INFLUENCE OF MILK INTERMEDIARIES' PURCHASING STRATEGIES ON SUSTAINABILITY OF SMALL-SCALE DAIRY FARMING IN MANYATTA CONSTITUENCY, EMBU COUNTY, KENYA.

BY
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A RESEARCH REPORT PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF ARTS IN PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI

2013

DECLARATION

This research project report is my original work and has not been presented for a degree in any other University

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This research project report has been submitted for review with my approval as university supervisor

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DEDICATION

I wish to dedicate my research report to my wife Teresia Njeri and daughters Hilda Mumbi, Ann Muthoni, Frida Mwende and Grace Wangeci who have always encouraged and given me their moral, physical and psychological support while carrying out the research and entire course. God bless them mightily.

ACKNOWLEDGEMENT

This work has been accomplished through assistance of various individuals. I acknowledge hard work and devotion of my supervisor Pro. Christopher M. Gakuu. He has been providing spontaneous feedback whenever I submitted my work to him. He has therefore, been very helpful in guiding and helping me to write this research project report. I appreciate the role played by the Research Methods lecturer Mrs. Jane Gatumu and all the lecturers who taught me during my course work. They laid a foundation upon which this study will be made. I also appreciate the services offered by staffs of Nairobi University Embu centre led by centre coordinator Mr. Rugendo Chandi. I also want to appreciate the Ministry of Livestock Development for giving me a chance to pursue this master degree. I cannot forget the support and encouragement from my fellow planning and management course participants as we struggle to meet course deadlines.

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ABBREVIATIONS AND ACRONYMS

AI	Artificial Insemination
KARI	Kenya Agricultural Research Station
GDP	Gross Domestic Product
ILRI	International Livestock Research Institute
IMPB	Intermediaries Milk Purchasing Strategies
KCC	Kenya Co-operative Creameries
KDB	Kenya Dairy Board
MIT	Market Intermediary Theories
PDLP	Provincial Director of Livestock Production
RDT	Resource Dependency Theories
SHG	Self Help Groups
SPSS	Statistical Package for the Social Science
USAID	United States of America Aids for International Development
SSDF	Small-Scale Dairy Farming

ABSTRACT

Small-Scale Dairy Farming (SSDF) experiences market challenges influenced by purchasing strategies of milk intermediaries. Some of the challenges include low milk prices, inappropriate information on contract milk marketing, inadequate dairy farming inputs/services. The purpose of this study was to investigate influence of milk intermediaries' purchasing strategies on sustainability of SSDF in Manyatta Constituency, Embu County. The study was informed by literature review, theoretical framework and empirical studies as secondary data. Descriptive survey design was used in order to capture subjective views of the respondents. Glenn formular was used to calculate a sample size of 390 respondents from target population of 16200 small-scale dairy farmers. Stratefied random sampling was used to get a representative sample size of 130 respondents from each administrative division in the constituency. Purposive Sampling procedure was used to select 27 secondary respondents to represent 27 milk intermediaries. Primary data was collected using questionnaires. Collected data was analyzed using descriptive statistics such as frequency, mean and percentages using Microsoft Excel Computer package. Data was presented using tables. The study revealed that pricing decisions by milk intermediaries influenced small-scale dairy farmers negatively; only a few farmers sold milk on contract basis which were verbal; majority of the small-scale dairy farmers acquired farm inputs and services from private agro vet shops and private service providers respectively despite the high cost. The purchasing strategies of milk intermediaries influenced sustainability of SSDF negatively. The study therefore recommended that the ministry of Livestock should encourage dialogue forums between small-scale dairy farmers and milk intermediaries when milk pricing decisions are made. Farmers should be encouraged to sell milk on contractual basis which should be written; the Ministry of Co-operative development should encourage farmers to form dairy co-operative societies to help them get dairy farm inputs/services at a fair price and on credit basis. It is hoped that implementation of these recommendations may help to mitigate micro-dynamic market challenges encountered by SSDF.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The livestock sector plays a vital role in the economies of many developing countries. It provides animal protein in human diets, income, employment and possibly foreign exchange (FAO, 2008). Livestock contributes about 50 percent of Agricultural GDP and over 10 percent of the national GDP (Staal, 2003). Dairy farming is the largest contributor to the livestock GDP, accounts for an estimated 33 percent of the agricultural GDP (Staal, 2003). The Dairy farming which is a dynamic sub-sector in Kenya, is a major source of livelihood for the families of about 600,000 - 800,000 small-scale farmers for whom dairy farming is a primary activity (Yacob, 2008).

Dairy farming sub-sector also offers employment along the milk marketing chain (365,000 jobs). It constitutes the largest share of livestock contribution to the country's GDP i.e. 3.5% total GDP (Staal, 2003). SSDF accounts for over 70% of total milk production (Yacob, 2008). Livestock also serves as a store of wealth; provide draught power and organic fertilizer for crop production as well as means of transport for low-income producers (Abedulla 2005). Dairy farming by small-scale farmers is practised to produce milk for feeding the family and for sale. It is also done to produce manure to support crop production. In Dairy farming, animals are a kind of insurance for social status and enables emergency cash needs financing (Banda et al., 2000; Bebe et al., (2003)

Milk production began approximately 6000 years ago and has been an integral part of the human diet ever since. Various animals including buffalos, cows, sheep and goats produce milk. Total world milk production is dominated by cow’s milk followed by buffalo, goat and sheep (Olgun & Artukoglu 1995). It is the most suitable food for young mammals, provides both energy and the building materials necessary for growth (Perman, 1996). Milk is one of the most important foods of human beings. It is universally recognized as a complete diet due to its essential components like proteins, lactose, milk fat, minerals and vitamins in a highly digestible form and

is recommended as compulsory part of daily diet for the expectant mothers as well as growing children (Shah & Khan, 1982).

Small-scale dairy farmers produce the vast majority of milk in developing countries where demand is expected to increase by 25% by 2025 (Shah & Khan, 1982). Dairy farming exports from developing countries have increased in value by 43% between 1998 and 2001 (Perman, 1996). Small-scale farmers form the bedrock for global agrifood but they are faced with markets challenges in an unprecedented state of flux (Banda et al 2000). The middlemen who buy milk from small-scale make instant cash payments whereas it takes 12-15 days to realize payments from the cooperative system (Kurup, 2003).

Market-oriented dairy farming dates back to the early 20th century but indigenous Kenyans were only allowed to engage in commercial dairy farming after the Swynnerton Plan of 1954 (Conelly, 1998). There was a rapid transfer of dairy cattle from the settler farms to the small-scale soon after independence in 1963. The government policy mix that followed combined with direct intervention and statutory control of production and market activities, benefited small-scale dairy production and marketing. These highly subsidized interventions were however not sustainable and by the 1980s, the quality of livestock services provided by the government had declined, prompting it to adopt reforms such as structural adjustment and economic restructuring (Ngigi, 2002) which have also failed to uplift small-scale farming SSDF.

Informal milk marketing channel accounts for about 85% of marketed milk. Only 15% of marketed milk flows through the formal market via cooperatives and processors (Thorpe, 2000; USAID, 2008). The number of small-scale is estimated at more than 650,000 which pose a challenge in controlling quality (KDB, 2008). Given the importance of an assured and steady market for milk and milk products and the fact that both organized and unorganized market agents are likely to continue to play critical roles in the marketing of milk, it is important to understand the micro-dynamics of market strategies of various milk agents so as to enable the small-scale to capitalize on their strengths for the financial benefits of rural producers (USAID, 2008).

The formal sector provides an assured and permanent market as well as a number of other livestock support services. However the informal sector scores over the formal sector by virtue of the fact that in many areas it is the only marketing channel open to the rural producer (USAID, 2008). Other benefits accrued from informal sector include; instant payments, slightly higher prices, offering short term instant cash credit and providing milk collection service at farmers' doorstep (Thorpe, 2000). Despite these services, studies done in India suggested that in areas where no formal channels exist, informal traders resort to exploitative practices including under-weighing, charging high interests on cash loans advanced to farmers, low prices and so on. There is cartelization by private traders leading to monopolistic price setting for milk procured and high interest charged on the cash advanced to farmers as demonstrated by Ray (2000).

During Kenya's post-independence history, producer and consumer milk prices were controlled by the minister in charge of livestock development and more recently through the KDB (USAID, 2008). In May 1992, reforms took place in the industry and price controls were abolished to create a competitive self-sustaining dairy farming industry, characterized by increased private sector participation (Owango et al., 1998). After liberalization, real milk prices rose by 20-40% between 1992 and 1994, but appear to have remained relatively stable since then (Owango et al., 1998). The requirements of the Kenya Dairy Board (KDB) are that every retailer must have fixed premises before qualifying to receive a license (Omore et al., 2004).

This study therefore, intends to investigate the influence of milk intermediaries' purchasing strategies on sustainability of SSDF in order to suggest ways that could improve SSDF in Manyatta Constituency, Embu County, Kenya

1.2 Statement of the problem

Following the privatization of milk marketing and the opening up of the dairy farming sector to competition, there has been a decline in the real prices, particularly the farm gate price for milk. Liberalization/privatization of the dairy farming sector reduced farmers to price takers. The prevailing situation is that the milk intermediaries determine the farm gate price for milk without consideration for the farmers' cost of inputs and production. In small scale dairy farming SSDF

in Kenya, the revival of the cooperative societies has helped dairy farmers improve their bargaining power.

Access to emerging markets and benefit-sharing patterns from milk trade is largely skewed in favor of large scale suppliers (Davis, 2007). Although opportunities for growth and poverty reduction through commercialization of dairy products are immense, identification of these opportunities as well as the constraints seldom incorporates small-scale dairy farmers as primary beneficiaries.

Small-scale dairy farmer face many problems ranging from low milk prices, inappropriate information on contract milk marketing, inadequate inputs/services that do not sustain the SSDF. In addition, there is poor co-ordination of interventions measures such as implementation of institutions which lack consensus in priority setting (Republic of Kenya, 2005). This leads to resource wastage on non-priority areas, duplication of efforts and low participation of farmers in commercialization (Balint, 2003). Consequently, food insecurity and widespread poverty continue to be daunting challenges.

Improvements in market incentives are necessary to facilitate a shift from subsistence to commercial agriculture and also to guarantee SSDF equitable benefits from market integration (Pingali, 1997). The existing milk market conditions do not adequately motivate farmers to exploit their full productivity potential especially with regard to sustainability of SSDF.

This study intended to unearth the milk intermediaries' micro-dynamics purchasing strategies that influences sustainability of SSDF in order to suggest ways that could help small-scale' dairy farmers to capitalize on their enterprises strengths.

1.3 Purpose of study

The purpose of this study was to examine how milk intermediaries purchasing strategies influenced sustainability of SSDF in Manyatta Constituency, Embu County, Kenya.

1.4 Objectives of the Study

This study was guided by the following objectives;

i. To establish how milk pricing decisions by milk intermediaries influenced sustainability of SSDF.
ii. To establish how contract milk purchasing arrangement by milk intermediaries influenced sustainability of SSDF.
iii. To examine the extent to which provision of inputs/services by milk intermediaries influenced sustainability of SSDF.

1.5 Research Questions

i. How does milk pricing decisions by milk intermediaries influenced sustainability of SSDF?
ii. How does contract milk purchasing arrangement by milk intermediaries influenced sustainability of SSDF?
iii. To what extent does provision of inputs/extension services by milk intermediaries influenced sustainability of SSDF?

1.6 Significance of the study

The study was important as it could help unearth milk intermediaries' purchasing strategies which influenced sustainability of SSDF. The findings formed a base upon which recommendations were made which may help the SSDF to understand milk pricing strategies which influenced sustainability of SSDF. The findings could also help the Ministry of Livestock Development and the private sector in achieving the transition from direct public interventions to more market-oriented interventions and stimulate a policy dialogue between SSDF and milk intermediaries.

1.7 Delimitation of the study

The study was delimited to small-scale dairy farmers and milk buying intermediaries in Manyatta constituency. To make the study manageable within limited finances and time frame it only focused on three variables namely:- milk pricing, contract milk purchasing arrangement, provision of inputs/services and milk intermediaries in Manyatta constituency, A representative

sample of the small-scale milk producers and milk intermediaries in Manyatta constituency were the primary and secondary respondents respectively of the study.

1.8 Limitations of the study

The study focused on SSDF in Manyatta Constituency and was limited to sampled population due to time and finance constraints. The research focused on variables indentified in the study though there could be others factors besides intermediaries' milk purchasing strategies at play thus limiting the study.

1.9 Assumptions of the study

1. There existed correlation between intermediaries' milk purchasing strategies and sustainability of SSDF.
2. The respondent would be willing to participate in the study and would be honest when completing the questionnaires.

1.10 Definition of Significant Terms

Small-scale dairy farmers are milk producers with 1-5 dairy cows who are involved in milk selling to milk intermediaries.

Milk Intermediaries are agents who purchase milk from small-scale dairy farmers for re-sale to consumers.

Purchasing Strategies are trade characteristics displayed by milk intermediaries to small scale dairy farmers in the process of buying milk.

Sustainability refers to a continuous deriving of profits from a dairy farming undertaking through sale of milk and it is able to sustain itself.

Milk Pricing Strategies: These were methods used by milk intermediaries to price milk as they purchase milk from SSDF e.g. failure to involve SSDF in milk pricing decisions,

Contract milk purchasing arrangement: Agreement made between SSDF and milk intermediaries on price of milk, time/period of milk payment, place/time of milk delivery and amount of milk.

Provision of inputs/services: These were dairy inputs/services offered to SSDF by milk intermediaries. Payment of inputs/services is in cash or deduction from milk sales.

Primary respondent: Small-scale dairy farmer with 1-5 dairy cows who are involved in milk selling to milk intermediaries.

Secondary respondent: Milk Intermediaries who purchase milk from small-scale dairy farmers for re-sale to consumers.

1.11 0rganization of study

The research study was organized in 5 chapters. Chapter one comprised of general background of study which included: statement of the problem, purpose of the study, objectives of study, research questions, significant of study, delimitation and limitations, assumptions, definition of significant terms and organization of study. Chapter two included literature reviewed alongside study variables i.e., milk intermediaries, milk pricing, contractual milk purchasing arrangements and provision of inputs/services. It also contained theoretical framework, conceptual framework and summary of chapter two. Chapter three comprised of methodology of study which included: research design, site of study, target population, sampling procedure, sample size, method of data collection, pilot testing of instruments, validity and reliability, operationalization of variables, method of data analysis, ethical consideration, and summary of chapter three. Chapter four covered: data analysis, presentation and interpretation. Chapter five included: summary of findings, discussion of findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

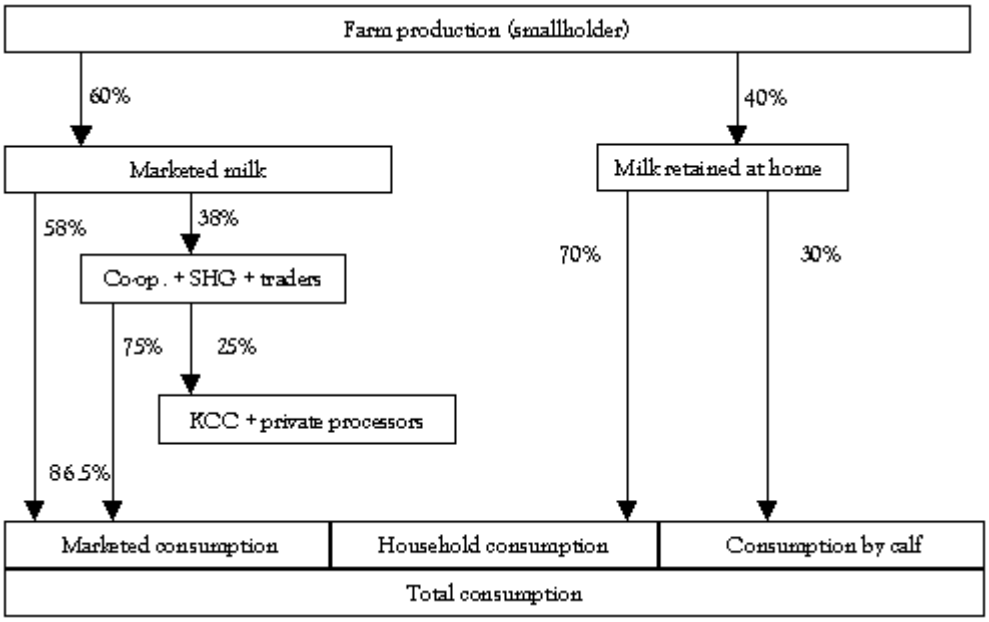
This chapter reviewed related literature on the influence of milk intermediaries' purchasing strategies on the sustainability SSDF. The main purpose of this section was to show causation relationship between milk intermediaries purchasing strategies and the sustainability of SSDF as informed by reviewed literature and theoretical framework. The first section presented related literature with an emphasis on different variables identified in this study. The second section examined theoretical framework informing the study which were Market Intermediation Theory (MIT) and The Resource Dependency Theory (RDT). This information illuminated to the study how the causation relationship mentioned above could occur. The last section presented the conceptual framework which diagrammatically represented the relationship between various variables of the study. The chapter ended up with a summary highlighting conclusions made from this chapter.

2.2 Milk marketing intermediaries and sustainability of SSDF

The milk markets comprised of numerous types of intermediaries who were distinguished by scale of operation and the buyer/seller clients they served. Milk intermediaries performed various marketing functions such as transportation of milk, retailing milk, and linked the dairy farmers (producers) and the consumers. The main interest of the marketing intermediaries was to gain the highest profit possible from their particular business operation (FAO, 2002).

According to FAO/ILRI (2001) dairy farming product markets typically differed in several key ways such as; the types of products handled and the number of intermediaries involved in addition to the roles each played. The first two aspects were often linked because more processed products produced higher value products which often involved more intermediaries, each of whom added some delivery or transformation service to the product (USAID 2008). Simple distance between source and sales areas, or the density and scale of the production system, even without product transformation, could also increase the number of intermediaries, due to the need for assembling, bulking, transporting and distributing (FAO 2001).

SSDF faced many hidden costs that made it difficult for them to gain access to markets and productive assets (Staal et al., 1997). Among the barriers that could be influenced by policy were transaction costs, the pecuniary and non-pecuniary costs associated with arranging and carrying out an exchange of goods or services (Omore et al., 1999). The relatively high marketing costs for fluid milk in Africa is caused by the scattered nature of fluid milk markets and the risk attached to marketing of perishables in the tropics suggested that transaction costs played a central role in dairy farming production and marketing (USAID 2001). Under such conditions collective action in producer marketing cooperatives, milk traders groups etc could effectively reduce transaction costs that might enhance market participation (Thorpe et al., 2000). It was, therefore vital to study what these organizations and their emergence could do to boast the SSDF in order to make informed suggestions to the government and other stakeholders.



Source: Modified from Omore et al. (1999)

Figure 1 : Milk Marketing Channels.

On-farm consumption (non-marketed milk) accounted for about 40% of milk and the remaining 60% was marketed through various channels as shown in figure 2.1. Less than 25% of marketed milk flowed through milk processors (Thorpe et al., 2000), who included Brookside, Spin Knit, Premier, KCC and other smaller private processors. The balance of marketed milk was sold as raw milk. Non-processed milk marketing channels included: direct milk sales to consumers by

farm households (75%); and milk collected by dairy farming co-operative societies, self help groups and individual milk traders who also sold either directly to consumers or to processors.

Bain (1968) defined market structure as characteristics of a market, which seemed to influence strategically the nature of competition and pricing strategies within the market. Wolday and Eleni (2003) further stated that, food-marketing systems should be evaluated in terms of the degree of market concentration, barriers to entry (licensing procedure, lack of capital and know-how, and policy barriers), and the degree of transparency. Likewise, Gebremeskel et al., (1998), in describing elements of structure and conduct, emphasized that among the major structural characteristics of a market were the degree of concentration, that is, the number of market participants, their size, distribution; and the relative ease or difficulty for market participants to secure an entry into the market. Market conduct referred to the strategies of firms or the strategy they used with respect to pricing, buying, selling, etc., which could take the form of informal cooperation or collusion.

Kohls and Uhl (1985) described marketing as involving the transformation of goods in space, time and form from producers to consumers at the lowest possible cost. In the same vein, Harris (1995) stated that a marketing system could be regarded as a multi-layered sequence of physical and other activities, and of transfer of property rights from the farm-gate to the consumer. They further emphasized that marketing systems were inherently complex in structure arguably much more so in agricultural production (Kohls & Uhl 1985). Thus, although trading firms were assumed to buy and sell, in practice they performed many more activities in addition, such as: brokerage, storage, processing, transport, financing trade and products' production (Harris 1995).

A study of the milk marketing system in Kenya showed that there were at least eight different marketing channels, with the number of intermediaries ranging from 1 to 4 (FAO 1996). A major problem for those who supplied milk through dairy cooperatives was delayed payments. The number of requests to KCC by small-scale farmers to supply milk as individuals might have increased rather than through cooperatives societies due to intensified dairy farming and the need to have regular income to service dairy farming activities (World Bank, 1989). The following

were the roles played by milk intermediaries for the SSDF according to a survey carried out by Omore et. al. (1999) at Kiambu and Nyandarua districts in Kenya:

2.2.1 Co-operative societies

This agent provided a reliable permanent market with no limit supply of milk and paid monthly lumps sum to farmers enabling farmers to plan their expenditures. They also offered inputs/services such as artificial insemination (AI), tractor hire on credit and provided cash loans to farmers. However, this agent posed the following challenges to the SSDF; low prices, delays in payments, under weighing, adulteration and stealing by workers, cost appended to rejected milk even if workers carried the blame, mismanagement of accounts and factionalism, registration fee and charged a fee for a break in supply

2.2.2 Hawkers/Middlemen

Although hawkers/middlemen paid instantly high prices, sometimes they disappeared with farmers' money when winding up. Payments with hawkers could be negotiated daily or monthly but because there was no written agreement, such contracts were not always honored. These agents did not provide a reliable market and did not supply dairy farming inputs/services to the farmers. Where there was no other outlet, there were arbitrary changes of prices to suit their interest especially when the supply was high.

2.2.3 Hotels/Milk-bars/Kiosks

These agents paid slightly higher than cooperative societies but they did not offer market security as their businesses could be closed any time they were not available. They also did not offer credit facilities or inputs/services to SSDF**.** They paid on a daily or weekly basis which denied farmers lump sum money to invest in their daily SSDF.

2.2.4 Private Dairies

Private dairies paid better prices than co-operative societies. They bore cost of milk spoilage, gave true weights and provided prompt monthly payments. However, these channels were not reliable and at times went into receivership when they were unable to meet expenditure costs.

They also arbitrary changed the amount they bought and prices without prior warning to the farmers to suit their own interests.

The informal sector scored over the formal sector by virtue of the fact that in many areas it was the only marketing channel open to the rural producer. The informal sector also paid slightly higher prices, offered short term instant cash credit and provided milk collection service at farmer doorstep, provided permanent market as well as a number of other livestock support services. Some of the studies also suggested that in areas where no formal channels existed, informal traders resorted to exploitative practices such as under-weighing, charging high interests on cash loans they advanced, low prices and so on, as demonstrated by cartelization by private traders leading to monopolistic price setting both for milk procured by them and the interest charged by them on the cash advanced (Ray, 2000).

2.3 Milk pricing and sustainability of SSDF

According to Kotler and Armstrong (1996), the major external factors that affected pricing decisions included the nature of the market, demand, competition, and other environmental elements (such as weather conditions). Whereas costs did set the lower limit of prices, the market and demand could often set the upper limit. According to Armstrong (1996), it was important for the marketer to understand the relationship between price and the demand for the product. It was generally believed that consumers usually purchased the cheapest milk on the shelf. This could be an indication of the value that they attached to the perceived benefits resulting from milk (Kotler &Armstrong 1996),

Small-scale' dairy farming SSDF offered significant scope for diversification and augmenting income and employment generation for small and marginal farmers (NDDB-ORG, 2001). Like any other project, the profitability and sustainability of dairy farming production depended upon its cost structure and a remunerative price, for which a good marketing outlet was crucial. According to a report of milk marketing in India, (Grover *et al*., 1990 & NDDB-ORG, 2001) the following factors affected small-scale' milk price:

- In several places, middlemen developed cartels which were detrimental to the farmers' interests. The cartels were so strong, that even in scarcity season (summer) the farmers were

not able to raise their prices significantly. This happened because middlemen extended necessary credit to the farmers for purchase of animals' feeds and locked procurement volumes to the repayment period. They dictated prices as they were the only marketing outlet for the farmers.

- Prices offered by the informal sector were higher in areas where dairy cooperatives were present, as an alternative channel. Thus, dairy cooperatives often helped to determine a floor price for milk.

- The absence or low presence of facilities like credit, procurement services in formal sector created a situation where it pushed/compelled the small-scale dairy farmer to enter into arrangements with middlemen that were not necessarily beneficial. However, larger farmers who did not depend on middlemen for finance found the middlemen rates better than those offered by cooperatives.

The key determinants of buying strategies at the consumer level were—price, home delivery, regular and timely supply of good quality fresh milk. After liberalization, real milk prices rose by 20-40 % between 1992 and 1994, but appeared to have remained relatively stable since then (Owango et al., 1998).

Competition often had a major influence on price. Intense competition in the milk industry produced frequent price wars. Price wars normally started in recessionary periods, when consumers were more price conscious, and had a goal of minimizing their living costs (Murray & O' Driscoll, 1996:330). Murray and O' Driscoll (1996), suggested ways to avoid price wars. The first was to avoid strategies that forced competitors to respond with price adjustments. Secondly, companies needed to price according to the value of the product, not for competitive parity. Thirdly, companies could communicate pricing decisions carefully, so that they were not misled by competitors or consumers. Finally, companies could avoid reaction and use of pricing as a counter offensive technique (Natalie, 1999**).**

Internal factors affecting price included the company's marketing objectives, marketing mix strategy, costs and organizational factors (Kotler & Armstrong, 1996). Price decisions could be

coordinated with product design, distribution and promotion decisions to form a consistent and effective marketing programme (Kotler, 1997). Dairy farming companies often made pricing decisions first, when marketing fresh milk and then based other mix decisions on prices they needed to charge.

Marketing objectives enabled a firm to set competitive prices. Examples of objectives could include survival, current profit maximization, market share leadership and product quality leadership (Kotler & Armstrong, 1996). Companies set survival as their major objective when they experienced heavy competition or changing consumer needs. Survival could only be a short term objective, because the company needed to learn how to add value to their products or could face extinction (Kotler & Armstrong, 996).

Costs set the basic price that a company could charge for its product. Milk intermediaries gave milk price that covered all production, distribution and selling costs. Dairies that sold fresh milk could work to become 'low-cost producers' in the industry, which allowed them to set lower prices (Kotler & Armstrong, 1996). Milk companies (intermediaries) decided who within the organization should set prices. In smaller milk companies, prices were often set by top management, rather than by marketing or sales departments (Kotler & Armstrong, 1996). Intense competitiveness in the dairy farming industry caused many milk companies to allow their representatives to negotiate the prices of fresh milk at the store level. A price strategy could fit into the total marketing strategy. There could be a close relationship between price and the other mix elements (Ferrel et al., 1994)

2.4 Contractual milk purchasing arrangement and sustainability of SSDF

Contract farming is an agricultural production carried out according to an agreement between farmers and a buyer which places conditions on the production and marketing of the commodity (Minot, 2003). Such an agreement could be oral or written (Roy, 2006). Two forms of contracts engaged in by producers and market intermediaries existed: formal and informal contracts. In general, formal contracts were written contracts between an integrator company and a farmer, where the rights and obligations of each party were strictly defined. Contract farming can be considered an effective institutional response to overcome market imperfections (Glover & Mustered, 1990). Informal contracts were unwritten but nevertheless binding agreements

between a farmer and his market intermediary, which could either be a trade for inputs or outputs, or with a cooperative which is a member of, on the provision of inputs or the marketing of output, or both (Costales at al., 2009).

According to study by Remant at al., (2006), content of formal contract covered certain basic clauses concerning price, quantity, quality, conditions under which produce could be accepted, and at what point title on produce could pass from producer to buyer, and responsibilities of parties when risk factors were realized. Respect for these clauses determined success of the contract transaction while continued engagement in the contract arrangement depended upon the benefits derived by contracting parties. Verbal contracts, by their nature tended to be based on trust, which could take long to cultivate. They were characterized by high levels of contract breaches **(**Remat at al., 2006). In the dairy farming, informal contract offered the guarantee of supply of intermediate inputs, livestock services, and market outlet for the SSDF in exchange for the guarantee of supply of milk to the processor, through its intermediary (Costales at al., 2009).

Contract farming could be successfully used by businesses to link small-scale producers to modern markets where capital, technology and market access constituted key limiting factors (Eaton & Shepherd, 2001). Contracts provided benefits to traders and processors by removing the risk of periodic shortages and volatile prices, which could be costly if they were servicing large downstream contracts written in advance of a season (Hayami & Otsuka, 2003). It also allowed access to land which could not be available to expand plantation-scale production. Contract farming could also be an effective mechanism for risk management, because a well run contract scheme with proven production technology and guaranteed markets could help reduce risks normally faced by unorganized dairy farming project (Hayami & Otsuka, 2003). Farmers with small landholdings could use contract as a guarantee for loans (FAO, 2008). A number of financiers were prepared to provide cash flow credit to SSDF who had secured contracts.

When buyer-seller relationships were considered with regards to milk markets, due consideration was given to the strategic roles that contractual arrangements could play in conveying non-monetary exchange values that were intrinsically important to exchange-partners. Equally

significant was the notion that relational transactions were mainly founded on trust (Fafchamps, 2003) and safeguarded by contracts, which might either, be explicit or implicit forms.

The potential usefulness of such contractual arrangements during milk sales was especially apparent when examining the two peculiar aspects observed in the sale of milk by SSDF. Firstly, prices differed widely within the same location and time despite local milk markets being relatively well integrated (Staal, Delgado & Nicholson, 1997). Secondly, spot sales for cash tended to be at a higher unit price than sales where the producer only got paid a month later. In line with this, direct sale to household consumers offered the widest range of contractual arrangements. This could partly be explained by the relative ease of negotiating customized contracts with neighboring households and partly by geographical segmentation of household consumers (Fafchamps, 2003). Household consumer market was commonly geographically segmented, with sales to neighboring households and acquaintances being more oriented to credit sales, while sale to unknown households in further away market centres could be more oriented to cash-sale contracts.

Raw milk was a highly perishable (non-stock) commodity with a daily flow (once or twice-a-day harvest) of marketable streams that extended for at least a full lactation period (Ngigi, et al., 2000). The frequency of market transaction therefore tended to be very high (Staal, Delgado & Nicholson, 1997). It was reasonable to presume that there was value in contractual forms designed to offer market assurance to producers, that streams would be maintained, especially when milk was plentiful on the market during the rainy season and producers face the risk of not being able to sell a non-storable commodity (Ngigi, et al., 2000). It was therefore expected that the farmer did not search for market outlets one transaction at a time. Rather, the farmer was expected to engage in a purposive effort to secure transactions over the horizon of at least one full lactation period (about one year) (Ngigi, et al., 2000). This suggested that repeat transactions under a contractual arrangement were preferable to many farmers when compared to simple spot transactions.

Another feature of particular significance when discussing SSDF milk marketing contract, was the typically small quantity of individual daily marketable surplus (Nicholson, 1997). This

coupled with the usual practice of paying bills and wages at the month's-end, placed a great significance on the timed-pattern of milk payments. Ngigi, et al., (2000), rightly described lump-sum payments could be intrinsically valuable where liquidity flow was required in lumps to match lumpy expenditures e.g., school fees or farm production expenditures and there was little financial intermediation. Furthermore, receiving daily payments in coins for small transactions had obvious disadvantages in any society, especially without banks over a reliable periodic settlement in larger amounts (Staal, Delgado & Nicholson, 1997).

It was therefore logical to presume that contractual arrangements that combine repeat transactions with the ability to accumulate daily payments (so as to hand the farmer a lump sum amount at weeks, fortnights' or months-end) were preferable to the receipt of a daily stream of small amounts of money (FAO 2001). According to a Final Report on Agricultural Marketing Systems Study, conducted in Ethiopia, unpredictability of milk volume had also been raised as one more risk faced by producers. Farmer respondents mention that they were forced to change their outlets many times within a given time period (USAID 2000). Further probing as to the reasons indicated that volume unpredictability inherent in milk supply from SSDF was one of the culpable factors causing the reliability-of-outlet constraint (FAO 2001). Marketable surplus from a SSDF was a residual of home consumption and this production often varied. This coupled with the fact that the farmer could sell in a number of different market outlets meant that the aggregate volumes received by the buyer could fluctuate substantially on a daily basis (Omore et al., 1999). Added to this was the fact that production was mainly based on rain-fed pastures and crop residues, with little or no concentrate supplements.

2.5 Provision of inputs/services and sustainability of SSDF

Cooperatives sought alternative buyers for their milk among the emergent private dairy farming processors and diversified into providing artificial Insemination (AI), veterinary and feed supply services, with the provision of short-term credit for those services to their members (Owango et al., 1998). The provision of inputs and services on credit served both to keep members' loyalty and to maintain milk yields, keeping milk intake levels high and gave the cooperatives economies of scale in their marketing and input supply. Dairy farming co-operatives had in the past significantly contributed to the development of the SSDF milk marketing and provision of farm inputs and services at relatively lower costs (Omiti et al., 2000).

According to Staal (2001), dairy farming cooperatives had typically been formed in response to a fundamental farmer problem, the inconvenience of small quantities of milk to market. Milk was perishable and required special handling to ensure quality and shelf life. Unlike grain, which could be purchased in small quantities, and gradually bulked by a market agent over days or weeks before delivery to the next market point, milk must be collected and transported quickly. According to Owango et al., (1998), holding milk, particularly in rural developing country settings where infrastructure was lacking, could be costly and risky. On the other hand, the rapid delivery of small quantities of milk to market might not be practical or economic; some SSDF might market not more than 1-2 litres of milk on a given day. The practical collection and transportation of milk to market therefore required some bulking, and the need for speed and reliable good organization of that bulking (Staal 2001),

Therefore, there was strong incentive for SSDF to try to form collective organizations to meet these needs of bulking and reliability (Staal, 2001). It might be noted that milk bargaining power to improve milk prices might not be as important as the reason for group formation in order to simply have a reliable market mechanism as in many cases farmers were willing to accept lower prices in return (Woldu, 2004). Market opportunities were thus central to SSDF group formation and the two issues shared some basic underlying features. It might also be noted that dairy farming needs of most urban towns were not supplied by the pasteurized milk or processed products; rather raw milk markets were generally large everywhere and played an important role for dairy farming farmers' groups (Bebe, 2003)

Weakness could however arise from the small scale milk output, 10kg per farm per day, could result in low bargaining power and limited ability to capture scale of economy in the market, the poor rural infrastructures, reliance on rainfall for production and the poor milk markets (Muriuki, 2002) .

Transaction costs were the embodiment barriers to market participation by resource-poor small-holders. They included the costs of searching for the partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading

partners (officials) to reach an agreement where its conditions were fulfilled, and enforcing the exchange agreement (Holloway et al., 2000). The nature of milk and its derivatives in part explained the high transaction costs associated with exchanges of fluid milk. Raw milk was highly perishable and, thus, required rapid transportation to consumption centers or for processing into less perishable forms.

Further, bulking of milk from multiple suppliers increased the potential level of losses due to spoiling (Woldu, 2004). These loses limited marketing options for small and remote dairy farming producers, raised transaction costs, and implied greater losses due to spoilage than for commodities such as grain. Collective action was widely recognized as a positive force for rural development in Africa. Groups enabled individuals to empower themselves and to increase benefits from market transactions. Getting together with others also could allow individuals to better cope with risks particularly when neither the private sector nor the government provided any insurance against risk (Place *et al.*, 2002).

A common form of collective action to address access problems of this type was participatory, farmer-led cooperative that handled input purchasing and distribution and output marketing, usually after some form of bulking or processing (Place *et al.*, 2002). They were helpful in overcoming access barriers to assets, information, services and indeed, the markets within which dairy small-scale farmers wished to sell high-value items. However according to Akwabi-Ameyaw (1997) producer cooperatives in Africa had a generally unhappy history, because of difficulties in holding management accountable to members. This led to inappropriate political activities or financial irregularities in management and an over-ambitious investment beyond management's capability in terms of scale and SSDF (De Jary et al., 1993; Akwabi-Ameyaw, 1997). Considering their vital function in transforming agriculture and integrating rural economies, there had, however, been an appalling lack of knowledge on market institutions, best practices, protocols and innovative approaches in the post-liberalization era to facilitate access to markets and other essential services for the poor (De Jary et al., 1993)

One exception of the cooperative model of collective marketing of products by many traders with little value added was when a small group of firms worked together to meet a regular

demand of a specific client (Johnson et al., 2002). This was observed among small groups of mobile milk traders who work together to meet the regular demand of milk in a specific market. They tended to pay for and were paid for the milk they traded in individually but they operated under one umbrella of a group and were governed by some norms and rules. Some went as a group to buy the milk and sold it to a specific market. This allowed them to share information, encourage one another in the business, build trust with the producers, reduced the transaction costs of monitoring, and could easily be reached by the regulators (De Jary et al., 1993). They sometimes shared contracts with sellers and buyers when there was more demand or supply. They also taught those new to the business how to manage it. Producers build trust with them such that one trader could not default payment of a farmer's milk or cheat on them e.g. claiming that the milk got spoiled or never sold it. This was because the traders did the business together and monitored each other (Johnson et al., 2002).

2.6 Theoretical Frame Work

Different theoretical approaches have been used to explain intermediaries' strategies on sustainability of small-scale SSDF. This study use Market Intermediation Theory (MIT) and Resource Dependency Theory (RDT) to inform the study on influence of intermediaries' milk purchasing strategies on sustainability of SSDF.

2.6.1 Market Intermediation Theories

The proponents of Market Intermediation Theories (MIT) were Biglaiser and Gehrig (1993), modified by Spulber (1996), Rust and Hall (2001). The modern approach assumed complete vertical integration between the producers and other Stores/consumers (Amstrong, 2006). Intermediaries connected buyers and sellers and provided price discovery, certification, advertising and other informational services, assuming full control over the transactions (Bayer 2001). They were therefore important because they enabled small-scale farmers to access the market in urban and other centers where the produce was required.

Intermediaries' reduced search and/or transaction costs and the "technologies" enabled them to do so at a reduced cost (Parker & Van Alstyne, 2008). However their incentives with respect to search effectiveness were fundamentally driven by the structure of the revenues they derived from the parties they served (Biglaiser, 1993). The small dairy farming producers lacked the

access, means and equipment needed in dairy farming industry and could succumb to none profitable dealings especially when milk supply was higher than market.

According to Spulber (1999), Intermediation theory was composed of other subsidiary theories such as: Neoclassical theory that portrayed small producers' enterprises strategies as market-takers because they were small firms compared to the size of whole economy (large number of firms in the industry). Industrial Organization theories assumed big firms' strategies as market-makers because of their market power of the industry and their market strategic position. Contractual theories focused on transactional costs within traditional trading relationships. Transaction costs were costs not directly related to production, but arose as agents interacted with each other and coordination of their actions (Williamson, 1985). They chose firm boundaries where market transactions exceeded organizational costs.

Baye and Morgan (2001) pointed the obstacles associated with extracting surplus funds from consumers and producers due to price externalities in the context of a price search engine. Ellison and Ellison (2009) suggested that some price search friction might raise retailers' prices and profits which could extinct small producers. Vickers and Zhou (2009) mentioned the possibility that an intermediary distorted the search process so as to induce prominence when its revenue came solely from sellers.

Therefore these intermediaries' models viewed intermediaries as market makers coordinating the actions of small milk producers and other small firms. On the other hand, the small producers became market takers. The small producers were therefore eliminated in decisions that affected their SSDF such as price of milk, cost of input supplied depending upon abundance of milk and sale costs faced by the milk producer (Rayo & Segal 2009). The small milk producers were more vulnerable because they could not store their produce until a time of scarcity due to lack of equipment and technology that could bring value addition to their products.

2.6.2 Resource Dependency Theory (RDT)

Resource Dependency Theory (RDT) was advanced by Emerson (Emerson & Richard, 1962). The theory advocated that dependency emanated from agreements made by sellers and buyers in the process of exchange of product for money. Each party could facilitate or hinder the satisfaction of the other's resource needs and wants. Either party enjoyed exchange power based

on the degree of dependence experienced by the other. The producers' power stemmed from quality and scarcity of the product while buyer's power was derived from their own resources and freedom to obtain resources from other sellers (Ramsay, 1996).

RDT indicated that those organizations that depended on other organizations for resources were controlled by those organizations on which they were dependent on. In such process of dependency, the strategies' of dependent organizations were regulated by the organizations on which they depended upon (Pfeffer & Salancik, 1978). Small organizations could not be self-dependent and autonomous, they had to depend upon other organizations for varied reasons such as transport, storage and further product processes. Under those circumstances, the dependent organizations found their dependency upon other organizations dominating market decisions resulting in unfair business deals. In order to get rid of the control of the other organizations on which the dependent organizations relied on, the government and other stakeholders could intervene either in providing the resources or moderating the dependency (Pfeffer & Salancik, 1978). This was relevant to SSDF as they depended on milk intermediaries for transport, storage and further product processes.

Resources included money, materials, personnel, information and technology. All these resources were important ingredients of organizational resources so that all organizations needed to effectively function. If organizations lacked any of those resources, they had to effectively interact with others who control those resources (Pugh & Hickson, 1997). Pfeffer and Salancik (1978) suggested that interdependence with other lied in the availability of resources and the demand for them. This interdependence might take the form of direct dependence of the seller organization on the buyers of their products or on potential sellers for whom they compete (Pugh & Hickson, 1997).

The small milk producers industries depended on big firms such as KCC and other intermediaries to provide these resources on a daily basis as their products were perishable which were produced in small quantities making it uneconomical to reach consumers in urban centers and others. According to Pfeffer and Salancik, (1978) three conditions caused the dependency.

- The f*irst* condition was the importance of resource to the seller organization which was determined by the demand and the supply of resources and the consequence if resources needed were not available.

- The *second* condition was how much discretion those who controlled a resource had over its allocation of use. This condition also suggested that those in control and had access to a resource could make the rules about it and those organizations that needed them could be put in a highly dependent position.

- The *third* condition was the degree to which those who controlled a resource enjoyed a monopoly. Whether an organization that needed resources had an alternative source or substitute was also vitally important (Ellram, 1991).

These conditions explained the vulnerability of milk producers in rural areas where their survival depended on external resources provided by milk intermediaries.

If producers felt vulnerable as a result of this relative dependence, they might have responded in ways that undermined trust and commitment, which formed the foundation of supply chain management (Joshi, 1998). Cox (2001) suggested power matrix as a different way to understand power of buyers and suppliers. The power matrix was basically constructed around the idea that all buyers and sellers relationships were predicted on the relative utility and the relative scarcity of the resources that were exchanged between the two parties (Cox et al., 2000). These phenomena might have caused SSDF to exit their businesses to pave way for other farming activities that were likely to earn them profits causing scarcity of milk products in the market.

RDT explained the ways to manage dependence by establishing inter-organizational relationship. A basic premise for resource dependency theory was that firms which were confronted with external dependency would try to establish inter-organizational arrangements as strategic responses to actors in their external environment (e.g. suppliers). One implication of resource dependency theory for the organization of inter-firm relationship was that firms facing different dependency condition would structure their relations to exchange partners in as favorable manner

as possible (Buvik, 2001). They were likely to form societies to help them acquire economy of scale in their businesses activities. The small-scale dairy farmers could be assisted to form trading groups in their dairy farming SSDF to mitigate dependency on intermediaries firms that might be influencing negatively their sustainability SSDF.

These theories were used to establish influence of milk intermediaries' purchasing strategies on sustainability of SSDF in order to suggest ways that could help to mitigate factors that might have been hindering these businesses from flourishing.

2.7 Conceptual framework

The conceptual framework figure 2 showed a relationship between various variables of the study. Tlhe milk intermediaries purchasing strategies (independent variables) influenced the sustainability of SSDF (dependent variable). The moderating variables were goverment polices implemented by Kenya Dairy Board (KDB) reduced the intensity of influnce that the independence variables had over the dependent variables. The intervening variables were dairy breed, feeds and feeding level, diseases and pest which also influenced the dependant variables. The extraneous variables were drought which influenced both independent and dependant variables but were beyond human control. All these variables influenced sustainability of SSDF.

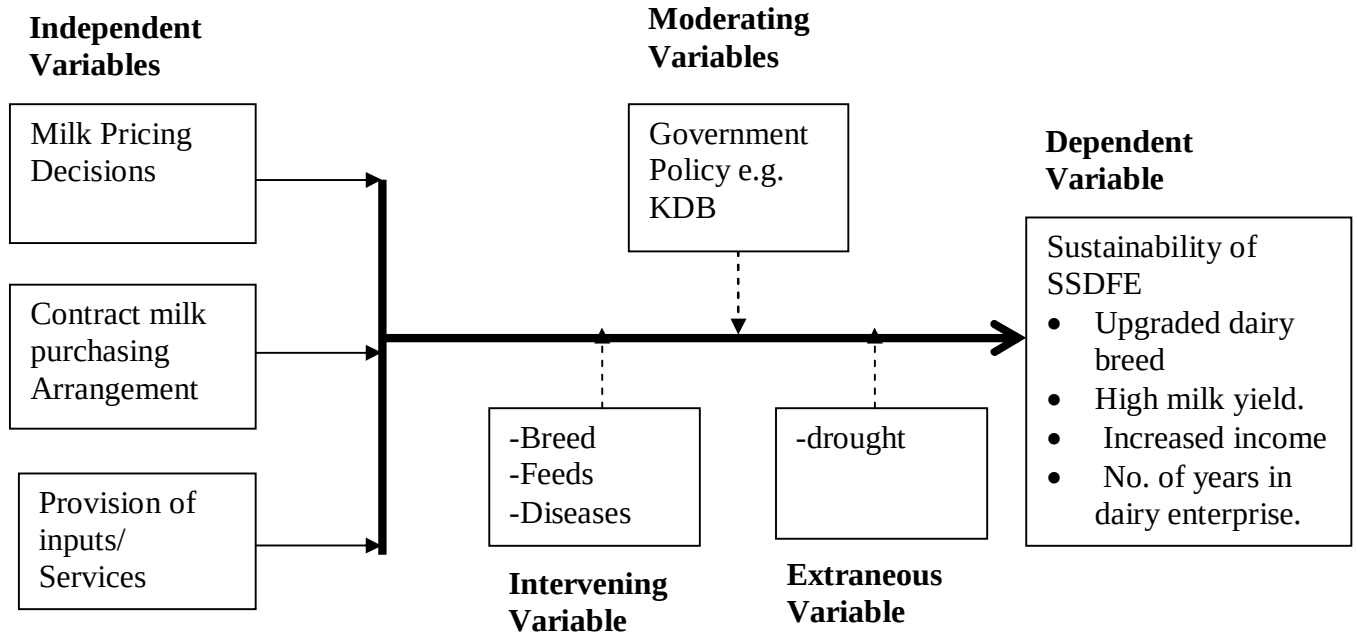


Figure 2: Conceptual Framework

The conceptual framework showed how the intermediaries' milk purchasing strategies e.g. milk pricing, contractual milk purchasing arrangements and provision of inputs/services to a great extent influenced sustainability of SSDF. The pricing decision is based on quantity and market available. The intermediaries possessed necessary resources needed in milk industry such as cooling storage, transport etc which could be lacking in SSDF. The small-scale dairy farmer received dairy farming inputs such as feeds and drugs for their cows to be paid for after milk sale at specific price regardless of market prices. All services were pegged on small-scale dairy farmer ability to supply milk.

The contracts entered made producers to be price takers. Such deals tended to disadvantage one party due to the vulnerability of his position. These strategies were practiced by milk purchasing intermediaries who included co-operatives, hotels/ milk kiosks, private diaries and hawkers/middlemen.

2.8 Summary to the Chapter

The chapter reviewed literature on milk intermediaries in order to demonstrate how their milk purchasing strategies could influence the sustainability of SSDF. The chapter also reviewed Independent variables of the study which were-; milk pricing methods, contractual milk purchasing agreement and Provisions of inputs/services while dependent variable was sustainability of SSDF. Theoretical framework which included market intermediation theory and resource intermediation theory were covered. The chapter also illustrated conceptual framework on variables.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed the research design of the study, the site of the study, Target population, Sampling procedure and Sample Size, Methods of data collection, Pilot Testing of the Instrument, Validity and Reliability, Data Collection Procedure, Operational Defination of Variables, Methods of data analysis and the summary of this chapter.

3.2 Research Design

In this study, descriptive survey design was used to explain relationship between independent variable and dependent variable and showed how independent variables influenced the dependent variables (Nachmias & Nachmias 2008). The study focused on describing state of affairs of milk intermediaries already existing in the field as perceived by small-scale dairy farmers in order to gain a deeper understanding of how milk intermediaries influenced SSDF. Using this design, the data collected helped to establish the extent to which milk intermediaries'purchasing strategies influenced sustainability of SSDF in Manyatta Constituency, Embu County.

3.3 The Site of the Study

The study was carried out in Manyatta Constituency. This constituency was one of the four constituencies of Embu County. It was the most agriculturally productive land in County and out numbered the rest in dairy farming(PDLP 2011). It was made up of two districts namely Embu West and Embu North that were curved from the former Embu District. It comprised of three administrative divisions namely Central, Nembure and Manyatta Division. This study would use administrative divisions as study zones as a basis of data collection in order to capture data from all quarters in the constituency where the participants were positioned.

3.4 Target Population

This study focused on small-scale dairy farmers with 1-5 dairy cows within Manyatta Constituency and milk intermediaries. For inclusion in this study, the farmers' had to be involved in the sale of milk at the moment of study or six months before and intermediaries must be involved in buying milk directly from small-scale dairy farmers. According to (PDLP 2011)

annual report, there were about 16,200 small-scale dairy farmers and 27 milk intermediaries involved in small-scale milk trade in Manyatta contituency. Therefore target population was 16200 Small-Scale Dairy Farmers and 27 milk intermediaries formed secondary respondents of the study.

3.5 Sampling Design and Procedure

This study used both stratified random sampling and purposive sampling techniques to draw sample size from the target population. The former sampling procedure was chosen because it enabled the researcher to subdivide the constituency under study into three regions along administrative divisional boundaries in order to draw a representative sample of small –scale dairy farmers from all the divisions in the constituency. The researcher drew the respondents from sample frames of dairy farmers that met study specifications. These frames were available in Central, Manyatta and Nembure Divisional Livestock offices. The latter sampling procedure was used to select one respondent (manager) from` each milk intermediaries' enterprise that bought milk direct from small-scale dairy farmers. Number of various intermediaries in Manyatta constituency according to Annual report (PDLP, 2011) were as follows: five dairy co-operative societies, three private dairies, seven milk hawkers and twelve milk bars. Hence the researcher studied 27 milk intermediaries representing all milk intermediaries in the constituency.

The researcher used a simplified formula which was developed by Glein (1992) to determine the sample size of big populations such as small scale dairy farmers. The formula enabled researcher to get a sample size with 95% confidence level, allowing for an error tolerance margin of 0.05% of the target population. The formula is:-

$n=N/(1+N(e)^2)$

Where n = Sample Size

e = Level of Precision

N = Population size

The researcher used the above formular to calculate the sample size as shown below:

$n = 16200 \div (1+16200(0.05)^2)$

$= 16200 \div 41.5$

= 390 small scale dairy farmers was studied. Hence 130 small scalle dairy farmers were chosen from earch of the three administrive divisions in Manyatta constituency.

Therefore 390 small-scale dairy farmers were studied and 27 milk intermediaries formed secondary sample size for the study.

3.6 Methods of Data Collection

The research instrument was questionnaire for Small-scale dairy farmers and milk intermediaries. This was appropriate instrument since it presented an even stimulus potential information to respondents and provided the investigator with an easy accumulation of data. The instrument comprised of structured and unstructured questions. The questionnaire was generated from reviewed literature and the questions structure was adopted and modified from Haore (2007).

3.7 Data Collection Procedure

The researcher was assisted by six research assistants; two per division to carry out the instrumentation. A day's induction course was conducted to familiarize the research assistants with the nature and modalities of the assignment. This included the aim and relevance of the study, and the instructions on completing the instrument (Patton, 2002). The researcher and the assistants administered the data collection instrument in person.

3.8 Pilot Testing of Instruments

The researcher conducted a pilot study on 10 small-scale dairy farmers in a neighbouring constituency in Embu East District. This allowed the researcher to make meaningful observations and identify vague questions, deficiencies in questions, test the survey techniques and suitability of the proposed analysis as supported by Mugenda and Mugenda, (1999). This helped to ensure effectiveness of the questionnaire in capturing and measuring the variables of the study. The instruments were revised according to the outcome of the pilot study.

3.9 Validity of the Instruments

Construct validity was established by ensuring that the contents of the instrument measured the specific intended domain of the phenomena under investigation. The literature reviewed revealed that SSDF were influenced by milk intermediaries' purchasing strategies in terms of milk price, contract milk purchasing arrangement and provision of dairy farming inputs and services. To achieve this, the researcher ensured that measurement items conformed to the literature reviwed in this study in line with Kothari, (2004). To ensure content related validity, all the elements from the sample were drawn from survey sites in the two district and data collecting instrument was structured to ensure that data collected was correlated.

3.10 Reliability of the Instrument

The reliability of the research instrument was ascertained through split half methods where sampled group of 10 small-scale dairy farmers were selected before the actual administration of questionnaires. After the ten farmers filled their questionnaires, the questionnaires were divided into two halves. An internal analysis coefficient score for each half was obtained by use of SPSS. These scores were then correlated using the correlation coefficient and a correlation of 0.75 was found. This meant that the instrument was reliable because 0.75 indicated a strong positive relationship.

3.11 Operationalization of variables

Table 3.1: Operationalization of variables

	OBJECTIVES	VARIABLES	INDICATORS	MEASUREMENT	SCALE
1.	To establish how milk pricing decisions by intermediaries influences sustainability of SSDF	**Independent** Milk pricing decisions	-Increased income (money) -Stable prices	Money per unit of milk	Ordinal
2.	To establish how contract milk purchasing arrangement influence the sustainability of SSDF.	**Independent** contract milk purchasing arrangement	Certificate of contract agreement	No. of SSDF dairy farmers selling milk on contract.	Ordinal
3.	To examine the extent to which provision of inputs/ services by intermediaries to small-scale dairy farmer influence sustainability of SSDF	**Independent** Provision of inputs/ services	-Dairy farming feeds -AI services -Trainings/advice -Disease control	-No. of bags -No. of AI services -No. of trainings -No. of cows treated	Ordinal ordinal ordinal
4	To establish the influence of milk intermediaries purchasing strategies on SSDF	**Dependent** Sustainability of SSDF	-Improved dairy breeds -Increase milk yield -Increase income	-No. of improved dairy cows -Amount of milk in litres -Amount of money	Ordinal ordinal ordinal

3.12 Methods of Data Analysis

The research used quantitative methods to analyse data. Questionnaires were checked for completeness and consistency then coded to enable the responses be categorized. Frequency distribution and percentages were generated using descriptive statistics in order to examine the pattern of responses. To analyze relationship between variables correlation coefficient was used. Microsoft Exel Computer Package was used for speedy and effecient analysis. The findings were presented in form of tables of frequencies and percentages. The analysis was used to draw

conclusions and recommendations to establish the influence of milk intermediaries' purchasing strategies on the sustainability of SSDF in Manyatta Constituency.

3.13 Ethical Considerations

The researcher and his assistants briefed the respondents about the study before recruiting them to participate in the study. The decision to participate in the study was on voluntary basis and no coercion was applied. Respondents were not required to write their names on the questionnaire in order to observe their confidentiality. Permission to access respondents was sought from the District Commissioners in Embu West and Embu North. In addition, permission was sought from District Livestock Production Officers in Embu West and Embu North districts.

3.14 Summary to the Chapter

The chapter explains how the research design, site of study, target population, sampling design and sample size were conducted. It also show how the data collection methods and tools were used and how validity and reliability was ascertained and how the data collected was analysed.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter provided the results of the study as proposed in the research methodology. The chapter presents data analysis which means categorizing, ordering, manipulating and summarizing of data to intelligible and interpretable form using statistics. The presentations of the findings in this research were done using frequency tables and percentages and discussions on the findings were made in line with the objectives of the study.

4.2 Questionnaires Return Rate

This study administered 390 questionnaires to small-scale dairy farmers (primary respondents) and 27 questionnaires to milk intermediaries (secondary respondents). Return rate of 100% was realized from all respondents which was a good return rate.

4.3.1 Gender of respondent

The study sought to determine the characteristics of the primary respondents on their gender. The respondents were required to indicate their sex and the finding were tabulated in Table 4.1

Table 4.1: Distribution of the Respondents by Gender

Gender	**Frequency (n)**	**Percentage** %
Male	156	40
Female	234	60
Total	**390**	**100**

Table 4.1 findings revealed that there was more females (60%) respondent than males (40%). This showed that more women are involved in SSDF than men. This was attributed to the fact that women engaged in dairy farming while their husband sought paid jobs to supplement their daily income.

4.3.2 Respondent Age

The primary respondents were requested to indicate their age and the results were recorded in Table 4.2

Table 4.2: Age of respondents

Age cluster	Frequency (n)	Percentage %
18-35	60	15.4
36-53	197	50.5
54 and above	133	34.1
Total	**390**	**100**

Table 4.2 revealed that most of the small-scale dairy farmers (50.5%) were in age brackets of 36-53 years.. A few youth own land and majority were deemed to be pursuing education at college levels hence low youth respondent (15.4)

4.3.3 Number of Dairy Cows owned by Small-Scale Dairy Farmers

The study sought to establish the number of dairy cows kept by small-scale dairy farmers in order to establish sustainability of dairy farming. The findings were tabulated in table 4.3

Table 4.3: Number of Dairy Cow

Number of dairy cows	Frequency (n)	Percentage %
1	47	12.1
2	113	30.0
3	144	36.9
4	52	13.3
5	34	8.7
Total	**390**	**100**

Table 4.3 revealed that most of small-scale dairy farmers kept 3 dairy cows (36.9%) and 2 dairy cows (30%). This is an indicator that a SSDF can sustain 2-3 dairy cows. This was attributed to land factors and availability of resources/inputs needed in dairy farming.

4.3.4. Number of Years in Dairy Farming

The researcher wanted to establish the number of years the primary respondent had been practicing dairy farming in order to establish sustainability of SSDF. These findings were displayed in Table 4.4.

Table 4.4: Number of Years In Dairy Farming

Years of dairy farming	Frequency **(n)**	Percentage %
6 months	2	0.5
1 years	16	4.1
2 years	23	5.9
3 years	31	8.0
Over 4 years	318	81.5
Total	**390**	**100**

Findings tabulated in Table 4.4 showed that 81.5% small-scale dairy farmers had been in dairy farming for over 4years. This is an indication that dairy farming is sustainable because of varied products derived from it for example manure, capital investment and milk for the family beside income obtained from milk.

4.3.5 Sustainability of SSDF

The study sought to know whether the SSDF were able to sustain themselves. The findings were displayed in table 4.5.

Table 4.5: Sustainability of SSDF

Does the SSDF sustain itself?	**Frequency (n)**	**Percentage** %
Yes	364	93.3
Not sure	26	6.7
Total	**390**	**100**

The finding in table 4.5 indicated that majority of small-scale dairy farmers (93.3) were able to sustain their SSDF while 6.7% were not sure. This was attributed to varied products derived

from it for example manure, capital investment and milk for the family beside income obtained from milk.

4.4 Milk Pricing Strategies and Sustainability of SSDF

The primary respondents were requested to give information on milk intermediaries who buy their milk, their involvement in milk pricing, distribution of intermediaries in the constituency, price of milk per litre and duration of milk payment by intermediaries. The findings were recorded in the Tables 4.6, Table 4.7, Table 4.8, 4.9, and 4.10 respectively.

4.4.1 Milk intermediaries who buy milk from small-scale dairy farmers.

The primary respondents were requested to indicate intermediaries who bought their milk. Finding were tabulated in table 4.6,

Table 4.6: Milk intermediaries

Milk intermediaries	Frequency (n)	Percentage %
Hawkers/ middlemen	132	33.9
Hotel/ kiosk	101	25.9
Co-operative/SHG	128	32.8
Private dairies	29	7.4
Total	**390**	**100**

Table 4.6 findings established that most of small-scale dairy farmers sell milk to hawker/middlemen (33.9%) and co-operatives/SHG (32.8%). This was attributed to services/inputs derived from buyers such as transport as such cost would impact negatively on small-scale dairy farmer who sell limited amount of milk on daily basis as the product could not be stored to accumulate due to lack of storage facilities.

4.4.2; Distribution of Milk Intermediaries in the Constituency

The study established the distribution of milk intermediaries in the Constituency. The findings were displayed in table 4.7.

Table 4.7: Distribution of milk intermediary in the Constituency

Milk Intermediary	Central Division	Manyatta Division	Nembure Division	Total
Cooperative societies	0	2	3	5(18.5%)
Private diaries	2	1	0	3(11.1%)
Middlemen/Hawker	3	3	1	7(25.9%)
Kiosk/hotel	6	4	2	12(44.5%)
Total	11(40.7%)	10(37.1%)	6(22.2%)	27(100%)

Table 4.7 revealed that 44.5% were kiosks/hotel/milk bars, 25.9% were middlemen/hawkers, and 18.5% were co-operative societies while 11.1% were private diaries. The results indicated lack of some types of milk intermediaries for example there was no co-operative society in central Division, and no private diaries in Nembure Division which might had an implication to milk pricing.

4.4.2 Milk Prices offered to farmers by Milk Intermediaries

The researcher sought to establish the milk prices offered to SSDF by Milk intermediaries. The results were displayed in Table 4.8.

Table 4.8: Milk Prices offered by Intermediaries to SSDF

Milk Intermediaries	Mean Price Ksh. Per Litre
Hawkers/ middlemen	33.2
Hotel/ kiosk	32.0
Co-operative/SHG	30.0
Private dairies	32.6
Combined mean	**32.0**

Table 4.8 revealed that middlemen purchased milk from small-scale dairy farmers at ksh. 33.2, per litre while co-operative societies bought at ksh.30.0 which was the lowest price. However the combined mean buying price from all milk intermediaries was ksh. 32.0. This was attributed to the fact that Dairy Co-operative Societies set the base price upon which other milk intermediaries set their milk prices.

4.4.3 Involvement of Small-Scale Dairy Farmers in Pricing Decision

The primary respondents were requested to indicate their involvement in pricing decisions of their milk. This data was recorded in the table 4.9.

Table 4.9: Involvements of Small-Scale Dairy Farmers in Pricing Decision

Involvement in Milk Pricing	**Frequency (n)**	**Percentage** %
Involved in pricing decisions	115	29.5
Not Involved in pricing decisions	275	70.5
Total	**390**	**100**

According table 4.9 findings, 70.5% small-scale dairy farmers were not involved in deciding price of their milk while 29.5% were involved. This meant that most of milk intermediaries did not involve small scale dairy farmers in milk pricing decisions. This was attributed to monopolistic way of doing business where limited market channels and provision of services/inputs caused SSDF to be price takers.

4.4.4. Duration of Milk Payment by Intermediaries

The study wanted to establish the duration taken by intermediaries before they pay for the milk sold to them. These data was sought from both the primary and secondary respondents respectively as tabulated in tables 4.10 and 4.11 respectively.

Table 4.10: Duration of Payment (primary respondents)

Payment duration	**Frequency (n)**	**Percentage** %
Monthly	153	39.2
Weekly	127	32.6
Fortnight	71	18.2
Within one day	37	10.0
Total	**390**	**100**

Table 4.10 findings revealed that majority of small-scale dairy farmers received milk payment monthly (38.7%) and weekly (32.6) from milk intermediaries.

Table 4. 11: Duration of Payment

Type of milk intermediary	Daily /instant	Weekly	2 weeks	Monthly	Total
Cooperative societies	0	0	0	5	5
Private diaries	0	0	0	3	3
Middlemen/hawker	1	0	3	3	7
Kiosk/hotel/milk bar	3	7	1	1	12
Total	4(14.8%)	7(25.9%)	4(14.8%)	12(44.5%)	27(100%)

This was confirmed by Table 4.11 that revealed that majority of milk intermediaries (44.5%) paid milk on monthly basis and 25.9% on weekly basis. These results were interpreted to be caused by time taken by the milk intermediaries to sell the same milk to consumers/other intermediaries.

4.4.5 Effects of Milk Pricing Decision on Small Scale Dairy Farmers

The primary respondents were requested to indicate how they were affected by milk pricing decisions. Results were recorded in table 4.12.

Table 4.12: Effects of Milk Pricing Decision on Small Scale Dairy Farmers

Pricing decision effect	Frequency (n)	Percentage %
Negative	**343**	**87.9**
No effect	**47**	**22.1**
Total	**390**	**100**

Table 4.12 revealed that most small-scale dairy farmers (87.9%) were affected negatively by milk pricing decisions. Therefore small-scale dairy farmers were not satisfied with prices offered by milk intermediaries because they did not realize much profit after subtracting expenses incurred.

4.4.6 Correlation between Milk Pricing and Sustainability of SSDF

The study sought to establish whether there was a relationship between milk-pricing strategies by milk intermediaries and sustainability of SSDF. The results were tabulated in table 4.13.

Table 4.13: Correlation between Milk Pricing and Sustainability of SSDF

Milk Pricing	%	Sustainability of SSDF	%	Correlation coefficient
Involved	28.5	Yes	93.3	
Not involved	70.5	Not sure	6.7	-1

Table 4.13 showed that there was negative correlation Co-efficient (-1) between milk pricing strategies and sustainability of SSDF. This data revealed that milk pricing strategies by milk intermediaries influenced sustainability of SSDF negatively.

4.5 Contract Milk Purchasing and Sustainability of SSDF

The study sought to know whether the respondents sold milk on contract basis, reasons for entering into those contracts, whether contracts were written or verbal and constraints encountered in formulation of those contracts. The findings were recorded in table 4.14, 4.15, 4.16 and 4.17 respectively.

4.5.1 Sell of Milk on Contract Basis

The small-scale dairy farmers were requested to indicate whether they sold their milk to intermediaries on contract basis. Data was also sought from secondary respondents to ascertain if they purchased milk on contract basis from SSDF. The findings are recorded in tables 4.14 and 4.15 respectively:

Table 4.14: Selling Milk on Contract by small-scale dairy farmers

Sell of Milk on Contract Basis?	Frequency (n)	Percentage %
Yes	129	33.1
No	161	66.9
Total	**390**	**100**

Table 4.14 established that 66.9% of small-scale dairy farmers did not sell milk to intermediaries on contract basis while 33.1% sold milk on contract basis.

Table 4.15: Milk Intermediaries who Purchased milk on contract

Type of milk intermediary	Yes	No	Total
Cooperative societies	3	2	5
Private diaries	0	3	3
Hawker/middlemen	3	4	7
Kiosk/hotel/milk bar	5	7	12
Total	**11(40.7%)**	**16(57.3%)**	**27(100%)**

Table 4.15 revealed that 57% respondents did not purchase milk on contract while 40.7% purchased milk on contract basis. The two tables confirmed that most of SSDF do not sell their milk on contract basis. This might have been caused by lack of knowledge on benefits accrued from contractual milk selling by majority of small-scale dairy farmers.

4.5.2 Type of Contract

The respondents were requested to indicate the type of contract they used to sell milk to milk intermediaries. Results of Primary and Secondary respondents are tabulated in table 4.16 and 4.17 respectively.

Table 4.16: Type of Contract (primary respondents)

Type of contract	Frequency (n)	Percentage
Written	43	33.3
Verbal	86	66.7
Total	**129**	**100**

Table 4.16 revealed that 66.7% of small-scale dairy farmers sold milk to intermediaries on verbal contract basis while 33.3% had written contracts.

Table 4.17: Type of Contract (secondary respondents)

Type of milk intermediary	Written	Verbal	Total
Cooperative societies	1	2	3
Private diaries	0	0	0
Hawker/middlemen	0	3	3
Kiosk/hotel/milk bar	0	5	5
Total	**1(9.1%)**	**10(90.9%)**	**11(100%)**

Table 4.17 revealed that 90.9% of contracts made between milk intermediaries and small-scale dairy farmers were verbal while 9.1% were written. This confirmed findings by primary respondents in table 4.16. Co-operative societies were the only intermediaries that engaged in written contracts. These results reflected that verbal contracts were made on mutual trust hence not legally binding.

4.5.3 Reason for Selling Milk on Contract Basis

The study sought to establish the main reasons that caused respondents to sell/purchase milk on contract basis. Data was collected from both the primary and secondary respondents as tabulated in tables 4.18 and 4.19 respectively.

Table 4.18: Reasons for Selling Milk on Contract Basis

Reasons for going for contract	Frequency (n)	Percentage %
Reliable milk market	79	61.2
Provision of inputs/ services	25	19.4
Fluctuation of milk prices	19	14.7
Prices	6	4.7
Total	**129**	**100**

Findings in table 4.18 revealed that reliable milk market (61.2%) was the main reason why majority of small-scale dairy farmers sold their milk on contract basis. 19.4% of respondents entered into contract in order to procure Provision of inputs/ services while 14.7% respondents entered in contract to control fluctuation of milk prices offered by milk intermediaries.

Table 4.19: Reasons for Buying Milk on Contract Basis

Type of milk intermediary	Reliable milk supply	Milk price fluctuations	Total
Cooperative societies	2	1	3
Private diaries	0	0	0
Hawker/middlemen	3	0	3
Kiosk/hotel/milk bars	5	0	5
Total	10(90.9%)	1(9.1%)	11(100%)

Table 4.19 revealed that 90.9% of secondary respondents got into contract milk buying with small-scale dairy farmers in order to have reliable milk supply while 9.1% respondents needed to control milk price fluctuations. This results confirmed reasons given by small-scale dairy farmers in table 4.17. Therefore reliable milk market and reliable milk supply are important factors in SSDF.

4.5.4 Constraints of Selling Milk on Contract Basis

The small-scale dairy farmers were requested to give main constrains they faced when selling milk to milk intermediaries on contract basis. The results of these findings are tabulated in tables 4.20.

Table 4.20: Constraints of Selling Milk on Contract Basis

Constraints from contract	Frequency (n)	Percentage %
Not flexible to address price changes	86	66.7
Not legally enforceable	28	21.7
Not informed on law of contract	12	9.3
(Others) Risky	3	2.3
Total	**129**	**100**

Findings tabulated in Table 4.20 showed that 66.7% respondent indicated that the main constraint they encountered while selling their milk on contracts basis, was lack of flexibility in contracts to address price changes emanating from type of contracts entered with milk intermediaries.

4.5.5 Correlation between Contract Milk Purchasing and Sustainability of SSDF

The study sought to establish whether there was a relationship between contract milk purchasing arrangement by milk intermediaries and sustainability of SSDF. The results were displayed in table 4.21

Table 4.21 Correlation between Contract Milk Purchasing and Sustainability of SSDF

Contract milk purchasing	%	Sustainability of SSDF	%	Correlation coefficient
Contract Basis	33.1	Yes	93.3	
Not on contract	66.9	Not sure	6.7	-0.97

Table 4.21 indicated that Contract milk purchasing arrangement by milk intermediaries had strong negative correlation coefficient (-0.97). This showed that those small-scale dairy farmers who did not sell milk on contract basis could not sustain their SSDF for long.

4.6 Provision of Input/services and sustainability of SSDF

The researcher wanted to establish the extent to which provision of inputs/services by milk intermediaries to SSDF influenced sustainability of those SSDF. Inputs/services examined were: Source of advice on dairy cow management; Source of Artificial Insemination Inseminators, Sources of dairy farming inputs/services and Pests' control and Treatment of Cow diseases as recorded in table 4.22, 4.23, 4.24, 4.25 and 4.26 respectively

4.6.1 Source of Advice on Management of Dairy Cows.

Small-scale dairy farmers were asked to indicate where they got advice on dairy cattle management. The findings are tabulated in Table 4.22.

Table 4.22: Source of Advice on Dairy Cow Management

Source of advice on Management of Dairy Cows	Frequency (n)	Percentage %
Livestock Production Extension officers	311	79.7
Milk intermediaries	37	9.5
Others -: Other farmers	24	6.2
Agro-vet dealers	13	3.3
Catholic Diocese of Embu	5	1.3
Total	**390**	**100**

Table 4.22 findings indicated that majority of respondents' got advice on management of dairy cows from Livestock Production Extension officers (79.7%) while milk intermediaries provided 9,5% of advice given.10.8% receive advice from other service providers This meant that livestock Production department provided most advisory services on dairy cattle management to primary respondents through extension officers.

4.6.2: Source of Artificial Insemination (A.I).

The study sought to establish where the respondents sourced inseminator of their dairy cows. The findings were tabulated in table 4.23.

Table 4.23: Source of Artificial Inseminator (A.I).

Source of AI services	**Frequency (n)**	**Percentage** %
Private AI practitioners	365	93.6
Co-operative society/ organization	22	5.6
Others -: Catholic Diocese of Embu	3	0.8
Total	**390**	**100**

Table 4.23 established that majority of primary respondents' sourced Artificial Insemination services from Private AI practitioners (93.6%). This revealed that most of milk intermediaries did not offer AI services to small-scale dairy farmers. This had negatively affected sustainability of SSDF due to cost charged.

4.6.3 Cows Pests Control and Treatment of their Diseases

The study wanted to establish who attended to respondents' cows with regards to pests control and treatment of diseases. The results were tabulated in table 4.24.

Table 4.24: Cows' Pests Control and Treatment of Disease

Cows' Pests Control and Treatment of Diseases	**Frequency (n)**	**Percentage** %
Private Animal Health Practitioners	307	78.7
Vetinary Services	59	15.1
Co-operative Societies' Staff	24	6.2
Total	**390**	**100**

Table 4.24 findings revealed that 78.7% of primary respondents consulted Private Animal Health Practitioners who controlled cows' pests and treated their diseases. Co-operative societies only provided 6.5% of those services to the primary respondents. These results were attributed to sparse spread of co-operative societies in the constituency and the fact that dairy co-operative societies provided inputs/services to dairy farmers who were their members.

4.6.4 Source of Inputs for Dairy Cows

The primary respondents were requested to indicate where they got dairy inputs to sustain their dairy cows. Data was also sought from secondary respondents on provision of dairy inputs/services to SSDF. The results of these findings are tabulated in Tables 4.25 and 4.26 respectively.

Table 4.25: Source of inputs for Primary Respondents

Source of inputs	Frequency (n)	Percentage %
Private Agro-vet shop	314	80.5
Co-operative society/ organization	76	20.5
Total	**390**	**100**

From the Table 4.25, this study established that 80.5% of the primary respondents sourced dairy inputs from Private Agro-vet shop, while 20.5% sourced from Co-operative society/ organization. These results were attributed to uneven spread of co-operative societies in the constituency.

Table 4.26: Provision of Dairy Farming Inputs to SSDF

Type of milk intermediary	Yes	No	Total
Cooperative societies	4	1	5
Private diaries	0	0	0
Hawkers/middlemen	2	5	7
Kiosk/hotel/milk bars		12	12
Total	6(25%)	18(75%)	24(100%)

Table 4.26 revealed that most milk intermediaries (75%) did not provide farming inputs/services to primary respondents while 25% did. However most co-operative societies offered inputs/services to SSDF though they were few and unevenly spread in the constituency.

4.6.5. Constraints in Procuring Inputs/ Services

The primary respondents were requested to indicate constraints they encountered in procuring inputs/ services for their dairy farming SSDF. Procurement challenges were also affirmed by unwillingness of milk intermediaries to offer credit facilities to SSDF as tabulated in tables 4.27 and 4.28 respectively.

Table 4.27: Constraints in Procuring Inputs/ Services by Primary Respondents)

Constraint	**Frequency (n)**	**Percentage** %
High price	247	63.3
Delays in supply	54	13.9
Low quality	89	22.8
Total	**390**	**100**

Table 4.27 findings showed that high price (63.3%) was the main constraint experienced by respondents when procuring inputs/ services from milk intermediaries. These results were attributed to distant between dairy co-operatives societies and dairy farmers in addition to societies' uneven spread in the constituent that offer inputs/services at subside price

Table 4.28: Provision of Credits Facilities to SSDF

Type of milk intermediary	**Yes**	**No**	**Total**
Cooperative societies	3	2	5
Private diaries	1	2	3
Hawker/middlemen	2	5	7
Kiosk/hotel/milk bar	0	12	12
Total	**6(22.3%)**	**21(77.7%)**	**27(100%)**

Table 4.28 indicated that 77.7% of secondary respondents did not provide credit facilities to SSDF to enable them procure necessary dairy inputs/services. These results were attributed to low rate of written contract selling upon which provisions of credit could be arranged.

4.5.6 Correlation between Provisions of Input/services and Sustainability of SSDF

The study sought to examine the correlation Coefficient on provision of input/service and sustainability of SSDF. The results were tabulated in table 4.29.

Table 4.29: Correlation between Provisions of Input/services and Sustainability of SSDF

Provision of Input/services	%	Sustainability of SSDF	%	Correlation coefficient
Milk Intermediaries	20.5	Yes	93.3	
Others	80.5	Not sure	6.7	-1

The table 4.29 showed that there was negative correlation (-1) between provision of inputs/ service by milk intermediaries to small-scale dairy farmers and sustainability of SSDF. This revealed that provision of inputs/ service to small-scale dairy farmers influenced sustainability of SSDF negatively. However, those inputs/services on average 89.5% were offered by other providers not milk intermediaries. Therefore, inputs/services offered by milk intermediaries influenced sustainability of SSDF little.

4.7 Summary

This chapter presented the quantitative data analysis of the study using frequencies and percentages. Correlation coefficients of variables were also done. The findings were in line with the objectives of the study and revealed how: milk pricing by milk intermediaries influenced sustainability of SSDF; Contract milk purchasing arrangement influenced sustainability of SSDF and provision of Input/services by milk intermediaries influenced sustainability of SSDF.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, DISCUSSION OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction of the summary

This chapter contains a summary of findings as drawn from Chapter Four. It also discusses those findings against literature reviewed, makes conclusions and recommendations. Finally, the chapter suggests areas for further research.

5.2 Summary of the findings

The following were the key findings of the study;

5.2.1 Milk pricing and sustainability of SSDF

The researcher set out to establish how milk pricing strategies by milk intermediaries influenced sustainability of SSDF. The findings revealed that majority of small-scale dairy farmers (70.5%) were not involved in pricing decisions of their milk while 29.5% were involved. It also revealed that majority of Small-scale dairy farmers (87.9%) were influenced negatively by milk pricing decision. Therefore, small scale dairy farmers were not satisfied with prices offered by milk intermediaries. The study also revealed negative correlation co-efficient (-1) between milk pricing strategies by milk intermediaries and sustainability of SSDF. Those findings indicated that milk pricing strategies by milk intermediaries negatively influenced sustainability of SSDF.

5.2.2 Contract Milk Purchasing and Sustainability of SSDF

The study established that contract milk purchasing arrangement influenced sustainability of SSDF. Majority of small-scale dairy farmers (66.9%) did not sell milk to intermediaries on contract basis while 33.1% sold milk on contract basis. The findings also revealed that 57% of milk intermediaries' respondents did not purchase milk on contract while 40.7% purchased milk on contract basis. The two findings confirmed that most of SSDF do not sell their milk on contract basis.

The study also established that 66.6% of small-scale dairy farmers sold milk to intermediaries on verbal contract basis while 33.3% had written contracts. This was confirmed by milk intermediaries' respondents who revealed that 90.9% of contracts made between them and small-

scale dairy farmers on milk purchase were verbal while 9.1% were written. Co-operative societies were the only intermediaries that engaged in written contracts.

The study findings that the main reasons that propelled primary respondents to sell milk on contract basis was reliable milk market (61.2%) while 14.7% respondents entered in contract to control fluctuation of prices offered by milk intermediaries. It also revealed that 90.9% of milk intermediaries got into contract order to have reliable milk supply while 9.1% respondents needed to control milk price fluctuations. Therefore reliable milk market and reliable milk supply market are important factors in SSDF.

The study also established that there existed a correlation co-efficient between contract milk purchasing arrangement by milk intermediaries and sustainability of SSDF. Findings indicated that Contract milk purchasing arrangement by milk intermediaries had strong negative correlation coefficient (-0.97). This showed that those small-scale dairy farmers who did not sell milk on contract basis could likely not be able to sustain their SSDF for long.

5.2.3 Provision of inputs/services and sustainability of SSDF

The researcher established the extent to which provision of inputs/services by milk intermediaries to SSDF influenced sustainability of those SSDF. The findings revealed that majority of SSDF farmers got advice from Livestock Production Extension officers (79.7%) while milk intermediaries provided 9.5% advices only. This meant that livestock development department provided most advisory services on dairy cattle management to primary respondents through extension officers.

The study established SSDF sourced inseminator of their dairy cows from Private AI practitioners (93.6%). This revealed that most of milk intermediaries did not offer AI services to small-scale dairy farmers. This had negative effect on sustainability of SSDF due to cost charged.

The study findings revealed that 78.7% of primary respondents consulted Private Animal Health Practitioners who controlled cows' pests and treated their diseases. Co-operative societies only provided 6.5% of those services to the primary respondents

The study findings established that 80.5% of the primary respondents sourced dairy inputs from Private Agro-vet shop, while 20.5% sourced from Co-operative society/organization. These results were affirmed by secondary respondents' findings where 75% of milk intermediaries did not provide farming inputs/services to primary respondents while 25% did. However most co-operative societies offered inputs/services to SSDF though they were few and unevenly spread in the constituency.

The study established that there was negative correlation coefficient (-1) between services/inputs provisions by milk intermediaries to small-scale dairy farmers) and sustainability of SSDF. This revealed that provision of inputs/ service by milk intermediaries to small-scale dairy farmers influence sustainability of SSDF negatively. However, those inputs/services were mostly (89.5%) offered by other providers not milk intermediaries. Therefore provision of inputs/services by milk intermediaries did not influence sustainability of SSDF significantly.

5.3 Discussion of the findings

5.3.1 Milk pricing and sustainability of SSDF

The findings revealed that majority of small-scale dairy farmers 70.5% were not involved in pricing decisions of their milk while 29.5% were involved. It also revealed that majority of Small-scale dairy farmers (87.9%) were affected negatively by milk pricing decision. This was confirmed by Roy (2000) study in India where he found that cartelization by milk intermediaries led to monopolistic milk price setting, making small-scale dairy farmers' price takers.

Milk prices offered by the middlemen (Ksh33.2) were higher than those offered by cooperatives (Ksh30). This was confirmed by the study carried out on milk marketing in India, (Grover *et. al*., 1990 & NDDB-ORG, 2001) which revealed that prices offered by the informal sector were higher in areas where cooperatives were present, as an alternative channel. Thus, cooperatives often helped determine a floor price for milk. This concurred with Staal *et. al*., (1997) findings that spot sale for cash tended to be at higher unit price than sales where the producer only got paid a month later. There was a negative correlation (-1) between milk pricing strategies and sustainability of SSDF. This indicated that milk pricing strategies by milk intermediaries affected sustainability of SSDF negatively. This is because the farmers were not mainly involved in pricing decisions (70.5%).

5.3.2 Contractual milk purchasing arrangement and sustainability of SSDF

The study revealed that reliable milk market (61.2%) was the main reason why small-scale dairy farmers entered into contract with milk intermediaries. Those in contract (33.1%) were able to get dairy inputs/services from milk intermediaries. Hence they were able to sustain their dairy cattle and repaid inputs/services through deduction from milk sale. This is in line with study done by Ngigi, et al., (2000) in Kiambu which revealed that there was value in contractual milk selling as it provided reliable market to producers, especially when milk was plentiful on the market during the rainy season and producers faced the risk of not being able to sell a non-storable commodity.

The study revealed that majority of SSDF (66.7%) sold milk to intermediaries on verbal contract basis while only 33.3% sold on written contract basis. These findings concurred with those of a study carried out in Kiambu and Nyandurua district by Omore et al., (1999) which revealed that hawkers/middlemen disappeared with farmers' money where contracts were verbal. Contract milk purchasing arrangement by milk intermediaries had strong negative correlation coefficient (-0.97). This showed that those small-scale dairy farmers who were not selling milk on written contracts were not likely to sustain their SSDF for long.

5.3.3 Provision of inputs/services and sustainability of SSDF

The study revealed that majority of small-scale dairy farmers got dairy inputs/services from Private Agro-vet shop (80.5%) despite the high cost while only 19.5% got their daily inputs/services from daily co-operatives. This was in contrast with a study done in Kiambu and Nyandurua by Omore et al., (1999) which revealed that majority of Small Scale Dairy Farmers sourced their inputs/services from daily co-operatives. This contrast was attributed to sparse spread of daily co-operative societies in the Manyatta Constituency and the fact that those societies only availed inputs/services to their registered members. However those who were members of dairy co-operative societies were able to get inputs at fair prices and on credit basis to be repaid from monthly milk sales. This was confirmed by a study carried out in Nyandarua district by Omiti et al., (2000) which revealed that Dairy farming co-operatives significantly contributed to the development of the SSDF' milk marketing and provision of farm inputs and services at relatively lower costs.

5.4 CONCLUSION

The study revealed that pricing decisions by milk intermediaries affected small-scale dairy farmers negatively. This was because the farmers were not mainly involved in milk pricing decisions.

The findings also revealed that few farmers sold milk on contract basis which were verbal. However contractual milk selling provided reliable market to the small-scale dairy farmers despite the fact that prices were low. The study also revealed that majority of the small-scale dairy farmers acquired farm inputs and services from private agro vet shops and private service providers respectively despite the high cost. This was attributed to sparse distribution of co-operative societies in the constituency and the fact that cooperative societies only provided inputs/services to their registered members. Therefore the purchasing strategies of milk intermediaries influenced sustainability of SSDF negatively.

5.5 RECOMMENDATIONS

In view of the findings discussed in this study, the following recommendations were made;

1. The ministry of Livestock should encourage dialogue forums between small-scale dairy farmers and milk intermediaries when milk pricing decisions are made,

2. Farmers should be encouraged to sell milk on contractual basis which should be written. These contracts should be formalized through memorandum of understanding in order to protect the interests of both parties (seller and buyer).

3. The Ministry of Co-operative development should encourage farmers to form dairy co-operative societies to help them get dairy farm inputs/services at a fair price and on credit basis to boost the dairy farming SSDF.

5.6 RECOMMENDATIONS FOR FURTHER STUDIES

1. Another study should be done on other milk purchasing strategies practiced by milk intermediaries which influences SSDF.

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APPENDIXES

Appendix 1: Remittal Letters

Alvan Mugendi Gatumu
P O Box 327
RUNYENJES

1ST November 2012

The District Commissioner
Embu West District
P O Box
EMBU

The District Commissioner
Embu North District
P O Box 63
MANYATTA

Dear Sirs

REQUEST TO COLLECT DATA

I Gatumu Alvan Mugendi, Reg. No. L50/65481/2011, I am student in the School of Distance and Continuing Studies in the Department of Extra- Mural Studies, of University of Nairobi.

In pursuant to one of the pre-requisite of a Master degree in SSDF Planning and Management; I intend to conduct a research study on the influence of milk intermediaries' purchasing strategies on dairy farming small-scale' SSDF in Manyatta constituency. The main focus of my research study will be small-scale dairy farmers involved in milk production.

I kindly seek your approval and authority. I also would like you to introduce me to the officers under you like District Livestock Production Officers, chiefs and their assistants in order to enable me to reach the respondents under their work jurisdiction.

I, together with three research assistants intend to administer questionnaires to the small-scale dairy farmers at their respective homes.

Yours faithfully,

Gatumu Alvan Mugendi
ID/NO 8890914

Cc DLPO –EMBU WEST
DLPO –EMBU NORTH

APPENDIX 2: RESEARCH INSTRUMENTS FOR THE STUDY

Appendix 2.1 Questionnaire for Small Scale Dairy Farmers

INFLUENCE OF MILK INTERMEDIARIES' PURCHASING STRATEGIES ON THE SUSTAINABHILITY OF SMALL-SCALE' DAIRY FARMING SSDF; QUESTIONNAIRE FOR SMALL-SCALE DAIRY FARMERS

This research questionnaire is designed to examine influence of intermediaries' strategies on the sustainability of small-scale' dairy farming SSDF and will be used purely for academic purposes. The respondents are dairy farmers (owning 1-5 cows) but are involved in milk selling

Please respond to all items on the questionnaire with sincerity. All information will be treated with absolute confidentiality and anonymity. Kindly **fill** the questionnaire/**tick** where necessary. **(do not write your name)**

Your co-operation and honesty in filling this questionnaire will make this study successful and effective.

Part one: General Characteristics of the Small-scale dairy Farmers

1. Your gender: Male [ ] Female [ ]
2. Your Age brackets: 18 - 35 [ ] 36 -53 [ ] 54 and above [ ]
3. Location of your dairy farming project : (a) Manyatta Division [ ] (b) Nembure Division [ ]
(c) Central Division [ ]
4. How many cows do you have? 1 [ ] 2 [ ] [ ] 3 [ ] 4 [ ] 5 [ ]
5. How long have you been on dairy farming project?

6months [ ] 1 Year [ ]2 Years [ ]3Years [ ] 0ver 4 years [ ]

6. Does the dairy farming project able to sustain itself? Yes [ ] No [ ]

Part two: Milk Pricing

6. In the table below, rank in ascending order, your milk buyers according to the amount you sell to them (with 1 being your main buyer) and indicate if you are involved in milk pricing decisions (tick the appropriate options). Quote the price you charge per litre and indicate duration of payment as ranked below:
   1. Instant payment (one day), 2. Weekly, 3. Monthly, 4. Over one month

Type of Milk Buyer	**Rank**	**Not Involved In Pricing Decision**	**Involved in Pricing Decision**	**Price of milk per litre (Kshs)**	**Duration of payment using given ranks**
Co-operative/SHG					
Hawkers/middlemen					
Private dairies					
Hotel/kiosk					

7. How does the pricing decision affect you when it is done by buyers without your involvement? Positively [ ] Negatively [ ]

8. What influence your decision on whom to sell your milk to?
   Price offered [ ] Mode of Payment and Reliability [ ] Services offered [ ] Others [ ]
   Specify _____

9. Are there any limiting factors/impediments that you encounter when deciding whom to sell your milk to? Yes [ ] No [ ]

10. If yes, list three main impediments you encounter in No. 9 above?

_____

_____

_____

Part three: Contract milk marketing

11. Do you sell milk on contract basis? Yes [ ] No [ ]

12. If yes, is your contract written or verbal? Written [ ] Verbal [ ]

13. Give the main reasons that influenced your decision to enter into this contract.
    Reliable milk market [ ] Provision of inputs/Services [ ] Fluctuation of milk prices [ ]

14. Do you get dairy farming inputs/services on contract basis? [ ] Yes [ ] No

15. If yes to No. 14 above, how do you pay for inputs/services?
    Cash [ ] Deducted from milk sales [ ] Others [ ] Specify _____

Part Four: Input/services provision

16. Where do you get advices on management of your dairy farming cow?
    Milk Intermediaries [ ] Livestock Production Extension t officers [ ]
    Others [ ] Specify _____

17. Do you pay for advice? Yes [ ] No [ ]

18. If yes to No. 18 above, how do you pay? Cash [ ] .Deducted from milk sales [ ]
    Other [ ] specify _____

19. Where do you get AI services? Co-operative society/organization [ ]
    Private AI practitioners [ ] Others [ ] (Specify) _____

20. How do you pay for AI services? Cash [ ] Deducted from milk sales [ ]
Others [ ] Specify) _____

21. Do your dairy cows experience pest and disease problems? Yes [ ] No [ ]

22. If yes, who attends them? Staff from our co-operative society/organization [ ]
Private animal health practitioners [ ] Others [ ]
Specify)_____

23. How do you pay for services in No. 23 above? Cash [ ] Deducted from milk sales [ ]
Others [ ] (Specify) _____

24. Where do you get your dairy farming input supply? Co-operative society/organization [ ]
Private Agro-vet shop [ ] Others [ ] (Specify)_____

25. How do you pay for dairy farming inputs? [ ] Cash Deducted from milk sales [ ]
Others [ ] Specify)_____

THANK YOU

Appendix 2.2 Questionnaire for Milk Intermediaries

QUESTIONNAIRE FOR MILK INTERMEDIARIES WHO BUY MILK FROM SMALL-SCALE DAIRY FARMERS IN MANYATTA CONSTITUENCY

This research questionnaire is designed to establish factors that influence intermediaries' purchasing strategies on small-scale' dairy farming SSDF and will be used purely for academic purposes. The respondents are milk intermediaries who buy milk directly from small-scale dairy farmers (owning 1-5 dairy farming cows).

Please respond to all items on the questionnaire with sincerity. All information will be treated with absolute confidentiality and anonymity. Kindly **fill** the questionnaire/**tick** where necessary. **(do not write your name)**

Your co-operation and honesty in filling this questionnaire will make this study successful and effective.

Part I: General Characteristics of the in Intermediary

1. Name of Milk intermediary agency _____
2. Location of intermediary project : (a) Manyatta Division [ ] (b) Nembure Division [ ] (c) Central Division [ ]
3. How much milk do you buy on a daily basis? 1-20 Litres [ ] 21–40 litres [ ] 41-60 Litres [ ] 61 - 80 Litres [ ] Over 81 Litres [ ]

Part II: Milk Pricing

4. What are the factors that you consider when coming up with buying price? Transport costs [ ] Transactional Costs [ ] Processing Costs [ ] Selling price [ ] Others [ ]
   Specify _____
5. What duration do you take before you pay your milk suppliers? Instantly [ ] weekly [ ] Monthly [ ]

Part III: Contract Milk Marketing

6. Do you buy milk on contract basis? Yes [ ] No [ ]
7. If yes to question 6 above, indicate whether your contract is written or verbal
   Written [ ] Verbal [ ]

8. What reasons made you enter into contract? Reliable milk supply [ ] Milk price fluctuations [ ] Others [ ] Specify _____
9. Do you sell your milk on contract basis? Yes [ ] No [ ]
10. If yes to question 9 above, is the contract written or verbal? Written [ ] Verbal [ ]

Part IV: Provision of Services/Inputs

11. Do you provide dairy farming inputs to your milk suppliers? Yes [ ] No [ ]
12. If yes to Question 11 above, indicate the mode of payment? Deducted from milk sales [ ] Cash [ ] Others [ ]Specify _____
13. Do you give credit (loans) to your SSDF milk suppliers? Yes [ ] No [ ]
14. If yes to question 13 above, indicate interest rates you charge? (1-5)% [ ] (6-10) [ ] (11-15)%[ ] (16-20) %[ ] Over 21% [ ]
15. What is the mode of payment for credit given? Deducted from milk sales [ ] Monthly cash payments [ ]
16. In the table below, tick the services you offer to small-scale milk suppliers and the mode of payment.

Service	Tick	Mode of payment		Others (Specify)
		Cash	Deducted From Milk Sales	
Advise/training on dairy farming cow management				
Artificial Insemination services				
Pests/disease Treatments				

THANK YOU.