ASSESSMENT OF AGRICULTURAL SECTOR DEVELOPMENT SUPPORT PROGRAMME FINANCING ON PRODUCTIVITY OF DAIRY FARMERS IN MERU COUNTY

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DECLARATION AND APPROVAL

Declaration by the Student

This research project is my original work, and it has not been presented for any degree in any University or for any other award.

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Approval

I confirm that the work reported in this research project was carried out by the candidate under my supervision.

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DEDICATION

This research project is dedicated to my husband Mr. Patrick, my children, Mitchelle and Adeline and my parents, Mr. and Mrs. Miriti.

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ABSTRACT

Dairy farming is a significant contributor to rural livelihoods and agricultural economies worldwide. Enhancing the capacity of dairy farmers through targeted programmes is essential for improving productivity, profitability, and sustainability. Support programmes tailored for farmers play a critical role in enhancing agricultural productivity, economic stability, and environmental sustainability. One of the main obstacles to the commercialization of the agricultural sector was identified as low productivity, which was typified by low production levels and irregular supply of traded commodities along the value chain. ASDSP financing aimed to address this issue by providing interventions to help value chain actors in the prioritized value chains become more productive It was against this background that this study investigated the impact of Agricultural Sector Development Support Programme (ASDSP) financing on the productivity of dairy farmers in Meru County. The objectives of the study were to investigate the effect of capacity building on dairy farmers' productivity, evaluate the impact of subsidies on dairy farmers' productivity, assess the influence of marketing strategies on dairy farmers' productivity, and evaluate the effect of production resources on dairy farmers' productivity. The study was conducted in Meru County and targeted dairy farmers who benefitted from ASDSP financing. It was anchored in the Production Theory and the Resource Dependency Theory. The study adopted stratified sampling to select farmers' groups, simple random sampling to select dairy farmer representatives, and purposive sampling to select ASDSP financing officers, Dairy Officers, and Livestock Development Officers from each sub-county in Meru County. The sample size comprised 98 respondents selected from a population of 130 individuals. Data was collected through questionnaires and interviews. The quantitative and qualitative data collected were analyzed and presented in tables according to the study objectives. The study employed a mixed-methods design, targeting 98 respondents, with a final response rate of 92.86% (n=91). Key findings indicated that capacity building significantly enhanced dairy management knowledge and practices, with over 80 respondents affirming improvements in feed optimization and hygiene. Subsidies enabled access to high-quality inputs, with over 70% of farmers noting improved milk yields and herd health. Marketing strategies increased price stability and market access, while production resources such as milking machines, storage, and water systems notably improved operational efficiency. Regression results showed that capacity building ($\beta = 0.319$) and production resources ($\beta = 0.295$) were the strongest predictors of productivity. Conclusions affirmed ASDSP's effectiveness, while highlighting challenges in subsidy access, equipment maintenance, and market sustainability. The study recommends enhancing post-training mentorship, streamlining subsidy systems, and sustaining infrastructural investments to ensure long-term productivity and equitable impact among small-scale farmers.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION AND ACRONYMS

ANOVA	**–**	Analysis of Variance
ASDSP	**-**	Agricultural Sector Development Support Programme
CASP	–	Comprehensive Agricultural Support Programme
FAO	–	Food and Agricultural Organization
GDP	–	Gross Domestic Product
IDF	–	International Dairy Federation
IFC	–	International Finance Corporation
KBD	–	Kenya Dairy Board
MKU	**–**	Mount Kenya University
MoALF	–	Ministry of Agriculture, Livestock, and Fisheries
MSME	–	Micro-Small and Medium Enterprises
NACOSTI	–	National Commission for Science, Technology and Innovation

CHAPTER ONE

INTRODUCTION

This chapter presents the study on the assessment of the agricultural sector development support programme financing on productivity of dairy farmers in Meru County. The study background is on the capacity building, subsidies, marketing, and production resources and their influence on dairy farmers' productivity. The study purpose, objectives and research are highlighted in this chapter. The scope of the study, significance, limitations and delimitations are discussed. The chapter closes with definition of key terms.

1.1 Background to the Study

Dairy farming is a significant contributor to rural livelihoods and agricultural economies worldwide. Enhancing the capacity of dairy farmers through targeted programmes is essential for improving productivity, profitability, and sustainability. Support programmes for dairy farmers are critical in enhancing agricultural productivity, economic stability, and environmental sustainability. While challenges persist, adopting innovative methodologies and inclusive approaches can maximise the effectiveness and impact of these initiatives. The support for agricultural development has continued to be a key policy used by governments in developing nations to raise the standard of living for farmers, especially small-scale farmers who work directly in agriculture. Governments in developing countries have focused primarily on increasing rural income, food security, and food production through supporting agricultural activities (Liu, 2021). To achieve these goals, international assistance and developing country governments have invested heavily in enhancing flood control, expanding irrigation, improving physical infrastructure, and coordinating agricultural research and extension in rural areas (Faye & Konuspayeva, 2021). These investments range from direct interventions, such

as giving farmers seeds, fertiliser, subsidies and other inputs. Providing extension services and opening up markets are indirect interventions whose sole goal is raising farmers' living standards by increasing productivity. In Kenya, small-scale farmers who rely on agriculture directly and indirectly make up most of the population.

The FAO (Food and Agricultural Organization, 2024) estimates that 150 million households worldwide are involved in milk production. Small-scale farmers produce the majority of milk in developing nations, and milk production supports household livelihoods, food security, and nutrition. Milk is also a significant source of income and offers small-scale producers comparatively quick returns (World Bank, 2022). Global milk production has grown by over 77% over the past three decades, from 524 million tonnes in 1992 to 930 million tonnes in 2022, (FAO, 2024). With 22% of global milk production, India leads the world in this regard, followed by the US, Pakistan, China, and Brazil. However, developing nations have contributed more to the world's dairy production in recent decades (IFC,2020). However, according to the World Bank (2022), the primary cause of this growth was not an increase in productivity per head, but rather a rise in the number of producing animals.

Similar to other commodity markets, dairy markets are susceptible to price volatility due to specific characteristics (Park & Haenlein, 2020). There is minimal short- to medium-term variation in the milk supply in reaction to price fluctuations. Furthermore, the demand for dairy products only reacts weakly to price changes; as a result, changes in demand for dairy products necessitate significant price adjustments to balance the amounts provided and sought in dairy markets (Varangis, 2022). Despite these difficult economic circumstances, dairy farmers, like other small business owners, have put a lot of effort into making their enterprises to make them successful. Low and erratic wholesale milk prices along with rising milk production expenses have been their biggest obstacles.

Most farmers struggled to pay their bills during periods of low milk prices since they were not compensated for the cost of producing the milk. Due to volatile milk prices, dairy farmers have found it challenging to make future investments (American Farmland Trust 2018). It was also difficult for dairies to turn a profit during periods of low milk prices due to fluctuating federally fixed milk prices and the high cost of milk production according to the Massachusetts Department of Agricultural Resources (2018), Agricultural development support programmes were designed to overcome these challenges to assist farmers to step up production and increasing dairy sustainability.

The core of Kenya's economic growth is thought to be agriculture (Ngeno, 2018). Food security, raw material production, employment opportunities, capital formation, foreign exchange, and economic growth are all greatly aided by agriculture. Generally speaking, over 40% of Kenya's GDP comes from agriculture. Small-scale farmers, and small holdings, provide more than 60% of Kenyan workers with employment opportunities, according to GoK (Government of Kenya, 2017). Less developed countries have had low agricultural productivity. The use of antiquated farming technology, inadequate irrigation systems, conventional farming practices, and small holdings have all been blamed for the low yields. Due to these poor agricultural yields, there is now a vicious cycle of poverty marked by low savings, low investments, and low incomes (USAID, 2018). As a result, ASDSP (Agricultural Sector Development Support Programmes) was initiated to support and enhance agricultural practices. Another important factor for raising agricultural productivity was agricultural financing (IFC,2020). Financing is a crucial tool that gives small-scale farmers control over their investments, working capital, and consumption goods (Balana & Oyeyemi, 2020); small-scale farmers can purchase the required equipment and agricultural inputs thanks to the ASDSP financing.

According to Endurance & Nathan (2021), productivity is a relative concept that can sometimes be defined as an individual's capacity to produce more economically and efficiently and the ratio of output to the corresponding inputs used, or the efficiency of productive units. According to this study, agricultural productivity is the ratio of output to inputs about the quantity of labour, farm inputs, and technology used in dairy farming. Smallholdings, traditional farming practices, inadequate irrigation infrastructure, the lack or improper use of modern farm technology, etc. are some of the reasons why agricultural output was low in developing nations (Ruzzante, Labarta, & Bilton, 2021).

Productivity is the farm's capacity to transform production inputs into production outputs (Stephenson, 2019). Compared to a less productive farm, a more productive farm has a higher output-to-input ratio. Productivity growth describes how output/input ratios evolve (Figure 1). Productivity measurement can assess how much dairy farmers have adapted to new technologies through innovation adoption or adjustments to resource usage and production organisation (Ureta & Neubauer, 2021). The impact of additional off-farm variables, such as modifications to the market environment, new process technologies, and adjustments to institutional and regulatory frameworks, can also be assessed. Especially in the short term, it is important to remember that productivity is conceptually distinct from financial performance metrics like revenue, income, and profit. Enhanced productivity does not always translate into increased farm profits, and vice versa according to Kimura and Sauer's (2015) model below.

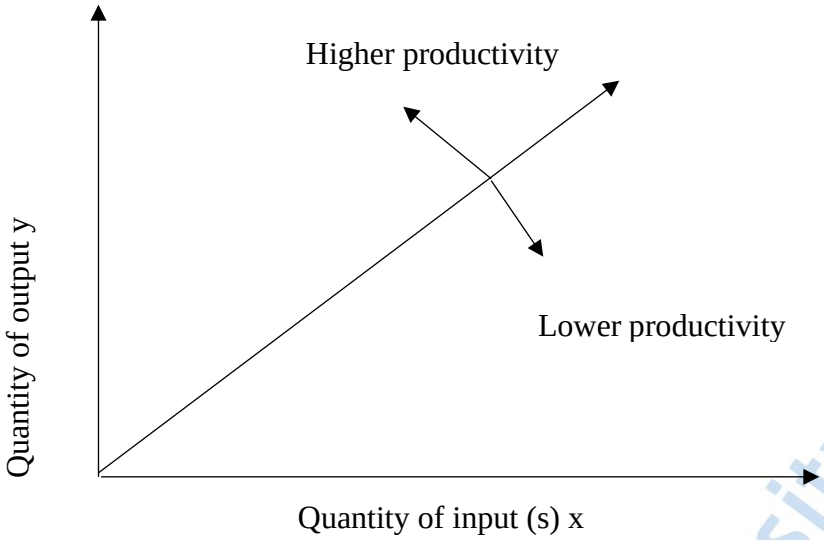

Figure 1: Graphical illustration of Dairy farm productivity growth

Source: Stephenson (2019).

Globally, Arisoy and Abdullahi (2023) assessed agricultural assistance programs based on nations' levels of development. The study was conducted in the U.S. and the EU under the headings of agricultural payments and supports. Additionally, the study aimed to compare the agricultural policies of a few developed and developing nations, including Turkey. For the research, the scholars first discussed the agricultural sector's economic, employment, and foreign trade share based on data. Next, they looked at the financial support for agriculture in the US, EU, and Turkey. Lastly, they compared agricultural support programmes in developed and developing nations. According to the study's findings, federal farm policy in the US had historically prioritized price and/or income support initiatives that target cash crops. Additionally, the system of producer-based support was embraced as a fundamental principle by the EU, whereas the system of product-based support was adopted by Turkey. Furthermore, the study underlined the

need for Turkey to address the structural issues in agriculture and transition to product-based support.

In the USA, Whitman (2020) researched to analyze the significance of state programmes on dairy farming focusing on its contribution and impact on dairy productivity. The study was conducted in Massachusetts on the Commonwealth of Massachusetts dairy farming that targeted 100 dairy farmers. The study was conducted to address a decline in the number of people involved in dairy farming. The survey found that dairy farming contributed to economic growth through jobs, revenue, taxes, and local purchases. The federal and state governments supported dairy farmers to improve their dairy enterprises and land conservation. The study further established that the dairy farmer tax credit program was one of the support programmes incorporated in Massachusetts for dairy farmers to increase the viability of dairy farming. In Warsaw Poland, Gaworski, Siuda & Kruszewski (2020), conducted a study to analyze indicators of productivity of dairy farmers. The study was conducted on six selected dairy farms. The results established that dairy productivity was influenced by several factors such as the amount of feed, type of cow breed, farm agricultural structure and pasture content. In India, Anjani et al. (2019), found that small-scale dairy farmers dominated milk production and milk production was directly proportional to the farm size.

In South Africa, Mokoena, Ntuli, Ramarumo, and Seeletse (2023) evaluated the challenges faced by small-scale dairy farmers in South Africa's North-West Province. The high cost of feed and fertilizer, infections and the expensive cost of medications, erratic weather patterns, interruptions in power, high electricity costs, cattle theft, lack of machinery and equipment, and a lack of support were identified as major problems. According to the report, governments should provide monetary support and assistance to fairy farmers so they may run and maintain their enterprises and get training.

The study's qualitative methodologies included reviewing government-commissioned reports, working papers, important CASP discussions, books, peer-reviewed journals, and internet sources. The study concluded that to support long-term government investments for CASP, resource allocation priorities were crucial. To bridge the investment gap in agriculture, the study suggested a coordinated policy environment that would enable private company investors to participate and support the sector. It was suggested that more agricultural research and development, the development of human capital, the creation of biophysical capital, and better institutions remain unique.

In Kenya, dairy farming supports the production of cash crops and food. Smallholder dairy farming is common and dominates the dairy industry in terms of milk production because of the restricted land sizes. Since dairy sector liberalization in 1992, the industry has experienced tremendous growth and the informal milk trade which is primarily made up of small-scale businesses that market raw milk has grown quickly (Maina, 2019). An estimated 70% of Kenya's milk sales were controlled by the unofficial milk market KDB (Kenya Dairy Board, 2019). Traditional tastes for fresh raw milk and its comparatively lower price were two of the main drivers of this significant industry. The dairy industry has a wide range of participants, including those who provide services and inputs, industry facilitators and development partners, and service and input consumers. At the production level, the dairy industry is dominated by smallholder farmers.

The Kenya Dairy Board (2024), claims that Kenya's dairy industry is the best in East Africa and among the best in Africa. The industry is expected to grow between 3 and 4 per cent annually, indicating its upward trajectory. A significant socioeconomic enterprise, the dairy value chain contributes 4.5 per cent, 14 per cent, and 44 per cent of the country's GDP, the agriculture subsector, and the livestock subsector, respectively. The industry employs an estimated 750,000 people directly and 500,000 indirectly,

supporting an estimated 11.8 million smallholder households. According to current estimates, the industry produces 40.6 billion litres of milk annually. The first quarter of 2024 also saw a 30.1% increase in milk deliveries to processors. In the first quarter of 2024, the sector was expected to have grown by 6.4%, compared to 6.1% in the first quarter of 2023. Government initiatives such as ASDSP financing and favourable weather conditions were credited with the sector's success. A rise in milk deliveries to processors from 166 million litres in the first quarter of 2023 to 216 million litres during the reviewed period suggests that production has improved.

Increased milk production and the exploitation of formal milk marketing will increase dairy production, which will raise dairy farmers' incomes (Maina, 2019). According to Kenya Dairy Board (2021), the daily processing capacity of major milk processors and mini dairies was 475 million liters. However, the KDB be noted that there was underutilization of their processing capacity. This was evident when the average daily milk intake for the months of January, November, and December 2020, for instance, was just slightly over 271 million liters. Less than two million liters of milk were consumed daily on average during the remaining months of 2020, (KDB, 2021).

1.1.1 Agricultural Sector Development Support (ASDP)

The Agricultural Sector Development Strategy (ASDS) 2010–2020 was created by Kenya's agricultural industry. The overall goal was to modernize and commercialize the agricultural sector to attain an annual growth rate of 7%. The implementation of the Agricultural Sector Development Strategy Programme (ASDSP) began in January 2012 after it was developed in 2010 and 2011. The Swedish and Kenyan governments shared funding for the initiative. To transform Kenya's agricultural sector into an innovative, commercially oriented, competitive, and modern industry that will contribute to poverty reduction, improved food security, and equity in rural and urban Kenya was the program's

overarching objective, which was in line with the ASDS. The specific goal was to improve production and productivity in the rural smallholder farm and off-farm sector, leading to increased and equitable incomes, employment, and food security for the target groups.

One of the main obstacles to the commercialization of the agricultural sector was identified as low productivity, which was typified by low production levels and irregular supply of traded commodities along the value chain. ASDSP aimed to address this issue by providing interventions to help value chain actors in the prioritized value chains (PVCs) become more productive. The ASDSP was intended to be a nationwide program, and the decentralized units in every county were crucial in assisting ASDSP financing in managing the devolution process. Following the March 2013 elections, the County Governments (CG) were formed, and the ASDSP units promptly took steps to build cooperative relationships with the new CGs. The program lost its primary mechanism for delivering sector coordination results of component one when the previous ASDS coordinating mechanism, including the Agricultural Sector Coordination Unit (ASCU), collapsed during the change in ministerial structure. In response, the program adopted a narrow sector coordination approach, supporting the transformation initiative of the Ministry of Agriculture, Livestock, and Fisheries (MoALF). Support for the Transformation Secretariat, and especially the Intergovernmental Secretariat, ensures the importance of assisting the sector in coordination.

To promote the establishment of commercial enterprises, the Agricultural Sector Development Support Programme (ASDSP II) was launched to enhance the entrepreneurial abilities of the key value chain participants and service providers. Through the development of entrepreneurial skills and the improvement of pertinent technical skills, it specifically sought to develop value chain actors and service providers

in the priority agricultural value chains. One of the key drivers of food security and steady incomes is the commercial agricultural value chain. The program focused on developing the entrepreneurial skills of value chain participants and service providers to increase commercial Micro-Small and Medium Enterprises (MSME) and increase sustainable incomes and food security. Value chain participants could launch, expand, and establish their businesses to economic scales that would support and maintain market access for profitability and financial viability with the help of an active programme entrepreneurship strategy. It supports the analysis and evaluation of entrepreneurial skills, the creation of a directory of resources for the target group, and the intensive development of entrepreneurial capacity.

1.2 Statement of the Problem

According to IDF (International Dairy Federation, 2024), milk production growth was predicted to return to the long-term average of slightly above 2% in 2021, driven by changes in consumption patterns, rising per capita income in developing nations, and the 92 million-person increase in the global population. Most nations' economies depend heavily on agriculture, which gives their rural populations their primary source of food, revenue, and jobs. Nations continue to engage in agricultural operations because the agricultural industry is fundamental to their economic growth. Over the next ten years, fresh milk consumption is predicted to rise dramatically worldwide, with developing nations expected to see the biggest increase (OECD-FAO, 2017). Smallholder dairy farmers, who are the main producers in the developing world, stand to gain from the rising demand for fresh milk (FAO 2024; Shikuku, 2019). However, because of their low educational attainment, low milk production per cow, poor milk quality, and restricted access to high-quality inputs, capital, and financing, smallholder dairy farmers are less able to benefit from this market expansion in these countries (Balana & Oyeyemi, 2020;

Anjani et al., 2019; Morey 2019; Ngeno 2018). Further, the adoption of better farm management techniques and technologies by farmers had been hampered by these constraints according to Ifft (2019).

Small-scale dairy farmers control the majority of the market and the growing demand for dairy products offers a huge market opportunity both nationally and regionally signifying the opportunity for them to grow. Kenya consumes the most milk in Sub-Saharan Africa, with an annual per capita consumption of 110 litres, and is predicted to increase to 130 litres by 2030 (National Dairy Master Plan, 2010-2030). Nonetheless, this necessitates that farmers take steps toward improving economic efficiency and productivity. Kenyan dairy farmers' productivity is impacted by the high cost of producing milk and frequent fluctuations in milk pricing (KDB,2020).

Numerous studies have shown that the productivity of small-scale farmers' farms is influenced by many characteristics, even though agricultural production varies amongst small-scale farmers (Beber et al., 2019; Pieralli, Hüttel, Odening, 2019; Sinyolo and Mudhara, 2019). On the other hand, there is heterogeneity among the various forms of assistance since individual farmers receive extra help, which has varying effects on food security, income, and productivity. Lack of access to agricultural support services was a major contributing factor to small-scale production's poor performance, even though such services are essential for increasing agricultural productivity, income, food security, and household poverty (Mokgomo, 2020).

Kirea's (2023) study established that the Tigania East sub-county had many small-scale dairy farmers but the region was characterised by low farmers' productivity. The specific goal of ASDSP was to improve production and productivity but there may be no assurance that small-scale farmers' increased productivity and standard of living had resulted from receiving such assistance. Further, very limited or no studies have been

conducted to ascertain the attainment of these goals especially in Meru County. It was against this background that the researcher sought to examine the impact of Agricultural Sector Development Support Programme (ASDSP) financing on the productivity of dairy farmers in Meru County.

1.3 Purpose of the Study

This study investigates the assessment of agricultural sector development support programme financing on the productivity of dairy farmers in Meru County.

1.4 Objectives of the Study

i. To investigate the influence of capacity building on the dairy farmers' productivity in Meru County
ii. To establish the influence of subsidies on the dairy farmers' productivity in Meru County.
iii. To assess the influence of marketing strategies on the dairy farmers' productivity in Meru County
iv. To evaluate the influence of production resources on dairy farmers' productivity in Meru County

1.5 Research Questions

i. What is the influence of the capacity building on dairy farmers' productivity in Meru County?
ii. What is the influence of subsidies on dairy farmers' productivity in Meru County?
iii. To what extent have the marketing strategies influenced dairy farmers' productivity in Meru County?
iv. What are the influence of production resources on dairy farmers in Meru County?

1.6 Significance of the Study

The significance of dairy farmers' support programs in Kenya lies in understanding their impact on agricultural productivity, rural livelihoods, and economic development. Dairy farming is a critical sector in Kenya's economy, contributing significantly to GDP and rural incomes. The findings will be useful in evaluating the program to identify how well it enhances farmers' productivity and profitability since many rural households rely on dairy farming as a primary source of income. A support program can potentially uplift their livelihoods by improving milk production, reducing costs, and enabling market access. Dairy products play a significant role in nutrition. Understanding how the program influences milk availability and affordability contributes to the broader goal of enhancing food security in Kenya. Therefore, the findings will inform government policies and strategies aimed at empowering smallholder farmers and addressing challenges such as market inefficiencies, poor infrastructure, and limited access to credit or technology. The study will uncover areas where the program may not be achieving its objectives, such as gaps in training, accessibility, or farmer participation, enabling improvements and more targeted interventions. This study will provide the scholars with a model that can be replicated or scaled in other regions facing similar challenges in the dairy sector and it will be an addition to the existing body of knowledge.

1.7 Scope of the Study

The scope of the study was on the assessment of the Agricultural Sector Development Support Programme (ASDSP) financing on the productivity of dairy farmers in Meru County. The study focused on Meru County with specific attention to dairy farming regions in the administrative units, including sub-counties where ASDSP financing has been implemented. The study targeted dairy farmers who have directly benefited from

ASDSP financing, and farmers affiliated with cooperatives, associations, and groups supported by the program. Both quantitative and qualitative methods were used in data collection. There are various facets of ASDP financing programs such as chicken rearing, banana production and dairy farming but this study focused on dairy farming.

1.8 Limitations of the Study

These are factors that posed challenges or constraints to the study and are beyond the control of the researcher. The study focused on dairy farming only, excluding other agricultural activities. The study was limited to Meru County, and findings may not be generalizable to other regions with different socio-economic and ecological contexts. The study is dependent on the availability and accuracy of data from farmers and ASDSP records. Farmers may provide inaccurate or incomplete information due to recall bias or reluctance to share financial details. Limited time and financial and logistical resources restricted the ability to collect extensive data from all dairy farmers in Meru. The influence of ASDSP financing may take longer to manifest, and a study conducted within a short timeframe may not capture long-term effects.

1.9 Delimitations of the Study

The study was confined to Meru County therefore narrowing the focus to a specific region ensured a detailed analysis. The study targeted dairy farmers directly benefiting from ASDSP financing and excluded farmers involved in other agricultural activities. The study of productivity metrics limited analysis to dairy farming productivity indicators such as milk yield, income from dairy farming, and market access.

1.10 Assumption of the Study

In conducting this study on the assessment of Agricultural Sector Development Support Programme (ASDSP) financing on the productivity of dairy farmers in Meru County, the following assumptions were made:

a. ASDSP financing has been effectively implemented in Meru County, with adequate coverage of the target dairy farming population.
b. The dairy farmers who received ASDSP financing utilized the resources and services as intended.
c. The study respondents provided honest and accurate responses to surveys, interviews, and focus group discussions, and the indicators used to measure productivity (milk yield, income, market access) accurately reflect the outcomes of the financing program.
d. The study further assumes that key stakeholders, including farmers, program officers, cooperatives representatives, and county dairy officers, cooperated fully in providing data and insights necessary for the study.

1.11 Operational Definition of Key Terms

Capacity Building : Capacity building is the process of developing and strengthening the skills, knowledge, resources, and systems of individuals, organizations, or communities to achieve sustainable growth and effectiveness.

Dairy Production: Refers to the process of producing, processing, and distributing milk and milk-based products. It primarily involves the raising

and management of dairy animals for the purpose of harvesting their milk.

Dairy Products : Dairy products are foods made from the milk of mammals, such as cheese, yogurt, butter, cream, and milk itself.

Farmers' Productivity : Dairy farmers' productivity refers to the efficiency and output of milk and dairy products generated per animal, worker, or unit of input on a farm.

Marketing Strategies: Marketing strategies are plans and tactics designed to promote products or services, attract target audiences, and achieve business goals through channels like advertising, pricing, branding, and distribution.

Modernization: Dairy farm modernization is the adoption of advanced technologies, practices, and infrastructure to improve efficiency, productivity, animal welfare, and sustainability in milk production.

Small-scale Farmer: A small-scale farmer is an agricultural producer who operates on a small plot of land, typically relying on family labour and limited resources to grow crops or raise livestock primarily for subsistence or local markets

Subsidies: Subsidies are financial support or incentives provided by governments to individuals, businesses, or industries to reduce costs, promote economic activities, or achieve policy objectives.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter, the researcher will discuss in detail the literature that exists about the study. The chapter will cover an empirical literature review, theoretical review, conceptual framework and theoretical framework as pertains to the area of the study. The empirical review discusses capacity building programmes, subsidy programmes, marketing strategies and production factors and how their implementation influences the dairy farmers' productivity.

2.1 Empirical Literature

This section will present empirical studies in line with the research objectives focusing on how the implementation of capacity building for farmers, subsidy initiatives, marketing strategies, and production factors influences dairy farmers' productivity. The researcher will review published papers, articles and websites for literature that was related to the research topic to reveal any research gaps.

2.1.1 Capacity Building on Dairy Farmers' Productivity

Capacity building involves equipping individuals and communities with the knowledge, skills, and tools necessary for sustainable development (Dawkins, 2017). In dairy farming, capacity building focuses on enhancing farmers' technical skills, for example, animal husbandry, breeding, and disease management; improving access to markets and financial resources, promoting environmental sustainability and climate resilience and strengthening organizational and cooperative development (Orea & Wall, 2018). It is widely established that small-scale farmers in rural regions lack information, education, and other farming skills (Morey 2019 and Ngeno 2018, USAID, 2018). Extension

services and assistance with agricultural training were revealed to be crucial for the sector's growth and according to Tsado et al. (2019), if farmers are given the necessary training and support to incorporate new technology into their production processes, they could boost their output and earnings. Agricultural training and short courses offered by recognized service providers and agricultural institutions seemed to be another term for or similar to extension services (Aliber et al., 2019).

The success of a dairy farm and the well-being of the cattle depend on having qualified workforce to handle the day-to-day dairy farm operations. Being aware of the correct way to manage dairy cattle guarantees both animal and human safety. According to Waitinger et al. (2022), the productivity of dairy cows and farm profitability could be improved by improving the human-animal interaction in dairy operations. This was because proper handling of dairy cows significantly reduced the stress that the cows experience during the process, as well as the stress and frustration of the employees handling the cattle. The mode of training includes on-farm demonstrations, workshops, and digital platforms, and according to Dinesh & Singh (2018), hands-on training has a higher productivity rate among dairy farmers compared to theoretical approaches.

Muhammad (2020), asserted that cattle housing had a major influence on dairy performance. Dairy animals intended for milk production must be kept in circumstances that may help the cows avoid stress and, as a result, be able to produce milk. Despite their importance in preserving the best possible calf performance, many dairy farms had subpar housing facilities that led to morbidity and deaths. Thornton and Gerber (2019) added that improvements in nutrition, cattle breeds, and the emphasis on housing were the main factors in the modernization of dairy production and that a healthy breed of cow produced enormous amounts of high-quality milk.

Improvements in milking sheds and equipment, genetics, artificial insemination, the use of automatic cup removers, and more soil testing were some of the technologies and production practices that contributed to the growth in dairy productivity (Mackinnon et al. 2019). In most countries, improvements in cattle breeds and feed quality have contributed to an increase in the average milk yield per cow. Australia's milk yields increased between 2007 and 2018, primarily due to the implementation of new technologies and management systems, according to Nossal and Sheng (2020). Because milking requires a lot of labour, technology has advanced to include labour-saving devices like automated milking parlours. Technological advancements that save labour enabled dairy farmers to manage more cows with fewer operators, resulting in economies of scale. MacDonald et al., for example. (2017) discovered that the United States' large dairy farms had a significant cost advantage. However, rather than technology, Tauer and Mishra (2018) discovered that economic inefficiency was the reason behind the higher production costs of many smaller dairy farms in the US

Tsado et al. (2019) examined how the training program affected the income and well-being of rice farmers in Nigeria's North Central Zone. According to the findings, farmers who took part in the training program earned substantially more than those who did not. The findings imply that the income of rice farmers in the research region increased as a result of program participation. According to Muzah (2018), there are several types of extension services, such as fee-for-service, innovation platforms, training and visitation systems, and farmer field day, methods that were used to support farmers. Tsado et al., study focused on the productivity of rice farmers in Nigeria while the current study focuses on dairy farmers' productivity in Kenya.

According to the Dairy Development Authority (DDA) Report (2020), Uganda's milk output increased from 70% of total production in 2014 to 80.2% in 2018 as a result of

modernization initiatives in the dairy farming sector. Investments in dairy infrastructure, such as facilities for milk collection and refrigeration, improved milk quality and decreased post-harvest losses. Additionally, the effort to modernize dairy farming and increase milk production was on a positive trajectory over the years reviewed thanks to strategic interventions like the adoption of improved dairy breeds, the provision of better pasture seeds and planting materials, training dairy farmers in efficient farming practices, and more (DDA, 2020). A combination of technological advancements, better breeding practices, infrastructure development, regulatory support, and positive socioeconomic outcomes led to the remarkable success of dairy farming in Uganda. According to Balikowa (2018), the modernization of dairy farming aided in its expansion in Uganda, making it the second-largest contributor to the country's GDP after cereals.

Nundu, Wakhungu, & Muyekho's (2020) study's objective was to examine smallholder farmers' nutritional management strategies and their effects on productivity. 400 smallholder farmers were selected at random from each ward to take part in the study, which was conducted in Kakamega Central Sub County. Data was gathered using structured questionnaires, interviews, and observation checklists. The findings demonstrated a strong correlation between dairy productivity and nutritional management practices; farmers who fed their animals enough supplemented them with minerals, gave them unlimited water, and vaccinated and dewormed them had a high potential for milk production. Despite the county government's efforts, the results also showed that the majority of smallholder farmers (95 per cent) practiced poor nutritional management, which contributed to the region's low milk productivity. This study cannot be generalized as it studied nutrition management while the current study focus on agricultural sector development support programmes financing on dairy farmers in Meru County.

In the Tigania East Sub-County, 156 smallholder farmers were chosen at random from three agro-ecological zones, with 52 respondents per zone, to participate in a survey conducted by Kirea (2023). The respondents were chosen using stratified random sampling. The findings revealed that farmers were using either a zero-zero or semi-zero grazing system. Dairy farming was the primary source of income for 27% of farmers with an average of twelve years of dairy farming experience, and the majority of farmers (78–40%) owned one or two dairy cattle. The breed type and breeding techniques, including artificial insemination, were found to be significant in milk productivity with p-values less than 0.05. By using high-quality feeds, having sufficient knowledge about dairy farming, expanding the area planted to fodder, and adding animal feed supplements, farmers were likely to boost their milk production. The grazing system, use of extension services, and record-keeping were all significant with p-values of 0.005, 0.047, and 0.005 respectively.

Maina, (2019), assessed dairy farmers' economic efficiency of milk production. The study was carried out in Mukurwe-ini Nyeri county on small-scale dairy farmers. The study used a cross-sectional design to collect data from 71 dairy farmers using semi-structured questionnaires. Factors associated with economic efficiency were analyzed using the Tobit Model while technical, allocative and economic efficiency in milk production were analyzed using the Stochastic Frontier Model. The results showed that farmers had 68.7%, 91.3% and 62.6% in technical, allocative and economic efficiency respectively. The study established that low economic efficiency in milk production was caused by a lack of technical efficiency and was prevalent in older farmers. The study recommended the provision of technical assistance to dairy farmers to increase efficiency and enhance their productivity. The above studies cannot be generalized because they were conducted in different geographical areas with diverse ecological and socio-

economical aspects to production. Therefore, this warrant to conduct the current study to access the impact of capacity building on dairy farmers' productivity.

2.1.2 Marketing Strategies on Dairy Farmers' Productivity

According to Vidal (2021), commercial dairy farmers market less than 1% of their milk and other dairy products. The scholar further indicated that most farmers sold their milk on the black market, which was characterised by milk delivered by bicycle from the farms to small family households that required milk for everyday consumption. Poor milking and handling techniques had a significant impact on the quality of the milk sold, according to Atuhaire (2020). The marketing of milk was hindered by milk quality and was negatively impacted by the widespread practice of storing and transporting it in plastic containers, especially jerry cans. Finding consistent and lucrative markets for dairy products was also a common problem for dairy farmers (Saravanadurai & Muthuraj, 2018).

Increasing local demand for dairy products created market prospects for Indonesia's smallholder dairy producers. However, low production and poor milk quality hindered most smallholder dairy producers from taking advantage of these opportunities (Statistics Indonesia, 2021). Nilabja et al. (2019) found that milk production was not commercially profitable. According to the study, the majority of milk production was still a subsistence endeavour. Large regional differences existed in milk prices, animal stocks, and profits, as well as in the degree of urbanization of districts and the primary occupations of producers. The findings additionally demonstrated that the producer's compensation differed according to the marketing channels used. Even though unofficial vendors continued to control the market, there was evidence of the arrival of private corporate purchasers. Anjani et al. (2019) found that smallholders were becoming more and more dominant in India's milk production. It was discovered that the size of the farm was

directly correlated with the average milk production of the household. A systematic bias against the involvement of impoverished smallholders in organized milk marketing outlets was also examined in this study.

In India, due to the involvement of many factors like lack of infrastructure facilities, transportation, interference of intermediaries, less bargaining capacity and lack of knowledge about the marketing conditions Kerala's milk marketing was facing huge challenges and constraints. The Priyanka & Harikumar (2021) study found that more than 70 per cent of milk was sold to a dairy cooperative society which implied that a traditional marketing channel dominated in Kerala. 330 co-operative societies of Milma district were chosen to participate in the study. Findings established that many farmers could not find a market for their products which created pricing problems thereby lowering the profit. The study further revealed that due to the higher price, selling milk to consumers/households was more profitable and beneficial to farmers than any other marketing channel. Proper marketing strategies were essential for the better and successful running of dairy farms.

Ngabirano et al. (2020), claim that the development of milk-collecting networks in Uganda enhanced connectivity between farmers and markets, preserving steady revenue flow and encouraging ongoing dairy production participation. Milk marketing turned out to be a lucrative source of income for both dairy farmers and traders. The development of dairy value chains and a move toward a market-oriented strategy was essential to Uganda's dairy farming increased productivity. The creation of official dairy cooperatives and the inclusion of smallholder farmers in value chains increased market access, enhanced milk quality, and encouraged the adoption of new technologies, according to a study by Kugonza et al. (2019).

In Kenya Bungoma County, Koyi and Siamba (2020) evaluated how marketing strategies affected dairy value chain returns. The study aimed to examine the potential of marketing strategies for dairy products to alleviate poverty and enhance food security. A correlation research design was adopted while simple random and purposive sampling techniques were used to obtain a sample size of 711 respondents. According to the study findings, dairy producers frequently engaged in informal marketing of their products. Other marketing tactics included cooperative societies and contract marketing. Price, market access, available market intelligence, and demographic variables all have an impact on marketing techniques. Marketing techniques had a considerable impact on dairy value chain returns on food and nutrition security, accounting for 27.3% of the variation. The study revealed that dairy marketing methods have a major impact on food and nutrition security. The study proposed a coordinated effort to improve returns from informal marketing to enable food security and sustainable development.

KDB (2021), found that most farmers were concerned about raw milk pricing because they believed that the payments they got from processors were insufficient to pay for their supply. Despite rising production costs and consumer prices, producer prices were seen to remain constant. KDB analysis highlighted the necessity of addressing the problem of low producer prices paid by cooperatives and processors, which then deduct a management fee, further lowering farmer revenues. Increasing producer prices was revealed to be crucial for establishing incentives for the production of dairy farmers.

2.1.3 Subsidies on Dairy Farmers' Productivity

Spio (2019), suggested that a household's livelihood indicators, including food security, agricultural production, and adoption of technology, are influenced by credit availability. For small-scale farmers in South Africa, a major obstacle was the lack of financial capital,

despite its substantial contribution. Although some banking programs were able to offer credit, small-scale farmers received less financial assistance than commercial farmers. Even with these financial resources available, several small-scale farmers were unable to obtain credit because the high transaction costs prevented them from providing the collateral (Sikwela & Mushunje, 2018). The scholars urged the governments' help to stabilize dairy product prices, find markets for dairy products to boost the industry's morale as it modernizes, provide tax breaks and incentives for dairy farming inputs and milk products, increase farmer capacity building, and boost funding for the dairy farming industry.

A study by de Rosari et al. (2020) examined the effects of credit and capital support allocation and demand on investment, consumption, and production in Indonesia's East Nusa Tenggara Timur province. The study's conclusions implied that the distribution of capital and credit encourages the beneficiary household to invest, consume more, and produce more cattle. Awotide et al. (2019) investigated how credit availability affected Nigerian cassava cultivation productivity and found that credit availability had greatly increased cassava yield. The traits and variables influencing small-scale farmers' ability to obtain credit were investigated by Spio (2019) in South Africa. The findings demonstrated that there were differences in agricultural productivity between credit and non-credit borrowers. Nonetheless, having access to credit can boost farmers' productivity. Farmers who received credit realized higher agricultural productivity than their counterparts who did not receive credit, according to the findings of a closely related study by Girabi and Mwakaje (2018) that examined the effect of microfinance on smallholder farmers' agricultural productivity in Tanzania's Iramba district. Access to institutional credit was discovered to be beneficial for farmers.

Sibande et al. (2018) evaluated how Malawi's fertilizer subsidy program's implementation affected daily kilocalories per capita, household food security status, the number of months in which households had food security and households' total annual per capita consumption expenditure. The findings showed that the fertilizer subsidy increased the food security of households. Nonetheless, the impacts varied depending on the population's distribution. In a related study, Seck (2019) evaluated the possible effects of fertilizer subsidies on farmers' productivity in Senegal. The findings indicated that subsidy programs were beneficial as they were linked to higher productivity. In Tanzania, Aloyce et al. (2019) investigated how the agricultural input voucher program affected smallholder farmers' productivity and food security. When comparing farmers who received agricultural input vouchers to those who did not, the researchers discovered that the former had greater agricultural productivity and less food insecurity. In Mozambique's Gaza region, Nyyssölä et al. (2019) investigated the efficacy of a farming development proposal that aimed to improve the standard of living for poor farmers who embraced new seed varieties and advanced technology, such as fertilizers. After the farmers' intensification, the author discovered that the aid intervention helped to stabilize food security and improve production in the short term.

In South Africa, Mokgomo (2020), researched how the livelihood of small-scale farmers was affected by the agricultural development programmes offered by the government to support farmers. The study established that the South African government's agrarian development support programmes effectively lowered food insecurity and enhanced the output and earnings of the small-scale farmers who benefited from such programmes. The study revealed funding of agricultural programmes enhanced farmers' capacity thereby increasing productivity. In KwaZulu-Natal, Sinyolo and Mudhara (2019),

established financial aid to farmers was used to reduce poverty and increase farmers' productivity.

In the Alego Usonga sub-county of Siaya County, Ambajo (2022), researched the impact of subsidies on households' income, crop yields and the farmers' productivity. The study further sought to determine the uptake of subsidies by farmers and their influence on agricultural productivity. The study employed random sampling to select 317 farmers as the participants. The findings revealed that agricultural input subsidies were effective in increasing crop productivity, raising the yield and increasing household income. This study focused on crop production and the main subsidy investigated was the fertilizer input while the current study focuses on dairy farming.

Kimoso's (2022), study's objectives were to estimate the percentages of subsidized fertilizer used, identify the socioeconomic factors influencing the percentages of subsidized fertilizer used in the total amount of inorganic fertilizer used, and ascertain how the subsidized fertilizer program affected the productivity of maize-grain among Kakamega County's small-scale maize farmers. To estimate the maize-grain yields that farmers achieve, the study used a Cobb-Douglas function and rational choice theory of production. The 44,098 farmers in the study population, who represent the sub-counties with the greatest and lowest numbers of farmers in Kakamega County, were intended to represent 80% of farmers engaged in maize farming. 300 farmers were chosen through a multi-stage sampling process, and the study used a cross-sectional survey design with semi-structured questionnaires to collect data from them. According to the results, participants in the subsidy program used an average of 59% of the subsidized fertilizer. Additionally, the results indicated that program participants used more fertilizer on average (85–6 kg/ha) than non-participants (74–9 kg/ha). The percentage of farmers who used subsidized fertilizer was influenced by the size of the farm under maize, household

size, number of seeds planted, age and education of the household head, distance to the input market, and amount of credit borrowed. The results of the Tobit model indicated that participation in the subsidy program resulted in an increase in maize-grain productivity by 32.3%.

2.1.4 Production Resources on Dairy Farmers' Productivity

Production on a dairy farm is the process of turning inputs like labour, milking cows, and fodder into output in the form of milk and livestock (Chibanda et. al. 2020). The ability of large and small farmers to produce is hampered by the high cost of the technologies used in milk production, such as cow housing feeding technologies, milking practices, and cooling procedures (Ash, 2018). Similar technology is used in dairy farm production, but there are differences in farm efficiency, economy of scale, and management and environment. Resources are both material and immaterial assets that smallholders use to support production, according to Endurance & Nathan (2021). Smallholders face significant obstacles due to the high relative costs of resources, particularly high-quality production assets. The provision of high-quality production assets through vertically integrated livestock food chains can help smallholders remain competitive.

For many nations, maintaining and improving natural resources while raising the agricultural sectors' production, efficiency, and competitiveness continue to be top priorities (FAO, 2024). Given the scarcity of land, water, and other resources, productivity growth and sustainable resource usage are crucial to supplying the world's expanding food demand. It is the main method by which nations can increase production concerning inputs, reallocate resources to other economic endeavours, and enhance the sustainability of agricultural resource usage. Therefore, governments and the agriculture sector share the objective of better understanding productivity trends and determinants and how they contribute to industry competitiveness and the long-term global food supply

(Alston et al. 2019). Every day, dairy farms produce milk which is a highly perishable commodity. To prevent bacterial growth which lowers milk quality, the milk should be delivered to the milk collection location as soon as possible. This is particularly crucial given that the majority of smallholder dairy farmers lack milk refrigerators to store their milk. To solve problems with dairy farmers' productivity and their limited economies of scale, the researchers recommended robust institutional support, which is frequently given through membership in dairy cooperatives to small-scale dairy farmers (Ariningsih, Saliem, and Erwidodo 2019).

The study conducted by Lima (2023) sought to determine the factors that affect the use of concentrate in dairy farms by examining farmers' perceptions of the features of the dairy system and their interactions with the dairy industry. Questionnaires were used to gather data from 155 dairy farmers in Brazil's Paraná State. The data was analysed using structural equation modelling with partial least squares. The theoretical constructs of concentrate feeding, forage, genetics, management, and market were used to gauge dairy farmers' opinions. The findings showed that the market construct which was defined by the number of interested buyers and the farmers' ability to bargain with the industry over milk prices and the genetic construct which is defined by herd genetics and breeding technology were the primary determinants of dairy farmers' decisions to implement concentrate feeding. Farmers' perceptions of the management construct (cost control and animal performance) and the forage construct (forage source and farmers' confidence in supplying forage to cows all year round) were also found to have an impact on concentrate feeding. According to these results, the following elements in order of significance should be the main focus of strategies meant to promote concentrate feeding in dairy farms: forage supply and availability, financial and herd management, farmer-industry relations, and genetic improvement to boost dairy farmers' productivity.

Sankar (2023) researched to assess the situation of dairy farming in India. From the viewpoint of dairy farmers, the study examined the effects of four factors on milk productivity: climate, milk handling, cattle feed, and cattle health. Information on milk productivity was gathered from dairy farmers through a questionnaire in a cross-sectional study employing inferential statistics. To support the positive hypothesis, the study used Smart PLS to analyze the measurement and structural models. The research utilized a combinative PLS approach, which was consistent with the features of a structural equation model. Additionally, a focused group analysis was conducted to get feedback and suggestions from the respondents. The results showed that the quality of milk productivity and the four independent variables are positively correlated. Feed expenses could also be decreased by using natural and organic methods for cattle feed. The use of appropriate concrete, sheds with efficient heat management and measures to address rainy season challenges, maintaining hygiene during milk transportation, and having access to government veterinary clinics, as well as ongoing support and possible private veterinary clinics, all benefited dairy farmers and increased milk productivity.

A study by Jones (2022) investigated how pastoralists' livelihoods would change if the identified obstacles were removed and if the pertinent parties were effectively involved in the marketing of livestock and livestock products. The livestock resource was the primary source of income for the pastoralists who made up the majority of the population in ASALs. To identify key themes and extract knowledge gaps, the study employed a desk study review methodology, reviewing pertinent empirical literature. According to the study, 80 per cent of pastoralists relied on livestock keeping as their primary source of productive capital, confirming its importance. Livestock and their surroundings were central to the social and economic organization of pastoral life. The efficient trade of

livestock and livestock products was hampered by several issues, including climatic, geophysical, economic, political, and social ones.

According to a study by the Tegemeo Institute of Agricultural Policy and Development on behalf of the Kenya Dairy Board (KDB, 2021), some dairy farmers spent a lot of money on cattle feeds but rarely turned a profit. Furthermore, it was discovered that a significant factor influencing the dairy subsector's financial success was the price of milk. Most farmers have long been concerned about the price of raw milk because they believe that the payments they get from processors are insufficient to pay for their production expenses. Despite rising production costs and consumer prices, producer prices have been seen to stay largely stable. The primary inefficiencies identified by the study included excessive electric energy costs for milk processing; seasonal milk supply and prices; multiple taxes on dairy products; high costs of agro-processing equipment and inputs; transaction agreements between distributors and retailers for milk and milk products; market competition issues in the processed milk market from informal milk traders, processor competitions, and low-cost imported milk products; and high costs of milk packaging materials.

According to KDB (2021), the average yield for zero grazers in 2019 was 3,641 litres per cow annually. Machakos had the lowest yield (2,640), while Kiambu had the highest (4,520), followed by Meru (4,200). The average daily production per cow was 10.1 litres. While Machakos recorded the lowest productivity at 7.3 litres, Kiambu, Meru, and Nyeri counties recorded the highest productivity at 12.6, 11.7, and 11.3 litres, respectively. Given that farmers in Nyeri and Kiambu primarily keep Friesian pure breeds, the genetic ability of the herd may be a major factor in the variations in milk yield. Despite owning cattle with high genetic potential for milk production, farmers in this production system only produced small amounts of milk each day. Underfeeding, subpar housing, and

subpar animal husbandry could be the cause of this. Due in part to the nation's lack of raw materials for feed processing, particularly those for protein, the majority of dairy farmers rarely feed their cows at least 3% dry matter of body weight as advised. The study areas' land sizes were also found to be insufficient to provide the necessary quantities of roughage. The focus group discussions revealed that farmers typically did not give cows enough concentrates and mineral supplements.

King'ori (2022) conduct research to identify the variables that affected dairy productivity. The study was motivated by the fact that Kenya's population has been steadily growing in both rural and urban areas; according to the most recent estimates, there are currently over 40 million people living in Kenya. Dairy production was encouraged by the market and price due to the large population. Production ought to rise in tandem with this increased demand. Still, there is a disparity between supply and demand. To identify key themes and extract knowledge gaps, the paper employed a desk study review methodology, reviewing pertinent empirical literature. The study discovered that several factors, including the social and economic climate, cattle breeds and breeding practices, input availability and cost, and technological adoption, all had an impact on dairy milk productivity.

2.2 Theoretical Review

This study was grounded on the Production Theory (PT) and the Resource Dependency Theory (RDT).

2.2.1 Production Theory

Production theory is a fundamental concept in economics that studies converting inputs into outputs. It focuses on the relationships between resources (inputs like labour, capital, and raw materials) and the goods or services (outputs) produced (Hassani, 2017). Production theory provides the foundation for understanding how businesses make

decisions about resource allocation, cost management, and production efficiency. The production function represents the relationship between inputs and the maximum amount of output that can be produced. The production function shows the dependence between the production result and the volume of resource use. The production function is a function that specifies the output of a firm, an industry, or an entire economy for all combinations of inputs presented mathematically by equation; Q = f (L, K, M) where Q is output, L is labour, K is capital, and M is materials. The function describes the technological constraints and efficiency in converting inputs into outputs. According to Ureta & Neubauer (2021), the application of production theory in dairy farming involves analysing how various inputs (land, labour, feed, equipment, technology) are used to produce milk efficiently and profitably on a farm.

According to Endurance & Nathan (2021), production growth is sometimes defined as an increase in the output of a production process. It often shows the growth of the actual production output as a growth percentage. Real income is calculated by deducting real input from real output, which is the actual value of the product generated during a production process. The actual process of manufacturing from the real inputs produces the real output and the real revenue. A production model is a numerical depiction of the production process that is based on input and output quality and pricing. By applying principles of production theory, dairy farmers can optimize resource allocation, increase productivity, and reduce costs.

2.2.2 Resource Dependency Theory

Pfeffer and Salancik (1978) proposed the Resource Dependency Theory (RDT), which holds that organizations rely on a variety of resources, including raw materials, labour, and capital. For without resources, organizations might not be able to launch business ventures therefore, organizations ought to adhere to the concepts of scarcity and

criticality. As a result, resource dependence theory affects many other facets of organizational strategy, including the best divisional structure for organizations at various levels. The theory is predicated on how an organization's external resources impact its behavior. This is especially true for on-farm dairy proposal diversification, which calls for funding or other resources to carry out (Slade & Hailu, 2018). Additionally, organizations rely on resources that ultimately come from their surroundings, which also include other organizations. According to this study, small-scale dairy farmers require resources from various sources to carry-on their dairy farming endeavours.

This study demonstrates how resource dependence and interdependence characterize dairy funding, the sustainability of milk production, technological adoption, and product marketing. Dairy diversification programs' scale, implementation pace, and sustainability are all impacted by resource uncertainty. It has been discovered that to significantly improve the livelihoods of smallholder dairy farmers, sustainable milk production, technology adoption, and farmers' support programmes continually depend on consistent investments (Larue, Singbo, & Pouliot, 2019).

Resource Dependency Theory (RDT) as posited in this study advocates for dairy farmers to reduce dependence on external resources to enhance their survival and performance. When applied to dairy farmers productivity, RDT highlights how farmers interact with their environment, manage resource dependencies, and reduce uncertainties to improve productivity. Dairy farmers rely on external resources like feed, technology, veterinary services, markets, and labour. RDT suggests that farmers should strive to secure stable, affordable, and high-quality inputs to reduce dependency and uncertainty by forming cooperatives to collectively purchase feed at lower costs, diversifying feed sources to avoid reliance on a single supplier and investing in water management systems to reduce dependency on fluctuating water supply. Additionally, farmers depend on markets for

selling milk and other dairy products. RDT can guide strategies to reduce dependence on volatile markets, such as establishing long-term contracts with processors or retailers, diversifying products (e.g., milk, cheese, yoghurt) to tap into different market segments and creating direct-to-consumer sales channels to bypass intermediaries.

Dairy farming often requires capital for equipment, herd expansion, and infrastructure. Farmers may reduce financial dependency by collaborating with microfinance institutions or cooperatives for favourable loan terms, using self-help groups or community-based savings systems to pool resources and applying government subsidies or grants to lower operational costs. Dependency on external expertise or technology (e.g., veterinary advice, milk testing equipment) can influence productivity. RDT emphasizes building internal capacities through training programs for farmers.

Partnering with agricultural universities or extension services for access to the latest technologies, and investing in on-farm technology to increase self-sufficiency (e.g., automated milking systems). ASDSP financing can employ RDT principles by consolidating small-scale farmers into a network. This reduced their dependency on individual buyers and empowered them through shared resources, better pricing, and market access as a result it enhanced productivity through assured input supplies, stable income, and capacity development. By leveraging RDT, dairy farmers can strategically manage their dependencies to optimize productivity, reduce risks, and ensure sustainable growth.

2.3 Conceptual Framework

A conceptual framework is a representation of ideas and objectives that guide the development and structure of a research proposal, theory, or approach (Kothari, 2014). ASDSP financing programmes is the main independent variable, and it is defined by sub-independent variables namely: farmers' capacity building, subsidy programmes,

marketing strategies and program sustainability. The dependent variable (dairy farmers' productivity) will be measured in terms of milk yield per cow, overall milk production, and the increase in household income for dairy farmers. The moderating variable will be the cow breed and weather patterns.

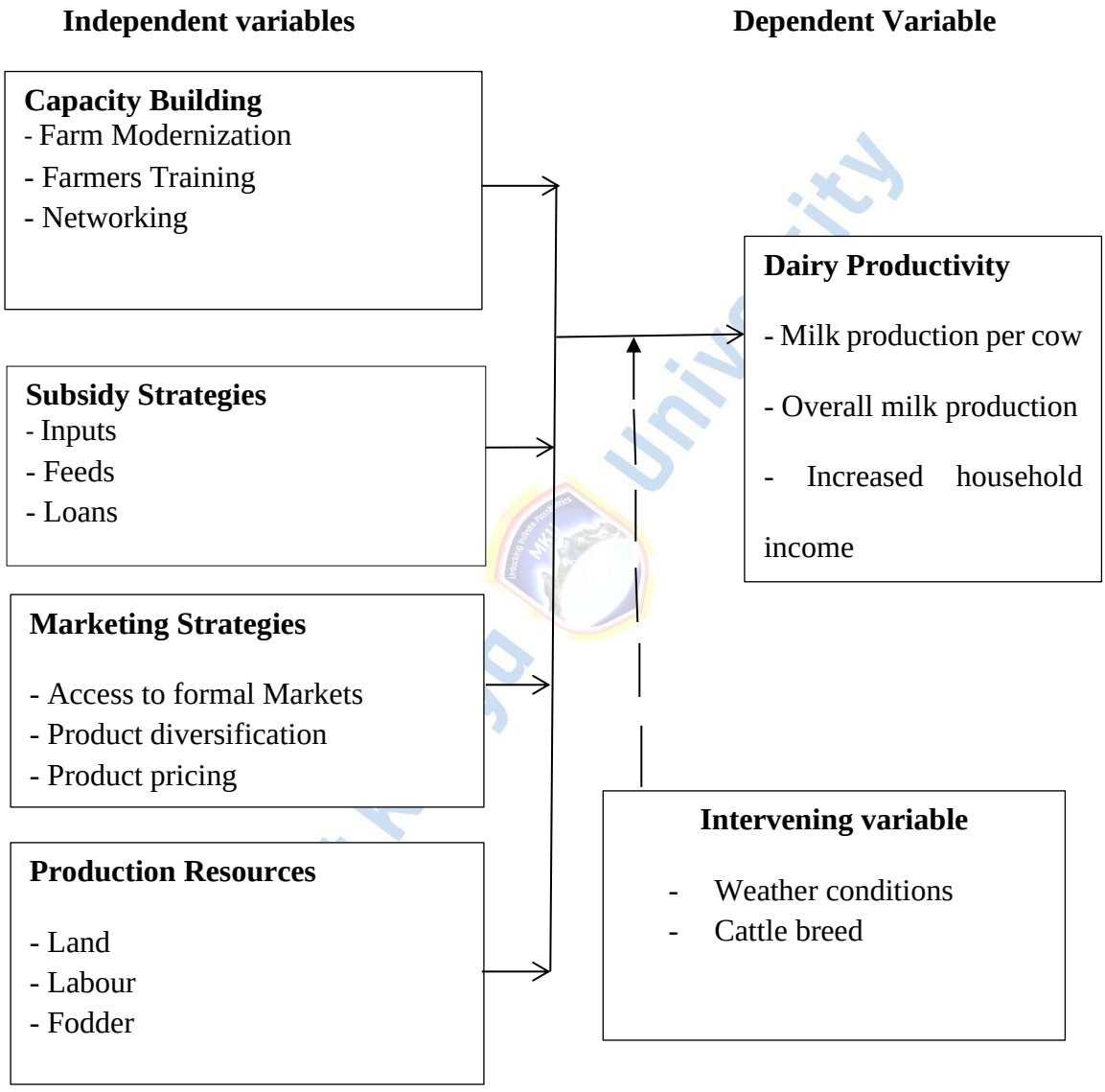

Figure 2: Conceptual Framework

Source: Researcher, 2024

2.4 Recap of Literature Review

Globally, dairy farming has been and continues to be a significant agricultural endeavour. Over 130 million farms own dairy cattle, with considerable variation in the number of cows per farm among nations. Food and Agriculture Organization (FAO, 2016), further stated that milk is one of the most valued agricultural products. In addition, cows provide rural households with a significant source of income, jobs, food, and livelihood. Dairy animals are a key tool for women's empowerment in underdeveloped nations. When it comes to consumption, whole milk and dairy products are an important source of vitamins, protein, and calories (USAID, 2018). These characteristics can be very important in reducing hunger and improving diets, nutritional levels, and food security (FAO, 2021). Food demand is predicted to quadruple globally by 2050 due to rising incomes and populations. Large amounts of extra food will need to be produced by farmers worldwide to meet this increase in demand. Global agricultural systems, including the dairy industry, will face significant opportunities as well as problems as a result of this population surge (Statistics Indonesia, 2021).

The literature reviewed have established that agricultural support programmes had a positive effect on farmers' productivity. The majority of programmes were aimed at raising agricultural production, ensuring food security and improving small-scale farmers' household livelihood. To address some of the issues faced by the agricultural sector, many policies are implemented regarding the growth and regulation of this industry. Some of the challenges dairy farmers faced were cited as low technical skills, limited information access, and high marketing and transaction costs. Duplication, disorganized efforts, and insufficient advancement toward national and county development goals of food security have resulted from a lack of policy cohesion and coordination. Further, diseases, limited access to markets and services, and low-quality

feeds limited dairy productivity in many developing nations making dairy farming untenable.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The research design, study site, target population, sample size, sampling technique, data collection, analysis, and presentation, validity and reliability of research instruments, and ethical considerations were the contents in this chapter.

3.1 Research Design

According to Cooper and Schindler (2011), research design was defined as a structured framework that outlined how the study was conducted and the features of a research proposal or program. The research design addressed the study objectives and how the researcher achieved them using data collection methods, interpretation, and analysis. This study adopted a descriptive research design. According to Kothari (2014), descriptive research design was effective in analyzing data as it enabled observation of phenomena in their natural settings. Descriptive research design was best suited for integrating both qualitative and quantitative data collection methods (Creswell & Creswell, 2018). Cooper and Schindler (2011) further stated that descriptive statistics were used to achieve a variety of objectives, including describing the characteristics of a particular group, ascertaining perceptions, determining the degree of association between variables, and ultimately formulating specific predictions.

3.2 Location of the Study

This research proposal was conducted in Meru County, which provided the geographical context of the study. Meru County comprised nine sub-counties, namely Buuri, Igembe North, Igembe Central, Igembe South, Tigania East, Tigania West, Imenti Central, Imenti North, and Imenti South. A location map illustrating the site of the study was attached in the appendices of the proposal.

3.3 Target Population

The target population of this study was composed of representatives of dairy farmers, dairy officers, ASDSP officers, and livestock development officers in Meru County. The table below presents the distribution of the study population (Meru County Department of Agriculture, 2024).

Table 1: Target Population

Departments	**Populations**
Dairy farmers' representatives	60
ASDSP officers	9
Dairy Officers	32
Livestock development officers	29
TOTAL	**130**

Source: Meru County Government Department of Agriculture, (2024)

3.4 Sampling Procedures and Techniques

Creswell (2013) defined sampling as the procedure employed by a study to select respondents, localities, or items to be studied. In this study, the researcher used stratified sampling to ensure a fair distribution of farmers' groups across sub-counties, followed by simple random sampling to select the representatives of the farmers. For the ASDSP officers, dairy officers, and livestock development officers, the researcher also employed

simple random sampling to select the actual respondents from staff lists. This was done by picking every *nth* name on the list until the required sample size for each group was attained. According to Saunders, Lewis, and Thornhill (2009), the use of simple random sampling ensured objectivity in the selection process by giving all respondents an equal chance of participation.

3.5 Sample Size

A sample is a subset of a population (Mugenda & Mugenda, 2012). This study had a sample size of 85 respondents. The Slovin's formula was used to determine the sample size, as it provided a statistically valid method for deriving a sample from a known population with a specified level of confidence.

$$n = \frac{N}{1+N\,(e)^2}$$

Where;

N= total population of 130

e = Confidence level which is 95%

n = Sample size

$$n = \frac{130}{1+130\,(0.05)^2} = 98$$

n= 98

The sample distribution per section will be calculated as follows

$$\frac{\text{Total number of staff in a given section} \quad x \quad \text{sample size (98)}}{\text{Total population (130)}}$$

Table 2: Sample size

Departments	Populations	Sample size	%
Dairy farmers' representatives	60	45	45.92
ASDSP officers	9	7	7.14

Dairy officers	32	24	24.49
Livestock development officers	29	22	22.45
TOTAL	**130**	**98**	**100**

Source: Researcher, 2024

3.6 Research Instruments

Questionnaires were used for the collection of primary data and contained both structured and unstructured questions. According to Kothari (2014), unstructured questions were useful for collecting qualitative data, allowing respondents the space to express their views pragmatically, while close-ended questions limited responses to variables of interest to the researcher. In addition, the researcher scheduled interviews with departmental heads in the ASDSP, Dairy, and Livestock Development offices.

3.7 Validity and Reliability of Research Instruments

The quality and credibility of research instruments were based on the concepts of validity and reliability (Cooper & Schindler, 2011). These principles ensured that the instruments used in the study accurately measured what they were intended to assess and produced stable, consistent results over time and under varying conditions. A pilot study was conducted to identify any issues related to the instrument's validity and reliability prior to its use in the main study (Kombo & Tromp, 2016). Additionally, experts were consulted to review the research instrument to ensure that it adequately captured the intended constructs and was suitable for the target population. The researcher also sought the supervisors' input during the questionnaire development process. Validity and reliability were considered essential for the development and application of the research instruments, as they directly influenced the quality and trustworthiness of the study's findings.

3.8 Piloting of Research Instruments

Orodho and Kombo (2003) suggested that the pilot study sample should constitute approximately 8% of the proposed sample size for the target population. Based on this recommendation, the researcher conducted a pilot study involving 10 farmers' representatives and 5 dairy officers, who were sampled randomly. These participants were excluded from the main study to avoid bias and ensure the integrity of the research findings.

3.8.1 Validity of Findings

Mugenda and Mugenda (2012) posited that, based on the researcher's findings, validity refers to the meaning and correctness of the inferences drawn from research results. It is the degree to which a research instrument accurately measures what it is intended to measure, reflecting the appropriateness and accuracy of the instrument for the specific concepts under investigation. To assess content validity, the researcher sought input from academic supervisors to evaluate whether the instrument adequately covered all relevant content areas related to the concepts being measured.

3.8.2 Reliability of Research Instruments

An instrument's reliability was determined by how consistently it produced data or results across multiple trials (Creswell & Clark, 2011). Reliability referred to the consistency of measurement results generated by an instrument, whereby a reliable instrument yielded similar outcomes under consistent conditions. Reliability was essential as it indicated the stability and dependability of the measurements. According to Creswell and Creswell (2018), researchers could use Cronbach's Alpha to test and estimate the reliability of a given instrument. In this study, Cronbach's Alpha was used to assess the reliability of the research instrument. Kombo and Tromp (2016) stated that a Cronbach's Alpha coefficient above 0.7 indicates that a variable is considered reliable.

3.9 Data Collection Methods

A structured and methodical approach was employed in gathering data. Prior authorization was obtained from Mount Kenya University by the researcher. Subsequently, the investigator submitted an application to the National Commission for Science, Technology and Innovation (NACOSTI) for a research license. Upon arrival at the study location, the researcher was granted permission to carry out the investigation. Before administering the questionnaires, the researcher established rapport with the respondents and clearly explained the purpose of the study. Both structured and unstructured surveys were used to collect primary data for the study. To allow respondents sufficient time to complete the questionnaires, the researcher collected the filled questionnaires two weeks after they had been distributed.

3.10 Data Analysis Techniques and Procedures

Effective data analysis was critical for drawing valid conclusions from the research. It required careful planning, execution, and interpretation, regardless of the methodological approach. In this study, quantitative data were analyzed using descriptive statistics, including measures of central tendency (mean), measures of variability (standard deviation), and percentages. Qualitative data obtained from open-ended questions were analyzed thematically in alignment with the research objectives. Quantitative data were further analyzed using inferential statistics. Correlation analysis and Analysis of Variance (ANOVA) were employed to examine the relationship between ASDSP financing and dairy farmers' productivity. The results were presented in tables to enhance clarity and facilitate interpretation.

3.11 Ethical Considerations

Ethics was defined as the set of norms for conduct that distinguishes between acceptable and unacceptable behavior (Mugenda & Mugenda, 2012). Ethics encompassed what was considered good for the individual, the society, and moral values. The researcher adhered to the ethical guidelines outlined by the Mount Kenya University Ethics Review Committee. A letter of research authorization was first obtained from Mount Kenya University, after which the researcher applied for a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). Informed consent was sought from all respondents, and participation in the study was entirely voluntary. Anonymity was maintained by avoiding the use of personal identifiers on the questionnaires. The researcher interacted with respondents when delivering and collecting questionnaires, which was done at their offices to ensure safety. All completed questionnaires were stored in a secure location to prevent unauthorized access. Throughout the study, proper credit was given to all authors by citing and referencing the sources of information used.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the data collected through questionnaires and interviews regarding the influence of Agricultural Sector Development Support Programme (ASDSP) financing on dairy farmers' productivity in Meru County. The findings are structured according to the study objectives and themes identified from the research instrument. The chapter begins by presenting the response rate, followed by an analysis of the respondents' socio-demographic characteristics. These insights provide a foundation for interpreting the subsequent thematic findings on capacity building, marketing strategies, subsidies, and production resources. The discussion integrates empirical literature and theoretical perspectives to support the interpretations made.

4.2 Response Rate

The response rate refers to the proportion of administered questionnaires that were successfully completed and returned. Out of the 98 distributed questionnaires, 91 were filled out and returned, giving a response rate of 92.86%. This high response rate is considered satisfactory for data analysis and generalization of results, as noted by Babbie (2020), who recommends a minimum response rate of 70% for survey-based studies. The high rate is attributable to follow-up calls and the researcher's engagement with field agents who facilitated access to respondents. According to Fincham (2018), such an effective response rate improves the reliability and representativeness of the collected data. The breakdown of the responses across the various categories of respondents is presented below.

Table 3: Response Rate by Category of Respondents

Category	Sample Size	Responses Received	Response Rate (%)
Dairy Farmers' Representatives	45	42	93.33
ASDSP Officers	7	6	85.71
Dairy Officers	24	22	91.67
Livestock Development Officers	22	21	95.45
Total	**98**	**91**	**92.86**

Source: Field Data, 2025

This response rate justifies proceeding with data analysis, as it reflects adequate representation from the targeted population, thereby increasing the robustness of the research findings.

4.3 Socio-Demographic Characteristics

Table 4: Socio-Demographic Characteristics of Respondents

Demographic Variable	*Category*	*Frequency (n)*	*Percentage (%)*
Gender	Male	55	60.44
	Female	36	39.56
Sub-county	Buuri	12	13.19
	Igembe North	9	9.89
	Igembe South	7	7.69
	Tigania East	10	10.99
	Tigania West	11	12.09
	Tigania Central	9	9.89
	Imenti North	8	8.79
	Imenti Central	12	13.19
	Imenti South	13	14.29
Years in Dairy Farming	1 – 5 years	14	15.38
	6 – 10 years	24	26.37
	11 – 15 years	21	23.08
	16 – 20 years	18	19.78
	21 – 25 years	8	8.79
	26 years and above	6	6.59
Level of Education	Primary	13	14.29
	Secondary	33	36.26
	Tertiary	31	34.07
	University	14	15.38

Source: Field Data, 2025

The socio-demographic analysis of the respondents offers crucial insights into the composition of dairy farmers in Meru County. The data indicates a higher participation rate of male respondents (60.44%) compared to females (39.56%), suggesting that dairy farming may be a male-dominated activity in the region. This aligns with findings by Kimathi and Mutua (2021), who highlighted that although women are active in

agriculture, men predominantly manage the more commercial aspects such as dairy production.

Regarding the geographical distribution, the majority of respondents came from Imenti South (14.29%) and Imenti Central (13.19%). This may imply that these sub-counties have a stronger dairy farming presence or more effective ASDSP engagement. Interestingly, there was a relatively balanced representation across all sub-counties, demonstrating the comprehensiveness of the sampling strategy and enhancing the reliability of the findings across Meru County.

The distribution of respondents by years of experience in dairy farming reveals that a significant portion (26.37%) had been in the practice for 6–10 years. This mid-level experience group is crucial because it combines practical field exposure with a capacity to adopt modern farming techniques. Farmers with 11–15 years of experience comprised 23.08%, while those with over 20 years accounted for a smaller share. This suggests a fairly youthful and dynamic farming population that could be more responsive to interventions like ASDSP.

In terms of education, most respondents had attained either secondary (36.26%) or tertiary (34.07%) education. Only 14.29% had only primary education, while a minority (15.38%) had university qualifications. The implication of this is that a significant portion of dairy farmers have attained a level of education sufficient to understand and apply the knowledge gained from capacity-building programmes, such as those provided by ASDSP. According to Kibaara and Kavoi (2020), farmers with at least secondary education are more likely to adopt innovative farming technologies and management practices.

Overall, these demographic patterns suggest a promising profile of dairy farmers who are capable, experienced, and strategically located. These characteristics are essential in

understanding how ASDSP financing influences productivity, as the effectiveness of programme interventions is closely linked to the farmers' demographics, including their education, experience, and gender roles in agriculture.

4.4 Effect of Capacity Building on Dairy Farmers' Productivity

Table 5: Descriptive Statistics on Capacity Building and Productivity

Statement	SD	D	N	A	SA	Mean	Std. Dev
Training done regularly on dairy farming improves dairy farmers' productivity	2	4	10	43	32	4.09	0.88
Modernization of dairy processes increases the productivity of dairy farmers	1	3	9	45	33	4.17	0.81
Networking with other dairy farmers for exposure has helped increase the productivity	3	5	12	42	29	3.96	0.94
Majority of dairy farmers have adopted technology to increase their productivity	4	7	13	39	28	3.83	1.04
ASDSP financing has enhanced my capacity as a dairy farmer to increase my productivity	2	4	8	46	31	4.10	0.86
Dairy management skills positively influence productivity	1	2	6	47	35	4.24	0.74

Source: Field Data, 2025

The findings in Table 5 illustrate a detailed account of respondents' perceptions of the effect of capacity building on dairy farmers' productivity in Meru County. The statements evaluated received varying responses, but a general trend toward agreement was observable across all items. Each item was rated on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with the analysis presenting response frequencies, means, and standard deviations.

The first statement, “Training done regularly on dairy farming improves dairy farmers’ productivity,” had the highest number of agreements with 43 respondents agreeing and 32 strongly agreeing. The mean score of 4.09 and a standard deviation of 0.88 indicate a strong consensus among participants that training plays a critical role in improving productivity. The relatively low standard deviation implies homogeneity in responses. Regular training likely equips farmers with knowledge of modern techniques, efficient resource use, and disease management.

The statement “Modernization of dairy processes increases the productivity of dairy farmers” recorded a high mean score of 4.17, with 45 agreeing and 33 strongly agreeing. This is indicative of the positive impact that mechanization and automation have on dairy activities. It is suggestive that interventions such as improved milking systems, cold chain management, and better livestock care facilities have been influential in improving output and efficiency.

When examining networking with other dairy farmers, 42 respondents agreed and 29 strongly agreed that such peer exposure contributed positively to productivity. The mean score of 3.96, while slightly lower, still affirms the role of peer learning and benchmarking. Networking facilitates the exchange of successful practices and encourages collaborative problem-solving. However, the relatively higher standard deviation of 0.94 reflects a moderate degree of variability in how respondents valued networking.

The assertion that “the majority of dairy farmers have adopted technology to increase their productivity” had a slightly lower mean score of 3.83 and the highest standard deviation of 1.04. This suggests that while many farmers acknowledge the benefits of technology, adoption rates and familiarity with digital or mechanical tools vary. Factors

such as age, education level, or financial capacity may influence the adoption of technologies such as digital livestock records or automated feeding systems.

The perception of ASDSP financing's impact on building the capacity of dairy farmers garnered positive feedback, with 46 respondents agreeing and 31 strongly agreeing. The resulting mean of 4.10 underscores the program's effectiveness in supporting capacity development initiatives. This aligns with the intended function of ASDSP to bolster institutional and individual capabilities in the agricultural sector. The funding could be facilitating access to training, demonstration farms, and learning materials.

Lastly, the statement "Dairy management skills positively influence productivity" yielded the highest mean of 4.24 and the lowest standard deviation of 0.74. This confirms the centrality of technical competence in areas such as feeding regimes, breeding practices, and animal health management. A well-managed dairy farm is more likely to achieve optimal milk yield, better animal welfare, and economic viability.

From these results, it is clear that capacity-building efforts – ranging from training and modernization to peer networking and management skills – have a substantial and positive impact on dairy productivity. These elements reflect the holistic approach required to improve the agricultural value chain. Moreover, ASDSP financing appears to have effectively supported these areas, validating the program's strategic implementation.

An interesting insight from the findings is the strong correlation between structured learning (e.g., training and formal management skills) and increased productivity, compared to informal mechanisms such as peer networking. Additionally, while modernization receives favorable ratings, its slightly higher standard deviation suggests room for enhanced outreach and technology dissemination.

Furthermore, the disparities in standard deviation across the items highlight the need for tailored interventions. For example, low adoption of technology may require targeted training for specific demographics, possibly older or less literate farmers. The program might also consider increasing access to technology through subsidies or public-private partnerships.

The results affirm that capacity building is pivotal in enhancing dairy productivity in Meru County. The mean scores above 4.00 for most items demonstrate a high level of appreciation among the respondents, while variations in standard deviation indicate areas where improvements or focused interventions are needed. Capacity building, when supported by structured programs like ASDSP, fosters technical competence, confidence, and resourcefulness among farmers, leading to measurable improvements in output.

4.5 Effect of Subsidies on Productivity

Table 6: Descriptive Statistics on the Effect of Subsidies on Productivity of Dairy Farmers

Statement	SD	D	N	A	SA	Mean	Std. Dev
I have received government subsidies regularly for dairy production.	5	7	10	44	25	3.79	1.02
Subsidies have significantly reduced the cost of dairy inputs.	3	6	9	49	24	3.91	0.95
Subsidies have enabled me to increase my herd size.	8	11	14	36	22	3.58	1.18
I have invested in better feeding practices due to subsidies.	4	6	15	38	28	3.90	1.03
I believe subsidies have led to an increase in milk yield per cow.	6	8	10	39	28	3.85	1.10
The process of accessing subsidies is straightforward and efficient.	10	13	19	29	20	3.34	1.27

Source: Field Data, 2025

The results displayed in Table 6 present insights into how subsidies influence dairy productivity among farmers supported by the Agricultural Sector Development Support

Programme (ASDSP) in Meru County. The first statement examined whether farmers regularly receive government subsidies for dairy production. A majority of respondents (75.8%) agreed or strongly agreed, yielding a mean score of 3.79 and a standard deviation of 1.02. This indicates a general consensus that subsidies are accessible, albeit not uniformly so, as indicated by the standard deviation slightly above 1.

Regarding the effect of subsidies on reducing the cost of dairy inputs, 80.2% of the respondents agreed or strongly agreed. This statement had a mean of 3.91 and a relatively low standard deviation (0.95), suggesting high agreement among participants. This demonstrates that subsidized access to inputs such as animal feed, veterinary services, and breeding stock has effectively lowered operational costs, allowing farmers to allocate resources more efficiently.

On whether subsidies enabled an increase in herd size, a slightly mixed view emerges. While 63.7% of respondents agreed or strongly agreed, a notable proportion (20.9%) disagreed or strongly disagreed. The mean score was 3.58, and the standard deviation was 1.18, reflecting some level of disagreement. This variation can be attributed to the different farm sizes and management capacities, which may limit expansion even when financial aid is available.

In terms of investments in improved feeding practices, 72.5% of respondents confirmed this was enabled by subsidies. The mean response was 3.90, supported by a standard deviation of 1.03. This suggests that subsidies positively influence not just the quantity but also the quality of dairy production, as better feeding practices are directly linked to higher productivity and animal health.

The question of whether subsidies have led to an increase in milk yield yielded a mean of 3.85, with 73.6% of farmers affirming this outcome. The standard deviation (1.10) shows moderate variation, possibly stemming from factors such as breed type,

management skills, and other environmental factors influencing milk output despite access to subsidies.

However, the process of accessing subsidies was perceived less favorably. This statement recorded the lowest mean (3.34) and the highest standard deviation (1.27), with only 53.8% expressing satisfaction. The relatively high disagreement (25.3%) signals the existence of systemic inefficiencies, such as bureaucracy, lack of transparency, or delays, that hinder optimal utilization of these funds.

Overall, the results show a generally positive impact of subsidies on dairy productivity. Most indicators recorded mean values approaching or exceeding 3.8 on a 5-point Likert scale, suggesting strong agreement among respondents. Additionally, lower standard deviations in key productivity indicators imply a consistent impact across the sampled population. Nonetheless, challenges related to the accessibility and administration of subsidies require attention to ensure equitable distribution and full realization of the programme's objectives.

These findings underscore the importance of subsidy schemes in enhancing smallholder dairy farming. They help farmers manage input costs, improve practices, and increase output. However, the mixed perceptions regarding herd expansion and accessibility reflect deeper structural and administrative challenges that need to be addressed to optimize the programme's efficiency and impact.

4.6 Effect of Marketing Strategies on the Productivity of Dairy Farmers

Table 7: Marketing Strategies and Dairy Farmer Productivity

Statement	SA	A	N	D	SD	Mean	Std Dev
The program has helped create new marketing channels for our dairy products	30	38	11	7	5	3.88	1.07
We receive timely market information from ASDSP structures	24	35	15	10	7	3.67	1.16
ASDSP has facilitated linkages with reliable milk buyers	27	41	10	8	5	3.86	1.03
Training on milk value addition has improved our market competitiveness	33	36	9	7	6	3.91	1.11
Farmers have been trained on pricing strategies and profit margins	26	39	13	9	4	3.84	1.05
Participation in marketing cooperatives has increased	28	37	12	9	5	3.83	1.08

Source: Field Data, 2025

The analysis of the findings on the effect of marketing strategies employed through the Agricultural Sector Development Support Programme (ASDSP) reveals significant insights into how these strategies influence the productivity of dairy farmers in Meru County. A total of 91 respondents provided data on various indicators related to market access, pricing, buyer linkages, cooperatives, and capacity building in value addition.

The highest rated statement was “Training on milk value addition has improved our market competitiveness,” which had a mean of 3.91 and a standard deviation of 1.11. This indicates a strong agreement among respondents that capacity-building initiatives on value addition under ASDSP have contributed to enhancing their competitive edge in dairy markets. Value addition not only extends shelf life but also enables farmers to target niche and premium markets (Muriuki et al., 2022). By transforming raw milk into

products like yogurt, cheese, and ghee, farmers diversify their revenue streams and stabilize income.

Another prominent indicator is the establishment of linkages with reliable milk buyers, which received a mean of 3.86. Most respondents agreed that ASDSP has played a vital role in connecting them with dependable market actors. Such buyer-seller relationships contribute to sustained market access and assurance in sales. This finding is consistent with that of Kariuki and Wambugu (2021), who indicated that supply chain interventions that ensure reliable off-takers enhance production planning and reduce post-harvest losses. Moreover, farmers are more willing to invest in productivity-enhancing inputs when they are assured of ready markets.

The statement "The program has helped create new marketing channels for our dairy products" recorded a mean of 3.88, further emphasizing the positive contribution of ASDSP in market diversification. Through the programme, farmers have been exposed to new marketing channels such as direct-to-consumer sales, digital marketing platforms, and formal cooperatives. These channels offer better pricing, reduce dependency on middlemen, and ensure farmers receive a greater share of the final consumer price. Digital platforms, in particular, have emerged as innovative tools for accessing wider markets and collecting real-time market intelligence (Njuguna & Ouma, 2023).

In the realm of market intelligence, the statement "We receive timely market information from ASDSP structures" had a slightly lower mean of 3.67, though still indicating a general agreement. While this is encouraging, it also highlights a potential area for improvement. Timely access to accurate market information—such as prevailing milk prices, buyer availability, and consumer demand—enables farmers to make strategic decisions on when and where to sell. Gichuki and Mwaura (2021) noted that market asymmetries often lead to exploitation of farmers by middlemen. Therefore, continuous

strengthening of ASDSP's information dissemination systems could enhance farmers' market power.

Training on pricing strategies and profit margins also received considerable support, with a mean score of 3.84. The ability to understand cost structures and calculate profit margins is essential for sustainable agribusiness. These trainings have equipped farmers with the knowledge to price their products competitively while ensuring profitability. This aspect is vital in the dairy value chain where cost fluctuation in feed, veterinary services, and transportation can significantly affect the bottom line. According to Njeru and Mwangi (2020), improved financial literacy and business planning are positively associated with increased farm productivity.

Finally, the statement regarding participation in marketing cooperatives scored a mean of 3.83. Dairy cooperatives have long been central to marketing dairy products in Kenya, serving as aggregators that facilitate economies of scale, collective bargaining, and improved service delivery. Through ASDSP, cooperative participation has increased, empowering farmers to achieve better market access, negotiate for higher prices, and access inputs on credit. Cooperative-based models have shown positive impacts in enhancing collective efficiency and productivity in the Kenyan dairy sector (Karanja & Ndungu, 2022).

The standard deviation values across all statements range between 1.03 and 1.16, suggesting a moderate level of consensus among respondents. While a majority lean toward agreement, the presence of neutral and disagreeing responses indicates that not all farmers may have equally benefited or experienced these marketing interventions. Differences could stem from location disparities, program intensity, literacy levels, or farmer engagement levels.

The data suggest that ASDSP has significantly contributed to enhancing marketing strategies for dairy farmers in Meru County. These interventions ranging from training and market linkage facilitation to cooperative promotion have collectively contributed to improved access to markets, better pricing, and enhanced profitability. Nonetheless, areas such as market information dissemination and equitable reach of interventions require further strengthening to ensure uniform benefits across all dairy farmers.

4.7 Effect of Production Resources on Productivity of Dairy Farmers

Table 8: Effect of Production Resources on Productivity of Dairy Farmers

Statement	SA	A	N	D	SD	Mean	Std. Dev
The availability of modern dairy equipment has improved my productivity.	36	42	6	5	2	4.14	0.88
Access to quality livestock breeds has enhanced milk yield.	40	38	7	4	2	4.21	0.84
Proper storage facilities reduce post-harvest losses.	35	39	9	5	3	4.08	0.93
Adequate water supply systems support animal health and output.	38	40	5	5	3	4.16	0.90
Access to veterinary services improves overall dairy productivity.	39	41	6	3	2	4.23	0.82

Source: Field Data, 2025

The study sought to establish the influence of production resources on the productivity of dairy farmers in Meru County under the Agricultural Sector Development Support Programme (ASDSP). The responses indicate that access to production resources is a key determinant of productivity levels among the farmers surveyed.

The first item assessed the impact of modern dairy equipment on productivity. A majority of the respondents agreed (42) or strongly agreed (36) that such equipment significantly

enhances productivity, with a high mean of 4.14 and a standard deviation of 0.88. This suggests a strong consensus on the positive role played by mechanized milking machines, cooling systems, and feed mixers in reducing manual labor, minimizing losses, and improving milk handling efficiency. The relatively low standard deviation implies minimal variability in the responses, indicating a uniform experience among farmers regarding the benefits of such equipment.

On the availability of quality livestock breeds, 40 respondents strongly agreed and 38 agreed, while only 4 disagreed and 2 strongly disagreed. The mean was 4.21 with a standard deviation of 0.84. This highlights a widely held view that improved breeds, particularly those selected for high milk yield and disease resistance, are crucial to enhancing output. The results imply that breed selection programs under ASDSP have been effective in facilitating access to high-performing livestock, thus contributing positively to farm productivity.

Regarding storage facilities, 35 respondents strongly agreed and 39 agreed that proper storage infrastructure helps in reducing post-harvest losses. The mean response was 4.08 and the standard deviation was 0.93. While this item had slightly more variability, the high average response score underscores the perceived importance of storage in maintaining milk quality and minimizing spoilage. It also reflects a growing recognition among dairy farmers that storage innovations, such as milk coolers and collection centers, are instrumental in prolonging shelf life and maintaining hygiene standards.

The adequacy of water supply systems also received favorable responses. A combined 78 respondents agreed or strongly agreed that sufficient and reliable water supports animal health and enhances productivity, with a mean of 4.16 and standard deviation of 0.90. Clean and adequate water is essential for lactating cows, influencing not only milk quantity but also animal well-being. The findings suggest that investments in water

harvesting and supply infrastructure—such as boreholes, piping systems, and troughs—have had a measurable impact on dairy performance in Meru County.

Lastly, the item concerning access to veterinary services was rated highly, with 39 respondents strongly agreeing and 41 agreeing. The mean of 4.23 and the lowest standard deviation of 0.82 among the listed items indicate a strong, consistent belief that veterinary care significantly improves dairy productivity. Preventive and curative animal health services are critical in minimizing disease outbreaks, maintaining milk safety standards, and enhancing reproductive efficiency. These findings resonate with the goals of ASDSP in strengthening animal health systems to increase dairy profitability.

Overall, the analysis confirms that production resources—ranging from infrastructure to animal health services—substantially contribute to enhanced dairy productivity. The high mean scores across all five items indicate general satisfaction among respondents regarding the availability and utility of these resources under ASDSP. Moreover, the relatively low standard deviations reveal a shared experience, suggesting that interventions have reached a broad segment of dairy farmers in Meru County. These findings reflect a well-implemented support program that targets key production factors known to influence output and efficiency in dairy farming.

4.8 Inferential Analysis

This section presents the inferential statistical analysis used to test the relationships between the independent variables (capacity building, subsidies, marketing strategies, and production resources) and the dependent variable (productivity of dairy farmers). The analysis included correlation, regression, and ANOVA tests.

4.8.1 Model Summary

Table 9: Model Summary

Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*
1	0.825	0.680	0.667	0.421

The model summary shows a multiple correlation coefficient (R) of 0.825, indicating a strong positive relationship between the independent variables and the dependent variable. The R Square value of 0.680 implies that approximately 68.0% of the variation in dairy farmer productivity is explained by the combination of capacity building, subsidies, marketing strategies, and production resources. The Adjusted R Square (0.667) accounts for the number of predictors and confirms the model's strong explanatory power.

4.8.2 Regression Analysis

Table 10: Regression Coefficients

Variable	**Unstandardized B**	**Std. Error**	**Beta**	**t**	**Sig. (p-value)**
(Constant)	0.442	0.194	—	2.278	0.025
Capacity Building	0.274	0.076	0.319	3.605	0.001
Subsidies	0.223	0.063	0.284	3.540	0.001
Marketing Strategies	0.201	0.068	0.247	2.956	0.004
Production Resources	0.256	0.071	0.295	3.606	0.001

The regression coefficients reveal that all four predictors had a statistically significant positive influence on the productivity of dairy farmers ($p < 0.05$). Among them, capacity building ($\beta = 0.319$) and production resources ($\beta = 0.295$) exhibited the strongest standardized effects, indicating that these two variables are the most influential factors in enhancing productivity.

The constant value (0.442) suggests that even in the absence of the identified predictors, there is a baseline productivity level among dairy farmers.

4.8.3 Correlation Analysis

Table 11: Pearson Correlation Coefficients

Variables	Productivity	Capacity Building	Subsidies	Marketing Strategies	Production Resources
Productivity	1.000	0.715**	0.683**	0.648**	0.698**
Capacity Building	0.715**	1.000	0.577**	0.526**	0.590**
Subsidies	0.683**	0.577**	1.000	0.542**	0.569**
Marketing Strategies	0.648**	0.526**	0.542**	1.000	0.503**
Production Resources	0.698**	0.590**	0.569**	0.503**	1.000

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

The correlation matrix demonstrates that all independent variables had strong and statistically significant positive relationships with the dependent variable. The highest correlation was between capacity building and productivity (r = 0.715), followed closely by production resources (r = 0.698), implying that these components of ASDSP are particularly effective in enhancing productivity.

4.8.4 ANOVA

Table 12: ANOVA (Analysis of Variance)

Model	Sum of Squares	df	Mean Square	F	Sig. (p-value)
Regression	41.230	4	10.308	58.199	0.000
Residual	19.420	86	0.226		
Total	**60.650**	**90**			

The ANOVA results indicate that the overall regression model is statistically significant ($F = 58.199$, $p < 0.001$). This means that the combined predictors (capacity building,

subsidies, marketing strategies, and production resources) significantly explain the variance in dairy farmer productivity. The high F-value further supports the strength of the model.

The inferential analysis affirms that the Agricultural Sector Development Support Programme (ASDSP) has had a statistically significant impact on the productivity of dairy farmers in Meru County. The high R Square (0.680) and significant F-statistic from the ANOVA underscore that the set of independent variables collectively explain a large portion of the variance in productivity. The standardized regression coefficients point to capacity building and production resources as the most impactful predictors, consistent with earlier findings in the descriptive analyses.

The significant correlations also confirm that each component of the ASDSP is positively associated with productivity. This is aligned with the theoretical underpinnings of the study, particularly the Resource-Based View (RBV), which posits that access to and effective utilization of resources (human, financial, physical) are central to performance. Similarly, the Technology Acceptance Model (TAM) supports the observed importance of production infrastructure and strategic marketing, which are enablers of improved productivity.

From a policy and practice perspective, these findings highlight the importance of sustained investment in farmer training, infrastructure, financial inputs (subsidies), and market linkages. Program administrators and government agencies can use these insights to refine interventions, ensuring that the most impactful components receive prioritization in terms of funding and logistical support.

Moreover, the relatively low standard error in the model suggests reliability in prediction, increasing the confidence with which recommendations can be made. The implications

are that scaling similar interventions across other counties with comparable agro-ecological and socio-economic conditions could yield equivalent productivity gains.

4.9 Discussion of Findings

4.9.1 Socio-Demographic Characteristics

The socio-demographic characteristics observed in this study support and sometimes challenge the assumptions held by previous researchers about rural farming communities in Kenya. First, the predominance of male respondents reflects findings by Muriuki and Ngigi (2022), who argued that gender roles in rural Kenya often designate men as land and livestock owners. However, the substantial involvement of women (39.56%) in dairy farming points toward growing inclusivity, especially in family-managed enterprises, consistent with emerging gender mainstreaming in agricultural projects (FAO, 2021).

The experience levels in dairy farming, primarily concentrated between 6–15 years, indicate a relatively seasoned farmer population. This group likely forms the main target for government and donor-led interventions such as ASDSP. It contrasts with Oloo (2020), who found that many farmers in Western Kenya had less than five years of experience due to high attrition in livestock farming. The higher retention in Meru County could be a result of better policy implementation or more favorable climatic and economic conditions.

Educational attainment was notably high, with more than 85% of respondents having secondary education or above. This aligns with assertions by Chege and Wanyama (2021), who noted that education significantly enhances farmers' capacity to benefit from formal training and adopt digital agricultural tools. This educated farmer base increases the potential success of ASDSP interventions that rely on farmer literacy and comprehension of technical content.

Regarding geographical representation, the balanced distribution of respondents from across the nine sub-counties adds depth and generalizability to the findings. Sub-counties like Imenti South and Imenti Central reported the highest respondent frequencies. This could suggest better ASDSP outreach or existing dairy production hubs in these areas. Such findings support regional reports by the Ministry of Agriculture (2023), which identify these sub-counties as priority dairy zones under county development plans.

In summary, the socio-demographic characteristics of the respondents do not only provide a backdrop for interpreting the study's findings but also validate the relevance and potential impact of ASDSP financing. The educational level, experience in farming, and gender distribution indicate that Meru's dairy farming community is adequately prepared to benefit from agricultural development programmes. Where disparities exist, such as in gender or access in less-represented sub-counties, policy adjustments may be necessary to ensure equitable programme impacts. These findings reinforce the importance of tailoring interventions to specific demographic realities to maximize effectiveness (World Bank, 2020).

4.9.2 Effect of Capacity Building on Dairy Farmers' Productivity

The results obtained from the analysis of objective one are in agreement with a significant body of contemporary literature affirming the positive impact of capacity building on agricultural productivity. Numerous studies underscore the fact that training, modernization, networking, and management skills development are integral components of agricultural transformation, particularly in the dairy sub-sector.

For instance, a study by Onyango and Wambugu (2022) reported that consistent training enhances the technical competence of dairy farmers in Kenya, leading to better animal husbandry practices, reduced calf mortality, and improved milk quality. These findings are congruent with the present study, where the statement regarding regular training

yielded a high mean of 4.09. The alignment emphasizes the universal recognition of farmer education as a productivity enhancer.

Similarly, the high score attributed to the modernization of dairy processes aligns with findings by Njenga et al. (2021), who found that access to modern dairy equipment, such as milking machines and milk coolers, significantly reduces labor input while maintaining hygienic standards that enhance product quality. The study participants also highly agreed that modernization boosts productivity, further reinforcing the argument that mechanization is a key driver of improved outcomes in dairy farming.

Regarding peer networking, the current study found a mean of 3.96. While positive, this is slightly lower than other aspects such as training and modernization. This finding is consistent with research by Kimani and Mwaura (2020), who noted that while peer interaction fosters knowledge sharing, its impact on productivity is more indirect and heavily influenced by the structure and frequency of such interactions. It suggests that more structured farmer field schools or cooperatives may improve the efficiency of this knowledge-sharing method.

Technology adoption, although acknowledged as beneficial, exhibited the highest variation in responses. This echoes the conclusions of Koech and Ouma (2023), who noted that while digital innovations such as dairy management software and online veterinary consultations are promising, uptake remains low due to digital illiteracy and infrastructural limitations in rural areas. The findings of this study mirror such barriers and suggest the need for capacity-building programs to incorporate digital literacy training as part of the curriculum.

ASDSP financing was acknowledged as a contributor to enhanced capacity, which is consistent with the goals of the program. According to the Ministry of Agriculture's 2023 annual report, ASDSP Phase II prioritized training, innovation platforms, and capacity

building as core pillars in improving productivity. The high level of agreement in this study (mean = 4.10) demonstrates that these priorities are not only well received but are also translating into visible results on the ground.

Interestingly, the highest mean score in this section was observed in relation to dairy management skills, aligning with findings by Mutuku and Irungu (2021), who identified management efficiency as the single most influential factor in determining dairy farm profitability. This encompasses feed formulation, disease control, and reproductive planning all critical in maximizing outputs per animal unit.

Conversely, this study does not entirely agree with literature that downplays capacity building in favor of infrastructural and financial support. While these elements are indeed important, as seen in other objectives, the current findings underscore the fundamental role of knowledge and skill transfer. This validates the Human Capital Theory, which posits that investment in knowledge and capabilities yields higher productivity returns (Becker, 1993, as cited in Oduor & Wanyoike, 2022).

Furthermore, while the study supports the Resource Dependency Theory's emphasis on external support systems, it adds nuance by showing that such support (in this case, ASDSP financing) is most effective when channeled toward capacity enhancement rather than handouts or unsustainable subsidies. Thus, the study recommends a strategic realignment where funding prioritizes skill development.

This section substantiates that capacity building is a central pillar in dairy productivity. The results affirm theoretical and empirical positions that advocate for the integration of education, modernization, peer exchange, and financial facilitation to maximize farmer output. While this study finds overwhelming agreement with recent literature, it also reveals gaps in implementation, especially regarding technology adoption and inclusive access to training. Therefore, policy recommendations should aim to expand training

coverage, simplify technological tools, and reinforce ASDSP's role in facilitating continuous professional development for farmers.

4.9.3 Effect of Subsidies on Productivity

The findings from this study resonate with recent empirical literature emphasizing the critical role that subsidies play in enhancing the productivity of dairy farmers. Scholars such as Atieno and Maina (2021) argue that government subsidies reduce the cost burden on smallholder farmers, enabling them to invest in productivity-enhancing practices. This is in agreement with the majority of respondents in this study who affirmed that subsidies reduced input costs and supported better feeding practices.

Moreover, the study's finding that subsidies led to increased milk yields aligns with the results reported by Omondi and Waweru (2022), who found a statistically significant increase in average milk production among farmers receiving feed and veterinary subsidies. Their work supports the view that targeted subsidies, particularly when aligned with extension services, can lead to tangible productivity gains.

However, the relatively lower agreement on whether subsidies have led to herd expansion introduces a point of divergence from certain studies. For example, Chege and Ndungu (2020) emphasized that access to consistent financial support through subsidies enhances livestock assets among rural farmers. The difference could be attributed to localized challenges in Meru County, such as limited grazing land or high operational costs that inhibit herd expansion despite the availability of subsidies. This indicates that while subsidies may provide the financial capability to expand, other contextual factors influence actual outcomes.

The result showing that most farmers experienced an improvement in feeding practices due to subsidies also finds support in studies such as Nyambura and Kimathi (2023), who documented that farmers receiving feed supplements from subsidy programs reported

better cow health and milk production. Such findings suggest that productivity improvements are not solely dependent on the number of animals owned but also on the quality of inputs and management practices adopted as a result of financial support.

A key point of concern arising from the current study relates to the difficulty experienced in accessing subsidies. This was the item with the lowest mean and highest standard deviation, revealing a lack of consensus among respondents. A comparable observation was made by Kiptanui and Bett (2021), who observed that delays in disbursement and lack of clear eligibility criteria often frustrate farmers, leading to underutilization of available funds. These administrative bottlenecks not only reduce the effectiveness of the subsidy programs but also erode trust in public agricultural support systems.

On the policy front, this study's findings reinforce calls for streamlined and transparent mechanisms for subsidy distribution. Research by Wanjiru and Barasa (2024) advocates for the adoption of digital platforms to manage agricultural subsidies, thereby reducing corruption and inefficiencies. Implementing such systems in Meru County could enhance the accessibility and reliability of subsidy schemes, ensuring that resources reach the intended beneficiaries efficiently.

Furthermore, while the positive responses regarding milk yield and improved practices are encouraging, it is crucial to complement subsidies with continuous training and monitoring. The Resource-Based View (RBV) theory, which frames this study, posits that sustained competitive advantage arises from effective resource deployment. Thus, without adequate training and follow-up, the gains from subsidies may be short-lived.

The study affirms the general effectiveness of subsidy programs in enhancing dairy productivity. The alignment with most recent literature indicates that the ASDSP's financial support mechanisms are yielding the intended outcomes. However, the challenges related to subsidy access must be urgently addressed to maximize impact.

Policymakers should consider refining eligibility criteria, decentralizing distribution systems, and integrating digital tools for monitoring and evaluation. By doing so, they can build a more resilient, equitable, and productive dairy sector in Meru County.

4.9.4 Effect of Marketing Strategies on the Productivity of Dairy Farmers

The discussion of these findings reveals alignment and divergence with scholarly perspectives and empirical evidence on the role of marketing strategies in agricultural productivity, especially in the dairy sector.

First, the observation that value addition has significantly improved farmers' market competitiveness aligns well with the findings of Makori and Otieno (2021), who identified value addition as a key driver for income diversification and market expansion in the Kenyan dairy industry. Through ASDSP training, dairy farmers have not only improved milk quality but also ventured into processing, thus capturing a larger portion of the value chain. This agrees with international literature that recommends value addition as a strategy for resilience and profitability among smallholder farmers (FAO, 2022).

Moreover, the creation of new marketing channels through ASDSP reflects broader trends in agricultural transformation, where traditional markets are being complemented by digital platforms and formal institutional linkages. This is in agreement with Gakuru and Mutua (2023), who argue that digital transformation in rural agriculture has redefined market participation, especially among youth and tech-savvy farmers. However, there is a gap in digital literacy and infrastructure that still limits the full exploitation of these channels. Thus, while the findings are optimistic, they call for investment in digital inclusion and ICT infrastructure in rural Meru.

Regarding market linkages with reliable buyers, the study concurs with the works of Ochieng et al. (2022), who emphasized the importance of stable buyer relationships in

building market confidence among producers. In volatile markets, such as dairy, price fluctuations and delayed payments can discourage production. Programs like ASDSP that enhance formal buyer agreements, contracts, and traceability mechanisms foster a sense of security among farmers. However, Gichure and Kamau (2021) noted that such arrangements are only sustainable when backed by strong legal and institutional frameworks, which may still be underdeveloped in many counties.

The study also identified that training on pricing strategies and profit margins had a positive effect. This supports the assertions by Wanjiru and Karani (2020), who found that financial literacy programs tailored for farmers lead to more informed production and marketing decisions. The ability to analyze input costs and set realistic prices is essential in an environment of unpredictable feed prices and changing consumer demand. However, it was also found that such training needs periodic reinforcement to maintain relevance and effectiveness. Furthermore, training alone may not suffice unless coupled with access to affordable credit and insurance services, as observed by Nyambura and Kiarie (2021).

The finding on cooperative participation also corresponds with the long-standing understanding that farmer-based organizations serve as essential platforms for collective action. This is supported by a study conducted by Mureithi and Wambua (2022), which showed that farmers engaged in active cooperatives reported higher productivity levels due to better access to extension services, inputs, and credit. However, cooperatives also face internal governance challenges, such as elite capture and financial mismanagement, which may deter active participation. Therefore, continuous capacity building for cooperative leadership is essential to sustain their functionality.

One area where the findings show partial disagreement with existing literature is on the effectiveness of market information systems. While the study found general agreement

that ASDSP provides market information, the relatively lower mean indicates possible inconsistencies or delays in the flow of this information. This contrasts with the ideal model proposed by Obiero and Achieng (2020), which posits that real-time market information significantly improves farmer negotiation power. The implication is that while ASDSP has made strides, more robust information systems—possibly using mobile-based platforms—are necessary for optimal market participation.

Furthermore, despite the positive ratings, the standard deviations indicate varying experiences among farmers. This reflects a structural inequality in program outreach and benefits distribution, a finding echoed by Wafula and Musyoka (2023), who criticized the "one-size-fits-all" approach in many agricultural programs. To achieve inclusive development, ASDSP must tailor its interventions to meet the specific needs of different farmer segments based on gender, location, farm size, and resource access.

The discussion affirms that marketing strategies under ASDSP have played a transformative role in enhancing dairy productivity in Meru County. They have addressed structural bottlenecks in market access, pricing, and value addition, in alignment with national agricultural transformation agendas. However, sustainable impacts require continuous investment in capacity building, infrastructure, digital inclusion, and institutional governance to ensure the gains are equitably distributed and long-lasting.

4.9.5 Effect of Production Resources on Productivity of Dairy Farmers

The findings align well with prior empirical and theoretical literature that emphasizes the role of production resources in improving agricultural productivity. From a theoretical standpoint, the Resource-Based View (RBV) holds that sustainable competitive advantage in organizations—and by extension in smallholder farms—results from the acquisition and effective utilization of valuable, rare, and inimitable resources (Barney, 1991; Wernerfelt, 1984). In the context of dairy farming, such resources include high-

yielding breeds, modern equipment, adequate water, quality storage, and veterinary services.

The agreement among respondents concerning the contribution of modern dairy equipment to productivity supports existing studies. According to Ndungu et al. (2021), mechanized milking and milk preservation techniques significantly enhance production efficiency by reducing labor costs and minimizing post-harvest losses. The findings in Meru County are consistent with these assertions, indicating that ASDSP investments in dairy mechanization are bearing fruit. This also aligns with the broader national agenda of mechanizing agriculture to enhance productivity (Ministry of Agriculture, 2020).

Access to improved livestock breeds is widely acknowledged as a game changer in dairy farming. The high mean response for this variable corroborates the findings of Kimathi et al. (2020), who argue that breed improvement programs under ASDSP have enhanced milk production per cow by up to 40%. These improved breeds, often sourced through Artificial Insemination (AI) services, possess superior genetics that translate into better yields, disease resistance, and faster maturity. The current findings suggest that farmers in Meru have benefited substantially from such initiatives.

Regarding storage, respondents affirmed its importance, aligning with the study by Mukiri and Mugambi (2022), who found that the introduction of community-based milk cooling centers in Embu and Meru counties significantly reduced milk spoilage. This ensures that dairy farmers can store milk safely during peak production and negotiate better market prices. Thus, the findings underscore the contribution of storage infrastructure not only to productivity but also to income stabilization.

The role of water in dairy farming cannot be overstated. The study by Gikunda et al. (2021) indicated that inadequate water supply correlates with reduced milk yield and increased disease prevalence. The current study's finding that most respondents affirmed

the importance of adequate water supply systems supports this perspective. Moreover, water supply challenges are exacerbated in arid and semi-arid regions, making infrastructure investments crucial in sustaining dairy productivity.

Veterinary services emerged as the most agreed-upon item. This supports Wanyoike and Karani (2020), who observed that regular veterinary interventions enhance herd health and productivity by reducing mortality and morbidity rates. The availability of veterinary care under ASDSP, whether subsidized or mobile-based, ensures timely diagnosis and treatment, increasing the overall efficiency of dairy enterprises. This aligns with the goal of improving animal health systems for sustainable productivity.

While the findings largely align with the literature, it is also important to note areas of divergence. For instance, while most respondents viewed the resources favorably, a minority expressed disagreement or neutrality. This may reflect uneven distribution of ASDSP benefits, disparities in farmer awareness, or logistical limitations in certain areas. Kimani and Wambugu (2023) note that while national programs often have broad coverage, the depth of implementation can vary significantly at local levels, necessitating more localized monitoring and feedback systems.

In comparing with other regions, the results from Meru are more optimistic than those reported by Chebet et al. (2020) in Uasin Gishu County, where infrastructural limitations and poor coordination hampered the full realization of ASDSP goals. The contrast highlights the importance of context-specific implementation strategies and active stakeholder engagement. Meru's positive results may therefore serve as a benchmark for scaling best practices to other counties.

The findings support the view that production resources enhanced through the ASDSP have a strong and positive effect on dairy productivity. This is consistent with the expectations of both RBV and empirical literature. While some gaps may exist, the

overall direction of influence is affirmative, and the program appears to be achieving its intended objectives in Meru County.

4.10 Qualitative Analysis

The qualitative data in this study were collected through open-ended questions in the questionnaire and follow-up interviews with selected dairy farmers. Thematic analysis was employed to identify emerging patterns, perspectives, and insights regarding how the Agricultural Sector Development Support Programme (ASDSP) financing influences productivity. The analysis focused on four core themes: capacity building, subsidies, marketing strategies, and production resources.

On the theme of capacity building, the majority of farmers expressed that training sessions had significantly improved their knowledge and skills in animal husbandry, disease control, and feed formulation. One respondent stated,

"Before the ASDSP training, I did not know how to balance my cows' diet. Now I know what minerals and supplements are necessary, and I can see a clear improvement in milk yields."

This testimony underscores the significance of technical knowledge as a prerequisite for enhanced productivity. According to Ahmed and Raza (2022), capacity building is instrumental in equipping farmers with the skills required to adopt modern agricultural practices, which translates into improved efficiency and yield. Farmers further emphasized that the training enabled them to recognize early signs of disease in livestock, reducing mortality rates and veterinary costs. This aligns with findings by Kaburu and Kiiru (2021), who documented that technical training significantly reduces the cost of production while increasing livestock productivity in Kenya's rural settings.

Another insight that emerged within the theme of capacity building was the role of continuous mentorship. Several respondents expressed appreciation for the mentorship approach adopted by ASDSP. One farmer noted,

"We were not just trained and left. The officers followed up, visited our farms, and guided us as we implemented what we learnt."

Such support mechanisms create a learning environment conducive to the translation of knowledge into practice. This is consistent with Muthee and Maina (2023), who highlight the importance of post-training mentorship in enhancing the practical application of extension services in livestock farming. Notably, however, a few farmers expressed concerns about the frequency of these training programs, noting that sessions were sometimes delayed or too brief to cover critical content. This feedback suggests the need for sustained and well-scheduled training cycles.

Under the theme of subsidies, many respondents acknowledged that financial support enabled them to access quality animal feeds, veterinary drugs, and breeding services. One respondent remarked,

"I used to feed my cows whatever was cheap. Now, with support from the program, I buy certified dairy meal and vaccines. It makes a big difference."

The importance of input affordability was widely acknowledged, and subsidies appeared to serve as a catalyst for adopting best practices. These sentiments align with the work of Nyang'au and Omiti (2022), who found that subsidies increase farmers' ability to invest in quality inputs, thereby raising productivity levels.

Despite the benefits, some respondents highlighted challenges in accessing these subsidies.

"The paperwork and approval process for getting the subsidy was too long and sometimes discouraging,"

lamented one participant. Bureaucracy and inconsistent disbursement mechanisms were cited as key impediments. This finding resonates with the observations by Chege et al.

(2021), who reported that procedural delays and administrative inefficiencies often dilute the effectiveness of agricultural subsidies in Kenya. Furthermore, respondents advocated for more inclusivity in the allocation of subsidies, particularly for women and youth farmers who often face systemic exclusion. This insight reveals the need for equity considerations in policy implementation.

The theme of marketing strategies generated diverse perspectives. A dominant narrative among participants was that the ASDSP enhanced their access to markets through the formation of cooperatives and digital platforms. One participant noted,

"Before joining the program, I sold milk to neighbors. Now, through our dairy cooperative, we sell to a processor, and I get paid monthly."

The shift from informal to formal markets was perceived as transformative, as it offered price stability, improved bargaining power, and consistent income. This mirrors the findings of Muriuki and Njiru (2020), who documented that structured marketing channels are essential in stabilizing dairy incomes and promoting growth.

Another respondent emphasized the importance of digital marketing platforms introduced by the ASDSP.

"We learned how to use WhatsApp and digital forms to link with buyers and transporters. It's more efficient and saves time,"

they observed. Such insights highlight the digital evolution in agricultural marketing, a phenomenon noted by Mumo and Kilonzo (2023), who argue that mobile technology is increasingly critical in facilitating transparent and efficient agricultural trade in Kenya. Nevertheless, some farmers expressed concerns about the sustainability of these market linkages, particularly when donor funding is withdrawn. Others noted that transport logistics remained a barrier in remote areas despite market access improvements.

The final theme of production resources revealed the transformative role of ASDSP in facilitating access to key infrastructure such as water tanks, milking machines, and storage facilities. A respondent shared,

"With the ASDSP grant, I bought a water tank. My cows are no longer thirsty, and milk production has doubled."

Such remarks underscore the relationship between resource availability and output. The provision of physical infrastructure was also linked to reductions in labor costs and time. Another participant said,

"I used to milk manually and needed two people. With the machine, I do it alone in less time."

These narratives validate the assertion by Wanjala and Kitur (2021), who argue that technology-enhanced production tools significantly reduce labor dependency and improve efficiency.

Despite the gains, concerns emerged regarding the affordability and maintenance of such resources. Some farmers noted that while initial acquisition was subsidized, maintenance costs were borne individually and could be unsustainable.

"The machine is good, but when it broke down, I didn't have money to repair it,"

lamented one respondent. This points to the need for long-term financing models or maintenance support. Furthermore, some participants argued that the selection process for equipment grants was opaque and appeared biased. Transparency and fairness in resource allocation were proposed as necessary improvements.

A cross-cutting theme that surfaced was the role of collaboration and stakeholder engagement. Many respondents credited local partnerships between government agencies, NGOs, and cooperatives as instrumental in the successful delivery of program components.

"The county officers, NGOs, and our local cooperative worked together well. That is why the program succeeded here,"

noted a farmer. This observation aligns with the findings by Otieno and Kirwa (2022), who advocate for multi-stakeholder collaboration in the implementation of agricultural development programs.

In summary, the qualitative data reveal that farmers generally perceive ASDSP financing as impactful across the four dimensions examined. Capacity building enhanced technical knowledge and practices; subsidies increased access to quality inputs; marketing strategies opened up structured and digital markets; and production resources improved operational efficiency. These findings affirm the quantitative results presented in previous sections and deepen our understanding of how and why the program affects productivity. However, the qualitative narratives also highlighted implementation challenges, such as bureaucratic delays, equity concerns, affordability of equipment maintenance, and sustainability of interventions.

Integrating these insights with the Resource-Based View (RBV) theory reinforces the centrality of both tangible and intangible resources such as knowledge, tools, and networks in influencing productivity outcomes. Additionally, the Technology Acceptance Model (TAM) is supported by narratives indicating that technology adoption (e.g., digital marketing platforms and milking machines) was facilitated through exposure and training, thereby increasing acceptance and usage.

The qualitative analysis further validates the necessity for an adaptive, inclusive, and farmer-centered approach to development programming. To maximize effectiveness, there is a need to streamline subsidy delivery, ensure inclusive participation, and provide long-term support mechanisms for resource sustainability. Additionally, strengthening post-training mentorship and reinforcing collaborative frameworks among stakeholders could enhance the durability of the program's benefits. As suggested by Ouma and Mbaka (2023), sustainability in agricultural development hinges not just on initial inputs but on continuous support systems, equity in service provision, and adaptability to local realities.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents a synthesis of the study findings, drawing conclusions based on the key objectives of the research and offering practical recommendations for stakeholders involved in agricultural development and policy implementation. The chapter is organized into five sections: an introductory overview, a detailed summary of findings, conclusions drawn from both quantitative and qualitative data, specific recommendations to enhance the effectiveness of the Agricultural Sector Development Support Programme (ASDSP), and suggested areas for further scholarly inquiry. Each section contributes to highlighting the extent to which ASDSP financing influences the productivity of dairy farmers in Meru County, Kenya.

5.2 Summary of Findings

The overarching objective of this study was to assess the effect of ASDSP financing on the productivity of dairy farmers in Meru County. The study focused on four main dimensions: capacity building, subsidies, marketing strategies, and production resources. Through a mixed-methods approach involving both quantitative data (collected from 91 respondents via structured questionnaires) and qualitative insights (drawn from open-ended responses and interviews), the study provided a comprehensive understanding of how the programme's financial interventions influence dairy farming productivity.

On capacity building, the findings revealed that most respondents agreed that training and extension services under ASDSP significantly improved their knowledge and competencies in dairy management. Descriptive statistics indicated high mean scores across items related to knowledge on animal nutrition, disease management, and modern

dairy practices, with minimal standard deviation, implying a consistent positive perception among farmers. The qualitative analysis further illustrated how this knowledge translated into practical farm improvements such as feed optimization, health care, and milk hygiene practices. The continuous mentorship and follow-up support embedded within the program were instrumental in enabling farmers to apply the acquired skills effectively. These findings underscore the critical role of human capital development in agricultural productivity, as supported by recent studies (Ahmed & Raza, 2022; Muthee & Maina, 2023).

Regarding subsidies, the study found that financial support provided by the programme allowed farmers to purchase high-quality feeds, drugs, and breeding services. Respondents overwhelmingly indicated that these subsidies made essential inputs more affordable, directly influencing milk yields and herd health. However, several farmers also noted inefficiencies in the subsidy disbursement process, including bureaucratic delays and perceptions of exclusion. The qualitative data revealed that while many beneficiaries appreciated the assistance, others remained constrained by access barriers. These findings are in line with Chege et al. (2021), who argue that although subsidies are effective in improving farm inputs, equitable access and timely disbursement are essential for sustained impact.

In relation to marketing strategies, the findings demonstrated that ASDSP interventions had a positive influence on market access and organization. Quantitative responses showed strong agreement with statements related to better market linkages, price stability, and participation in cooperatives. Farmers reported increased income predictability due to formalized contracts with processors and reduced dependency on brokers. The program also promoted the use of digital platforms for marketing, which several participants noted had improved communication and transaction efficiency.

However, concerns were raised about the long-term sustainability of these linkages, especially in remote areas where transport infrastructure remains poor. The findings resonate with Muriuki and Njiru (2020), who found that formal marketing structures significantly stabilize agricultural income but require sustained institutional support.

The final objective concerning production resources revealed that access to physical infrastructure such as water tanks, milking machines, and storage facilities significantly improved efficiency on dairy farms. Quantitative analysis reflected strong mean scores in items addressing equipment use, reduced labor costs, and enhanced hygiene. Farmers confirmed that such investments allowed for time-saving, improved milk handling, and better animal welfare. Nonetheless, qualitative data brought to light concerns over equipment maintenance and cost sustainability after initial program support ends. These findings mirror Wanjala and Kitur (2021), who emphasized the importance of post-investment support and technical servicing in agricultural equipment management.

Across all four objectives, the inferential statistics supported the assertion that ASDSP financing positively influences dairy productivity. The regression and correlation analyses confirmed significant associations between the programme components and productivity indicators such as milk output, income stability, and herd health. Additionally, the ANOVA test validated the explanatory power of the independent variables in relation to the dependent variable. The qualitative findings reinforced these conclusions, offering depth and context to the numerical results through farmer testimonies.

Overall, the study demonstrated that ASDSP financing contributes meaningfully to dairy farming productivity through a multifaceted support approach. However, it also revealed the importance of addressing systemic gaps related to inclusivity, administrative efficiency, equipment sustainability, and infrastructure development. As such, policy

interventions must not only sustain but also enhance these programme elements to ensure equitable, long-term impact.

5.3 Conclusion

This study concludes that the Agricultural Sector Development Support Programme financing plays a pivotal role in enhancing the productivity of dairy farmers in Meru County. Through targeted interventions in capacity building, subsidies, marketing strategies, and production resource provision, the programme has significantly improved the operational and economic outcomes of dairy farming. Farmers who participated in training gained valuable skills that translated into more effective animal management and increased milk yields. Subsidies allowed for greater affordability and accessibility of critical inputs, while marketing interventions opened up structured and reliable channels for dairy sales. Additionally, physical production resources reduced manual labor and facilitated efficient farm operations.

However, the findings also point to persistent challenges that may impede the full realization of the programme's benefits. Issues such as bureaucratic inefficiencies in subsidy disbursement, inequitable access among marginalized groups, sustainability of market linkages, and the maintenance of supplied equipment must be systematically addressed. Furthermore, the variability in implementation effectiveness across different locations suggests the need for adaptive and context-sensitive approaches to programme delivery. The qualitative data underscored the importance of continued mentorship, stakeholder collaboration, and participatory decision-making in ensuring that the programme remains responsive to farmer needs.

In essence, ASDSP financing has demonstrated substantial positive effects, but its long-term success depends on sustained funding, institutional capacity, and deliberate efforts

to overcome operational bottlenecks. By reinforcing areas of strength and addressing areas of concern, the programme can serve as a model for agricultural development and productivity improvement in similar contexts across Kenya and beyond.

5.4 Recommendations

i. **Strengthen Post-Training Mentorship and Monitoring**: The government and implementing partners should institutionalize continuous mentorship and monitoring mechanisms to reinforce the application of skills gained through capacity building. Follow-up visits and refresher training sessions would help farmers internalize and effectively implement knowledge gained.

ii. **Enhance Inclusivity and Streamline Subsidy Disbursement**: To ensure equitable access, the ASDSP should adopt transparent, simplified, and digitalized processes for subsidy applications and disbursements. Special provisions should be made for marginalized groups, including women, youth, and persons with disabilities.

iii. **Establish Equipment Maintenance and Financing Models**: The program should incorporate mechanisms for equipment servicing and spare part availability, such as cooperatives-based repair funds or maintenance subsidies. Additionally, revolving credit facilities could help farmers finance equipment replacement and upgrades.

5.5 Suggestions for Further Research

i. **Impact Assessment of ASDSP on Youth and Women-Led Dairy Enterprises**: Future studies should explore the differentiated impact of ASDSP interventions

on youth and women-led farming ventures to understand how inclusivity can be improved within the programme's framework.

ii. **Longitudinal Study on Sustainability of ASDSP Interventions**: A longitudinal design could evaluate the long-term effects of ASDSP financing on dairy productivity, particularly after program exit or donor withdrawal, to assess sustainability and resilience.

iii. **Comparative Analysis of ASDSP Implementation Across Counties**: Conducting a comparative study across various counties would highlight contextual differences in implementation and outcomes, thus offering insights for policy adaptation and regional customization.

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APPENDICES

Appendix I: Consent Form for Participation in Research

Dear Participant,

I invite you to participate in a research study entitled "ASSESSMENT OF THE AGRICULTURAL SECTOR DEVELOPMENT SUPPORT PROGRAMME FINANCING ON THE PRODUCTIVITY OF DAIRY FARMERS IN MERU COUNTY". I am currently enrolled for a Master's in Business Administration, Finance option at Mount Kenya University (MKU) and I`m in the process of writing my research proposal. The semi-structured questionnaire has been designed to collect information on the impact of agricultural sector development support programme financing on the productivity of dairy farmers in Meru County. Therefore, collected data will only be used for this purpose.

Your participation in this research is completely voluntary. Your responses will remain confidential and anonymous. No one other than the researcher will know your individual answers to this questionnaire. There are no direct benefits to you for participating in this research. If you agree to participate in this proposal, please answer the questions on the questionnaire as best as you can. Please return the questionnaire as soon as possible to enable me complete the proposal report.

If you have questions at any time about this study, you may contact the researcher whose contact is provided at the bottom of the page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with me, please contact the Chairman, MKU Institutional Review Ethics Committee (IREC), P.O Box 342-01000, Thika.

CONSENT

I have read and I understand the provided information. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I therefore voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature: _____Date _____

Investigator's contact: 0723500068

Thank you for your assistance in this important endeavor.

Appendix II: Questionnaire

Section A: Background Information

Please tick (✓) appropriately:

1. Gender:

   ☐ Male

   ☐ Female

2. Age:

   ☐ 18–25

   ☐ 26–35

   ☐ 36–45

   ☐ 46–55

   ☐ Above 55

3. Education Level:

   ☐ No formal education

   ☐ Primary

   ☐ Secondary

   ☐ Diploma

   ☐ Degree and above

4. Dairy Farming Experience:

   ☐ Less than 2 years

   ☐ 2–5 years

   ☐ 6–10 years

   ☐ Over 10 years

5. Number of Dairy Cows Currently Owned:

☐ 1–3

☐ 4–6

☐ 7–9

☐ Above 9

Section B: Capacity Building (Objective One)

Please indicate your level of agreement with the following statements using the scale below:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Statement	**1**	**2**	**3**	**4**	**5**
1. I have received training on dairy farming from ASDSP.	☐	☐	☐	☐	☐
2. The training has improved my animal husbandry skills.	☐	☐	☐	☐	☐
3. Extension officers from ASDSP regularly visit my farm.	☐	☐	☐	☐	☐
4. The knowledge acquired has enhanced my milk production.	☐	☐	☐	☐	☐

Section C: Subsidies (Objective Two)

Statement	**1**	**2**	**3**	**4**	**5**
1. I have received input subsidies through ASDSP.	☐	☐	☐	☐	☐
2. The subsidies have enabled me to purchase better feed and drugs.	☐	☐	☐	☐	☐
3. I can now afford improved animal breeds due to subsidies.	☐	☐	☐	☐	☐
4. The subsidy process is transparent and accessible.	☐	☐	☐	☐	☐

Section D: Marketing Strategies (Objective Three)

Statement	1	2	3	4	5
1. ASDSP has helped link me to better milk markets.	☐	☐	☐	☐	☐
2. I participate in cooperative marketing through ASDSP facilitation.	☐	☐	☐	☐	☐
3. I receive stable prices for milk through contracts.	☐	☐	☐	☐	☐
4. I use digital tools for market access introduced through ASDSP.	☐	☐	☐	☐	☐

Section E: Production Resources (Objective Four)

Statement	1	2	3	4	5
1. ASDSP provided me with dairy farming equipment.	☐	☐	☐	☐	☐
2. The equipment has improved hygiene and efficiency on my farm.	☐	☐	☐	☐	☐
3. I received infrastructure support such as storage or water tanks.	☐	☐	☐	☐	☐
4. Equipment maintenance has been a challenge.	☐	☐	☐	☐	☐

Section F: Overall Productivity

Statement	1	2	3	4	5
1. My milk yield has increased due to ASDSP interventions.	☐	☐	☐	☐	☐
2. My income from dairy farming has improved.	☐	☐	☐	☐	☐
3. My herd health has significantly improved.	☐	☐	☐	☐	☐

4. I would recommend ASDSP to other farmers.	☐	☐	☐	☐	☐

Appendix III: Interview Schedule

Introductory Statement

Thank you for participating in this study. Your views will help evaluate the influence of the Agricultural Sector Development Support Programme (ASDSP) financing on dairy farming in Meru County. Your identity will remain confidential. Kindly respond as honestly and comprehensively as possible.

Section A: Capacity Building

1. In what ways has ASDSP training influenced your dairy farming practices?
2. Have you found extension services useful in implementing what you learned?
3. What challenges have you faced in accessing training or mentorship under ASDSP?

Section B: Subsidies

4. What types of subsidies have you received from ASDSP?
5. How have these subsidies affected your productivity or input choices?
6. Are there any challenges or limitations in the subsidy system?

Section C: Marketing Strategies

7. Has ASDSP improved your access to milk markets?
8. How has cooperative or contract marketing affected your earnings?
9. What improvements do you suggest for ASDSP's marketing support?

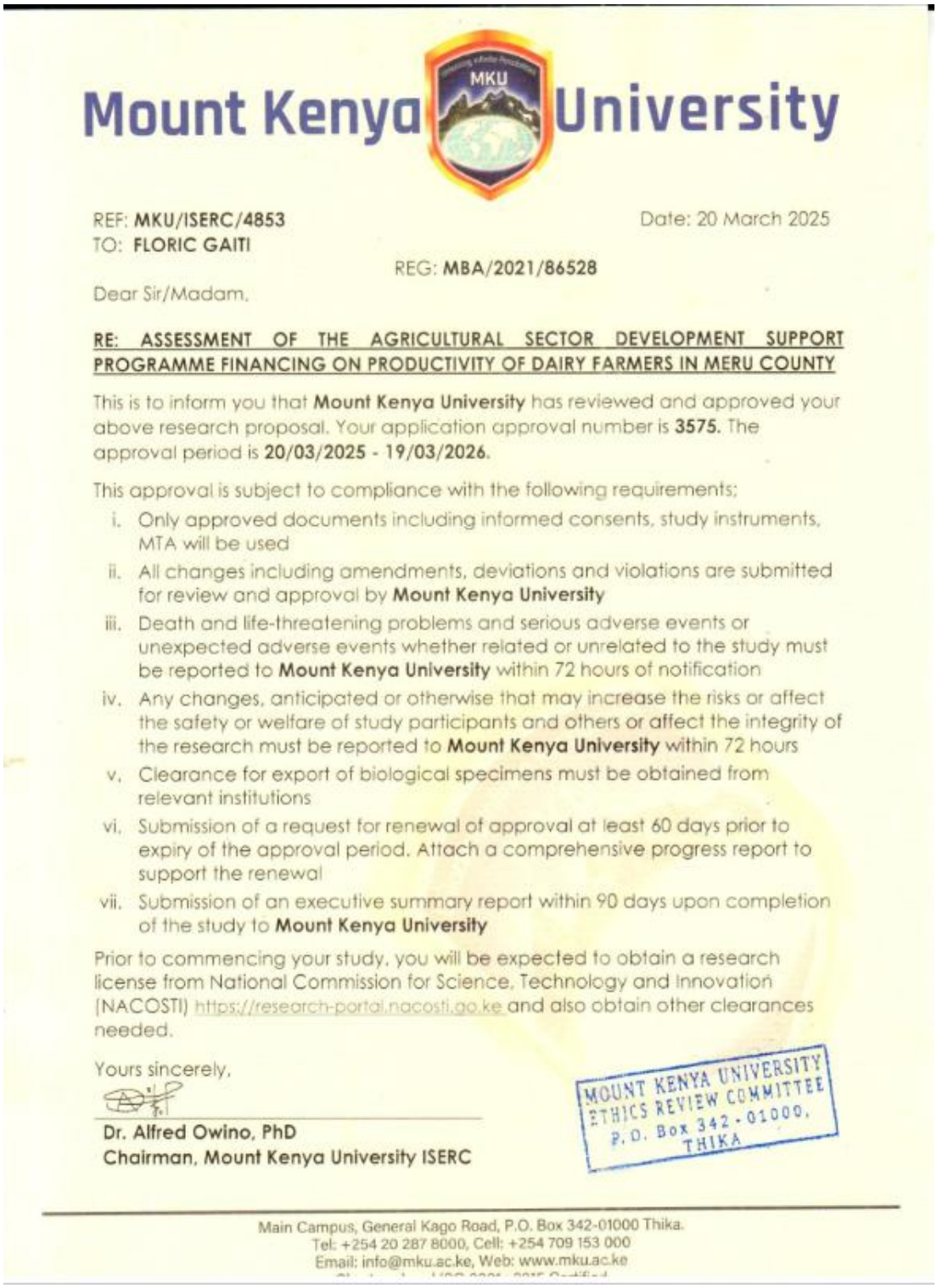
Section D: Production Resources

10. What farming infrastructure or equipment have you received under ASDSP?
11. How has this equipment impacted your daily operations?
12. Are there issues concerning maintenance, sustainability, or continued support?

Section E: General Reflections

13. Overall, how would you describe the influence of ASDSP on your dairy farming productivity?
14. What recommendations would you give to improve ASDSP delivery and outcomes?

Appendix IV: ERC Letter



Mount Kenya University

REF: **MKU/ISERC/4853** Date: 20 March 2025
TO: **FLORIC GAITI**
REG: **MBA/2021/86528**

Dear Sir/Madam,

RE: ASSESSMENT OF THE AGRICULTURAL SECTOR DEVELOPMENT SUPPORT PROGRAMME FINANCING ON PRODUCTIVITY OF DAIRY FARMERS IN MERU COUNTY

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **3575.** The approval period is **20/03/2025 - 19/03/2026.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

MOUNT KENYA UNIVERSITY
ETHICS REVIEW COMMITTEE
P.O. Box 342-01000,
THIKA

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: +254 20 287 8000, Cell: +254 709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke

Appendix V: Introduction Letter

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MBA/2021/86528

21st March, 2025

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: FLORIC GAITI – REGISTRATION NO. MBA/2021/86528

The purpose of this letter is to introduce the above named student who is pursuing **Master of Business Administration** in the department of **Accounting and Finance** in the school of **Business and Economics.**

The title of the research is **"Assessment of the Agricultural Sector Development Support Programme Financing on Productivity of Dairy Farmers in Meru County."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **April, 2025 and June, 2025.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P. O. Box 342 - 01000, THIKA
Office of the Director,
Graduate Studies

Dr. Samuel M. Karenga, PhD
Director, Graduate Studies
Enc.

Appendix VI: NACOSTI Authorization

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **497675**

Date of Issue: **08/April/2025**

RESEARCH LICENSE

This is to Certify that Ms.. Floric Gaiti of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Meru on the topic: ASSESSMENT OF AGRICULTURAL SECTOR DEVELOPMENT SUPPORT PROGRAMME FINANCING ON PRODUCTIVITY OF DAIRY FARMERS IN MERU COUNTY for the period ending : 08/April/2026.

License No: **NACOSTI/P/25/417708**

497675

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

APPENDIX VII: RESEARCH AUTHORIZATION

COUNTY GOVERNMENT OF MERU

DEPARTMENT OF FINANCE, ECONOMIC PLANNING & ICT

When replying please quote
Email: **merucounty@meru.go.ke**

Meru County Headquarters
P.O Box 120-60200
Meru

CGM/FIN/CONF/AUT/VOL.1(35)

Date: 09/04/2025

To Whom It May Concern,

RE: RESEARCH AUTHORIZATION- MS. FLORIC GAITI

In reference to a letter Ref. NACOSTI/P/25/417708 dated 8th April 2025,

This is to confirm that Ms. Floric Gaiti, has been granted authority by the County Government of Meru, Department of Finance, to conduct academic research within the county. The title of her research is: **"Assessment of Agricultural Sector Development Support Programme (ASDSP) Financing on Productivity of Dairy Farmers in Meru County."**

She is authorized to interact with the relevant stakeholders, including county officials, dairy farmers, cooperatives, and other related entities, to collect data pertinent to her research. All information gathered shall be used strictly for professional purposes and handled with confidentiality.

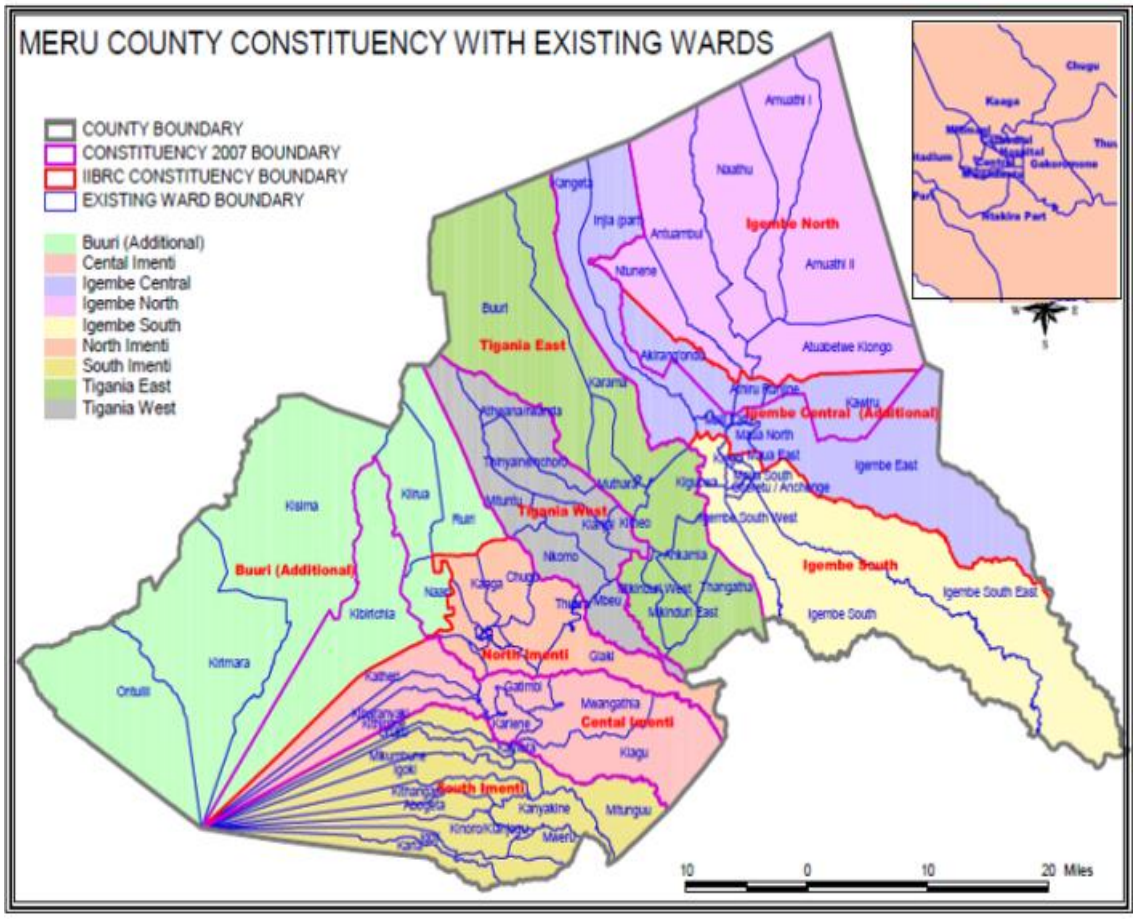
Any support given to her will be highly appreciated.

Thank you.

09 APR 2025

CPA Timothy Kaaria
For: Chief Officer – Finance, Economic Planning & ICT

Appendix VIII: Study Site Map



Appendix IX: Similarity Index

ASSESSMENT OF AGRICULTURAL SECTOR DEVELOPMENT SUPPORT PROGRAMME FINANCING ON PRODUCTIVITY OF DAIRY FARMERS IN MERU COUNTY

by Floric Gaiti

Submission date: 04-Jul-2025 05:43PM (UTC+0300)
Submission ID: 2493494253
File name: Floric-Project-Final.docx (2.25M)
Word count: 26445
Character count: 158701

ASSESSMENT OF AGRICULTURAL SECTOR DEVELOPMENT SUPPORT PROGRAMME FINANCING ON PRODUCTIVITY OF DAIRY FARMERS IN MERU COUNTY

ORIGINALITY REPORT

18%	17%	8%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.coursehero.com Internet Source	1%
2	ir-library.ku.ac.ke Internet Source	1%
3	erepository.uonbi.ac.ke Internet Source	1%
4	erepository.mku.ac.ke Internet Source	1%
5	ir.jkuat.ac.ke Internet Source	1%
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8	cdn.sida.se Internet Source	<1%
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