264
	Size of the house hold	-.032	.129	.062	1	.803	.968	.752	1.247
	Employment status of female agri-preneur(1)	-2.422	1.409	2.955	1	.086	.089	.006	1.404
	Time in agribusiness activity	-.025	.040	.383	1	.536	.975	.901	1.056
	Who makes decisions about agribusiness	.093	.416	.050	1	.823	1.098	.486	2.481
	Hold leadership position(1)	-1.419	.875	2.627	1	.105	.242	.044	1.346
	Do you have any business partner(1)	-1.411	1.116	1.599	1	.206	.244	.027	2.172
	Experience about group membership(1)	-3.666	.701	27.323	1	.000	.026	.006	.101
	Selling(1)	.865	6.099	.020	1	.887	2.374	.000	369092.426
	Value addition (1)	2.110	.921	5.245	1	.022	8.250	1.356	50.201
	Distribution(1)	-1.076	.927	1.349	1	.246	.341	.055	2.096

	The size of agribusiness enterprise in terms of income per month(1)	-3.615	.742	23.752	1	.000	.027	.006	.115
	Government support to participation in groups(1)	-.475	.985	.233	1	.630	.622	.090	4.285
	Able to access loan(1)	-1.886	.604	9.755	1	.002	.152	.046	.495
	Are you able to use and access technology(1)	-1.326	.839	2.498	1	.114	.265	.051	1.375
	Constant	7.191	3.225	4.972	1	.026	1328.057		

a. Variable(s) entered on step 1: Age of the Female agri-preneurs, Education level of female agri-preneurs, Size of the house hold, Employment status of Female agri-preneur, Time in agribusiness activity, Who makes decisions about agribusiness, Hold leadership position, Do you have any business partner, Experience about group membership, Selling, Value addition , Distribution, The size of agribusiness enterprise in terms of income per month, Government support to participation in groups, Able to borrow loans, Are you able to use and access technology.

Appendix D: Key Data analysis output for objective three

Model Information

Dependent Variable	Number of business lines
Probability Distribution	Poisson
Link Function	Log

Case Processing Summary

	N	Percent
Included	274	98.6%
Excluded	4	1.4%
Total	278	100.0%

Goodness of Fit[a]

	Value	Df	Value/df
Deviance	489.798	249	1.967
Scaled Deviance	489.798	249	
Pearson Chi-Square	479.647	249	1.926
Scaled Pearson Chi-Square	479.647	249	
Log Likelihood[b]	-757.324		
Akaike's Information Criterion (AIC)	1564.648		
Finite Sample Corrected AIC (AICC)	1569.890		
Bayesian Information Criterion (BIC)	1654.977		
Consistent AIC (CAIC)	1679.977		

Omnibus Test[a]

Likelihood Ratio Chi-Square	Df	Sig.
810.942	24	.000

a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III Wald Chi-Square	df	Sig.
(Intercept)	32.749	1	.000
Education level of female agri-preneurs	13.813	3	.003
Employment status of Female agri-preneur	1.951	1	.163
Who makes decisions about agribusiness	4.682	3	.197
Hold leadership position	8.703	1	.003
Perception of group perception	1.134	1	.287
Do you have any business partner	.712	1	.399
Experience about group membership	1.079	1	.299
Selling	.359	1	.549
Value addition	.735	1	.391
Distribution	.841	1	.359

The size of agribusiness enterprise in terms of income per month	131.934	1	.000
Savings as a source of fund	1.092	1	.296
Credit as a source of fund	1.496	1	.221
Donations and Grants as a source of fund	.226	1	.635
Government support to participation in groups	2.339	1	.126
Able to borrow a loan	27.294	1	.000
Is the market for your agribusiness available	.[a]	.	.
Are you able to use and access technology	.148	1	.700
Age of the Female agri-preneurs	5.406	1	.020
Size of the house hold	.815	1	.367
Time in agribusiness activity	12.233	1	.000

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test			Exp(B)	95% Wald Confidence Interval for Exp(B)	
			Lower	Upper	Wald Chi-Square	Df	Sig.		Lower	Upper
(Intercept)	3.193	.2157	2.771	3.616	219.153	1	.000	24.371	15.968	37.195
[Education level of female agri-preneurs=1]	-.356	.1885	-.726	.013	3.571	1	.059	.700	.484	1.013
[Education level of female agri-preneurs=2]	-.216	.0788	-.371	-.062	7.546	1	.006	.805	.690	.940
[Education level of female agri-preneurs=3]	-.292	.0806	-.450	-.134	13.111	1	.000	.747	.638	.875
[Education level of female agri-preneurs=4]	0[a]	.	.	.	.	.	.	1	.	.
[Employment status of Female agri-preneur =1]	-.192	.1376	-.462	.078	1.951	1	.163	.825	.630	1.081

[Employment status of Female agri-preneur=2]	0[a]	.	.	.	.	.	.	1	.	.
[Who makes decisions about agribusiness=0]	.077	.5060	-.915	1.069	.023	1	.879	1.080	.401	2.911
[Who makes decisions about agribusiness=1]	.035	.0616	-.086	.155	.316	1	.574	1.035	.918	1.168
[Who makes decisions about agribusiness=2]	-1.467	.7179	-2.875	-.060	4.177	1	.041	.231	.056	.942
[Who makes decisions about agribusiness=3]	0[a]	.	.	.	.	.	.	1	.	.
[Hold leadership position=0]	-.166	.0562	-.276	-.056	8.703	1	.003	.847	.759	.946
[Hold leadership position=1]	0[a]	.	.	.	.	.	.	1	.	.

[Perception of group perception =0]	-.099	.0928	-.281	.083	1.134	1	.287	.906	.755	1.087
[Perception of group perception =1]	0[a]	.	.	.	.	.	.	1	.	.
[Do you have any business partner=0]	.083	.0983	-.110	.276	.712	1	.399	1.087	.896	1.317
[Do you have any business partner=1]	0[a]	.	.	.	.	.	.	1	.	.
[Experience about group membership=0]	-.097	.0931	-.279	.086	1.079	1	.299	.908	.756	1.090
[Experience about group membership=1]	0[a]	.	.	.	.	.	.	1	.	.
[Selling=0]	-.153	.2557	-.654	.348	.359	1	.549	.858	.520	1.416
[Selling=1]	0[a]	.	.	.	.	.	.	1	.	.
[Value addition =0]	.075	.0873	-.096	.246	.735	1	.391	1.078	.908	1.279
[Value addition =1]	0[a]	.	.	.	.	.	.	1	.	.
[Distribution=0]	-.052	.0568	-.164	.059	.841	1	.359	.949	.849	1.061

[Distribution=1]	0[a]	.	.	.	.	.	.	1	.	.
[The size of agribusiness enterprise in terms of income per month=0]	-.754	.0657	-.883	-.625	131.934	1	.000	.470	.414	.535
[The size of agribusiness enterprise in terms of income per month=1]	0[a]	.	.	.	.	.	.	1	.	.
[Savings as a source of fund=0]	-.097	.0931	-.280	.085	1.092	1	.296	.907	.756	1.089
[Savings as a source of fund=1]	0[a]	.	.	.	.	.	.	1	.	.
[Credit as a source of fund=0]	-.082	.0673	-.214	.050	1.496	1	.221	.921	.807	1.051
[Credit as a source of fund=1]	0[a]	.	.	.	.	.	.	1	.	.
[Donations and Grants as a source of fund=0]	.052	.1103	-.164	.269	.226	1	.635	1.054	.849	1.308

[Donations and Grants as a source of fund=1]	0[a]	.	.	.	.	.	.	1	.	.
[Government support to participation in groups=0]	-.099	.0649	-.227	.028	2.339	1	.126	.905	.797	1.028
[Government support to participation in groups=1]	0[a]	.	.	.	.	.	.	1	.	.
[Able to access loan=0]	-.346	.0662	-.476	-.216	27.294	1	.000	.708	.621	.806
[Able to access loan=1]	0[a]	.	.	.	.	.	.	1	.	.
[Is the market for your agribusiness available=1]	0[a]	.	.	.	.	.	.	1	.	.
[Are you able to use and access technology=0]	-.019	.0506	-.119	.080	.148	1	.700	.981	.888	1.083
[Are you able to use and access technology=1]	0[a]	.	.	.	.	.	.	1	.	.

Age of the Female Agri-preneurs	-.005	.002 4	-.010	-.001	5.406	1	.020	.995	.990	.999
Size of the house hold	-.009	.010 2	-.029	.011	.815	1	.367	.991	.971	1.011
Time in agribusiness activity	.010	.003 0	.005	.016	12.233	1	.000	1.01 0	1.005	1.016
(Scale)	1[b]									

Fixed at displayed values

Appendix E: NACOSTI Research Permit

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NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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Date of Issue: **30/June/2023**

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Appendix F: Published paper on objective two

Engurat, Ikonya Judith and Mutai, Benjamin K. and Owuor, George (2024) *Determinants of Women in Post- Production Agri-value Chain Activities on Group Participation in Njoro and Molo Sub-counties, Nakuru County, Kenya.* Asian Journal of Agricultural Extension, Economics & Sociology, 42 (3). pp. 144-156. ISSN 2320-7027

Official URL: https://doi.org/10.9734/ajaees/2024/v42i32389

Abstract

The Kenyan government has been promoting group participation to enhance agricultural productivity through marketing and financial access to improve livelihoods. Groups have also been valued for their ability to foster social capital and collective actions. However, women's involvement in these groups has not been primarily focused on and taken seriously. Although previous researchers have clearly shown the importance of group participation, the determinants of group participation by women agri-preneurs is still unknown. This article therefore, determined the factors influencing women participation in groups in Njoro and Molo Sub-counties, Nakuru County. A multistage sampling technique was employed. Njoro and Molo Sub-counties in Nakuru County, Kenya between March and August 2023.The study sampled 267 female agri-preneurs, both group participants and non-participants. Data processing was done using STATA and SPSS software. The Binary Logit regression model determined the factors influencing women participation in groups. The major factors influencing women agri-preneurs' participation in groups included: Previous experience about group membership, the size of agribusiness enterprise in terms of income and ability of the female agri-preneur to access and borrow the loan at 95% confidence level. : Previous experience about group membership (P=.000), the size of agribusiness enterprise in terms of income (P=.000) and ability of the female agri-preneur to access and borrow the loan (P=.002) were statistically significant in (P<.05) to their participation in groups. Previous experience about group membership, the size of agribusiness enterprise in terms of income and ability of the female agri-preneur to access and borrow the loan positively influences women participation in groups. This can be attributed to more experience, skills, knowledge and attitude that female agri-preneurs get as they involve more in previous groups and the accessibility of the resources needed to manage their post- production activities.

Appendix G: Published paper on objective three

Abstract

Participating in agribusiness value chains is significant for growth and development of an economy. Women have been noted to have low participation in agribusiness activities as compared to men because women face challenges such as inaccessibility and ownership of assets, social cultural hindrances, lower market innovativeness and versatility factors. To reduce these challenges faced by women agri-preneurs, there is need to adopt agribusiness diversification to ensure the success of agribusiness enterprises. The aim of this study was to determine the factors that influence the number of agribusiness lines that female agri-preneurs participate in. This study was carried out in Njoro and Molo Sub-counties in Nakuru County, Kenya between March and August 2023. A standard Poisson regression model was carried out to examine the number of agribusiness lines that female agri-preneurs have to maximize revenue and spread risks associated with post production agribusiness activities such as selling, distribution and value addition of agricultural products. The study sampled 267 female in agribusinesses, both group participants and non-participants. Data processing was done using SPSS and STATA software. The results showed that age, education level, Leadership position, size of agribusiness enterprise, time taken in the agribusiness activities and ability of the female agri-preneurs to borrow loans positively influence the number of agribusiness lines that women agri-preneurs have.

Published in	*International Journal of Agricultural Economics* (Volume 9, Issue 3)
DOI	10.11648/j.ijae.20240903.12