

**THE INFLUENCE OF WOMEN GROUPS ON INCOME AND GENDER
RELATIONS IN DAIRY FARMING: CASE OF
ARUMERU DISTRICT**

BY

ESTHER GWAE KIMARO

**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT FOR THE
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ABSTRACT

A study on the influence of women groups on income and gender relations in dairy farming was carried in Arumeru district. The study aimed at determining sources of household income, differences in income from dairy production between women in groups and those not in groups and to investigate gender relations in management of dairy production. The study was conducted in six villages namely Bangata, Sasi, Inshupu, Enaboishu, Sokoni II and Nkoaranga whereby both women in dairy farming groups and those not in groups were surveyed. Cross sectional research design was adopted using structured questionnaires to collect information from households. Furthermore, an in depth interview with key informants was done to gather more information on dairy farming. Statistical Package for Social Sciences (SPSS) was used for data analysis. *Chi-square* and *t-test* were used to test the statistical significance of categorical and continuous data respectively. In addition, regression model was used to investigate the effect of group membership in determining income from dairy farming. Results from the study showed that revenues from dairy products such as fresh milk, sour milk and butter brought more income than other sources. It was also found that group membership was not a determinant of income from dairy farming though women in groups had access to several benefits such as access to loans, training, provision of dairy cattle etc. It was also observed that being in groups assisted women to overcome traditional men dominance which blocked their rights in decision making and owning resources. To improve performance of women's group in dairy farming, it was recommended that, women groups should get more financial assistance from the government, local NGO's and donors. In conjunction with encouraging more women to join groups, gender relations in dairy management should be reassessed to minimize the work load burden to women, which affects the level of production.

DECLARATION

I, ESTHER GWAE KIMARO, do hereby declare to the Senate of neither the Sokoine University of Agriculture that this dissertation is my own work and has never been submitted nor concurrently being submitted for a higher degree award in any other university.

.....

Esther Gwae Kimaro

.....

_____Date

The above declaration is confirmed

.....

Prof. Mlangwa, J. E. D.

(Supervisor)

.....

_____Date

.....

Dr. Lyimo-Macha, J. G.

(Supervisor)

.....

_____Date

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DEDICATION

| ~~My~~ This work ~~This work~~ is dedicated to my beloved parents Mr. Naftal Salanga Gwae and Mrs. Angelina Naftal Gwae who laid down the foundation of my education.

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LIST OF ABBREVIATIONS

DAFCO	Dairy Farming Company
<u>DVO</u>	<u>District Veterinary officer</u>
FAO	United Nations Food and Agriculture Organization
GDP	Gross Domestic Product
HPI	Heifer Project International
IDAFASO	Inshupu Dairy Farmers Association
IFAD	International Fund for Agriculture Development
IFPRI	International Food Policy Research Institute
ILO	International Labour Organization
ILRI	International Livestock Research Institute
LITI	Livestock Training Institute
MALD	Ministry of Agriculture Development
MDB	Marketing Development Bureau
MOAC	Ministry of Agriculture and Cooperation
MSE	Micro Small Enterprises
NAIC	National Artificial Insemination Centre
NGOs	Non Governmental Organizations
OXFAM	International organization for more equitable world
PRIDE	Promotion of Rural Initiatives and Development Enterprises
PRSP	Poverty Reduction Strategy Paper
RDV	Rural Development Department
SEDA	Small Enterprises Development Agency
<u>SME</u>	<u>Small and Medium Enterprise</u>
<u>SDDP</u>	<u>Small Scale Dairy Development Programme</u>
<u>SNAL</u>	<u>Sokoine National Agriculture Library</u>
<u>SPSS</u>	<u>Statistical Package for Social Science</u>
<u>TAHEA</u>	<u>Tanzania Home Economics Association</u>
<u>TASAF</u>	<u>Tanzania Social Action Fund</u>
<u>TGNP</u>	<u>Tanzania Gender Networking Programme</u>
<u>UNFPA</u>	<u>United Nations Fund for Population Activities</u>
<u>UNICEF</u>	<u>United Nations Children Education Fund</u>
<u>UNIDO</u>	<u>United Nations Industrial Development Organization</u>
<u>UNIFEM</u>	<u>United Nations International Fund for women</u>
<u>URT</u>	<u>United Republic of Tanzania</u>
<u>WB</u>	<u>World Bank</u>
<u>WIG</u>	<u>Women in groups</u>
<u>WNG</u>	<u>Women not in groups</u>
<u>SNAL</u>	<u>Sokoine National Agriculture Library</u>
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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background information

Livestock production is one of the major agricultural activities in Tanzania. This sub sector contributes to the national food supply and it converts rangeland resources into products, which are suitable for human consumption. It is also a source of cash income (Tanzania National Website, 2003). Providing adequate nutrition and attaining self sufficiency in the food supply for the human population has been the cornerstone of Tanzania's food policy for the past thirty years (MOAC, 1997). On the economic front, Tanzania has embarked on different policies aimed at raising the living standards of the population and eliminating abject poverty by 2025 (PRSP, 2000). The livestock sub-sector has been contributing towards the achievement of these twin objectives: household food security and income.

The livestock sub-sector contributes approximately 8% of the total GDP and 30% of the agricultural GDP. The dairy industry contributes 30% of the livestock GDP: beef (40%) and other livestock (30%) (MOAC, 1997). The per capita consumption of livestock products, by the human population of 34 million, is only 7 kg of meat, 26 litres of milk and 11 eggs per person, per annum. The recommended FAO figure for normal human health is 50 kg of meat and 100 liters of milk per person, per annum.

Over the last 20 years, dairy farming in Tanzania has been in a rapid transition period. This has included new policies, which promote small-scale dairy farms. Smallholder dairy production in Tanzania is very much concentrated in the highland areas of Kilimanjaro,

Arusha, Iringa and Mbeya. The increased demand for fresh milk in urban centers, in recent years, has resulted in an expansion of smallholder dairy production around these centers. Until recently, the Tanzanian government's policy, relating to dairy development, focused mainly on large-scale state-owned farms. However, the new Tanzanian livestock policy gives due emphasis to the development of the smallholder sector, through an increased supply of upgraded cattle and animal feeds and other production inputs, which include extension services (MALD, 1983). The Tanzanian livestock policy, amongst other factors, focuses on livelihood improvement and the reduction of poverty for the smallholder livestock farmers.

As far as poverty is concerned, a person is termed to be poor if she/he does not attain the minimum level of well being. More than a third of Tanzanians cannot satisfy their basic needs and nearly 18 per cent cannot afford the food required for healthy living. At the international level, there is an unequal economic and political partnership, which is reflected in unfavourable terms of trade and other transactions with developed countries. This situation is a major cause of poverty in developing countries. Further causes of poverty are not so direct, for example, tradition and norms, which hinder effective resource utilisation and the people's participation in income generating activities.

It is commonly accepted that several socio-economic features are reflective of a poverty situation. These features include: a high rate of morbidity and mortality; the prevalence of malnutrition and illiteracy; a high infant and maternal mortality rate with low life expectancy; poor quality housing; inadequate clothing; low per capita income; lack of access to basic services, such as safe water; food insecurity; and poor technology. These features can be used to identify poor and non-poor individual households within societies

or communities. An individual household or community, found to be characterized by some or all of these features, can be identified as being poor (URT, 1999).

Women are generally most affected by poverty in Tanzanian society. Pearson (1992) asserts there is substantial evidence that women have consistently lost out in the development process. The reason for the higher incidence of poverty, which affects women more than men, is their lack of access to key inputs and their low decision-making powers. The contribution of women is rarely, or just marginally, included in the national statistics for production and income, despite the fact that women produce more agricultural products than men (TFNC and TAHEA, 1987).

Dairy farming is amongst several small scale or micro-enterprises widely used to raise household income, apart from it also being a source of protein; A dairy cow self-help project will provide nutrition and a source of additional income to families, similarly, dairy farming foster families. In most rural areas of Tanzania, for example the Arumeru district, women have been engaged in dairy farming for many years. In order for a small dairy enterprise to be effective, a number of women's groups have been formed in relation to dairy farming and this has been linked to women's roles in dairy farming activities. Milk processing and marketing of the products is carried out within these groups.

1.2 Problem statement and justification

Poverty reduction has been a concern for many developing countries. In third world countries, various policies and strategies are being adopted to reduce or alleviate poverty (Hurley, 1990). The general development of people, particularly women, has for a long time been affected by poverty, most notably in rural areas. The majority of women in

Arumeru and similar districts in Tanzania live at very low levels of welfare with poor access to health facilities, education, food security and vital resources (Makombe *et al.*, 1999). In previous years, Arumeru was among districts, which benefited from coffee production but in recent decades coffee prices have fallen, thus reflecting the collapse of its price in international markets. According to Oxfam [report](#) (2001), concerning field research in coffee farming communities in Kilimanjaro and Arusha, it was stated that the collapse in the price of coffee was a disaster. About ten years ago, when coffee prices were high, people could afford to send their children to school and buy food with the increase in their income but this is not happening nowadays.

Several efforts have been made to improve the wellbeing of the people, following the fall of coffee prices. Women have engaged themselves in several income generating activities, which include improvements in dairy farming, agriculture and vegetable growing, in addition to gaining access to women's savings and credit services offered by several microfinance enterprises, such as PRIDE and SEDA.

It is believed that the high potential for dairy production has resulted in livestock making a larger contribution to the improvement of household incomes in Arumeru district. However, the actual contribution coming from smallholder dairy farming is less known. As explained in the introduction section, women make a large contribution to the dairy sector in Arumeru district and women's groups have been formed within Arumeru district for a period of time. Therefore, a study was needed to assess the importance of these groups in determining income, and in influencing gender relation in dairy management.

The results from this study will be useful to policy makers, academicians, researchers, planners, NGO's and development agencies in generating programmes for women in rural

areas, as part of poverty reduction strategies in Tanzania. Findings from the study will add to the sparse literature available on this issue in Tanzania.

1.3 Objectives

1.3.1 General Objective

To assess the role of women's groups in determining income from, and gender relations in, dairy farming at household level in Arumeru district.

1.3.2 Specific Objectives

- i. To determine the women's income from dairy farming and other sources of income
- ii. To compare the income from dairying between women who are in groups and women who are not in groups
- iii. To investigate gender relations in the management of dairy farming.

1.3.3 Research Questions

- i. What is the contribution of dairy farming to a household income?
- ii. What are the other sources of income for women in Arumeru district?
- iii. Which benefits are obtained by forming women farmers groups?
- iv. Do women have control of the income which is obtained from dairy production?

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CHAPTER TWO

2.0 LITERATURE RIVIEW

2.1 Women in livestock production

Poverty has remained widespread and deep, with half of all Tanzanians living under conditions of deprivation. Poverty is concentrated in rural areas, where approximately 70% of Tanzanians live (URT and WB, 2001). The rural poor lack more than just a sufficient income to meet the minimum level of human needs. They often lack legal rights and representation in the society, also lack basic services and capacities, such as health, education and nutrition (World Bank, 2000). Concern for women, within the poverty alleviation efforts in Tanzania, is important because women have always been perceived as the most disadvantaged group in the country (Misana, 1995; URT and UNICEF, 1990). Globally, the issue of women and poverty requires special consideration, because women and girls from poor rural households bear a disproportional high share of the poverty burden. This is manifested in the nature of women's work in agriculture, which includes; exposure to certain health hazards; the unequal time devoted to work and rest by men and women in rural areas; women's unequal access and control over cash and the implication of this situation in poverty alleviation; and the nature of women's domestic and reproductive work (Batliwala, 1983). According to IFAD (1993), the majority of food producers in Tanzania are women. Moreover, women are not only the main contributors to the production of food, but they are also in charge of many other productive and reproductive tasks.

Investment in livestock has been prominent amongst the many tools used by the rural poor in the developing world, in order to reduce risk and alleviate poverty (RDV, 2001). This investment tool is commonly used in poor rural areas and it is vested in traditional hedging and safety net systems. The provision of livestock, through inheritance or gifts, has been a

mainstay of most rural societies. As such, livestock owners use their animals either as means of production or capital, or both (RDV, 2001).

According to (IFPR, 2001), demand for livestock products is expected to double in developing countries in the next twenty years, therefore deliberate effort is needed to alleviate several barriers in this sector. In order to achieve this, it is therefore important therefore to empower women in several ways such as implementing new policies and practices; protect women's ownership and user rights; providing them with appropriate training on quality production, processing and marketing, also to encourage them to form farmers groups, participating in agriculture shows and study tours. However, some efforts have been taken in different areas of Tanzania in order to improve women capacity in livestock production. Since 1990s number of Microfinance Institutions (MFIs) has been increasing in the country. According to RDV (2001), there are many MFIs which operate sustainably in different regions of Tanzania. These institutions have been a great help in enabling women to access small scale loans which help them to buy livestock or improve the management.

Apart from MFIs, several Non Governmental Organizations (NGOs) such as Heifer Project International have been in the front line to assist small scale farmers to obtain dairy cattle in kind. Apart from provision of livestock, these NGOs also conduct training which have been very significant in improving livestock management.

Heifer Project International (HPI) has found that, with careful planning, women's livestock projects can lead to both economic success and empowerment (Beth, 2001).

It is increasingly recognized that animals under women's control are more likely to improve household welfare than similar assets held by men (Beth, 2001). Apart from being used for income generation or cultural purposes, livestock through their products

such as milk, eggs and meat have been important in alleviating malnutrition disorders because they contain high quality protein, calories, vitamins, and minerals (Beth, 2001).

2.2 Women as change agents

Women in the third world contribute 60 to 80 percent of the labour in both food production for household consumption and for sale food production (FAO, 1995). They also run 70 percent of small scale businesses and make up one third of the official labour force in addition to caring for their families and homes. However, their status rarely reflects this enormous and vital contribution. Women have had less access to income, education, health, property ownership, legal rights or political power (UNFPA, 2002).

Women can make a difference when they get a chance and become the source of development to their families and community as the whole (ILO, 2001). As observed by UNIFEM (2003), rural women play key role in their societies at three levels: *Aggregate level*: Women contribute more in labour force in community development. *Household level*: Women are producers of both marketed and unmarketed goods and services, much of which is either under enumerated or not included in the national accounts. This makes them key players in finance issues such as capital accumulation and savings.

Inter-generational level, Women are the bearers and rearers of the next generation of the labour force, they are primarily responsible for children's health, safety, education and socialization.

According to Warring (1998), at the national level, women's contribution to the labour force, as workers, contributes to the national welfare and income, although a significant part of their contribution is uncounted and a large amount of the remainder is under

counted. Various estimates suggest that, if women's productive and reproductive activities were fully incorporated into the national accounts, women would be found to contribute between 30 and 40 percent to the Gross National Product (Lorraine, 1997).

At the household level, their role is particularly important because poverty is typically, amongst other factors, a consequence of the low productivity of the main income earner. As a result of their lack of education and skill, the poorest households often need more than one income merely to survive. The role of woman in the household contributes directly to the income of poor households is important, both quantitatively and qualitatively. In terms of quantity, the income provided by women is often either the mainstay of poor households or a substantial component of the total income. Resource poor households are even more dependent than others on women's labour in the subsistence food sector and/or their earnings from wage labour or non-farm enterprises (Jazairy *et al.*, 1995).

Most of the income earned by women goes directly towards meeting the needs of the families, particularly children and very small proportion is used to meet their personal needs. Contrary to this, men's earnings are used more for their personal uses, such as cigarettes, alcohol and other social needs (Lorraine, 1997).

Women who are struggling to ensure the survival of their families may be forced to neglect their own nutrition and the health of their young children and they often experience higher levels of infant mortality (UNIFEM, 2003).

2.3 Dairy industry in Tanzania

Tanzania is the 3rd country in Africa, in terms of livestock numbers, after Sudan and Ethiopia (Wilson, 2003). More than 90% of all livestock are indigenous stock. There are

approximately 16.3 million cattle of which 0.2 million were improved cattle (Mulangira, 1997). Efforts to develop the dairy industry in Tanzania started way back in the 1950s and early 1960s and by the mid 1980s it was realized that, in order to transform the dairy sector, small holder dairying production needed to be encouraged and promoted, not only as a means of alleviating poverty but also as a means of achieving national/household sufficiency in milk and milk products: that is food security and a source of income earning (MALD, 1983). In mixed and integrated farming systems, livestock contribute to both intensification and diversification of income streams. The majority of the rural poor depend on such systems (Upton, 2004).

The dairy industry in Tanzania has come a long way since the days of the state owned farms and processing industries. Smallholder farmers are playing an increasingly important role in milk production, processing and marketing (Mdoe and Kurwijila, 1998). Traditional dairy cattle still contribute a significant amount: i.e. over 75% of the estimated 880 million litres which are produced and consumed in Tanzania. The contribution of the smallholder production is presently about 30% and increasing, but it accounts for over 855 million litres of marketed milk (Mdoe and Kurwijila, 1998). Several Non Governmental Organisations (NGOs) introduced beef, dairy cattle and goats to villages, in order to promote the production of meat and milk with the intention of alleviating malnutrition and enhancing income generation at household level. The animals are also intended to be a source of manure for production and already several villages have benefited under the scheme “borrow a cow/goat, pay a cow/goat (Kurwijila, 2002).

According to (Urassa and Raphael, 2001), the dairy industry has a potential to contribute even more to household incomes and food security. But, this potential is constrained by seven problems, which are as follows:

- a) Inadequate land (tenure system), water and animal feeds, including pastures and rangelands
- b) The type of livestock and production system;
- c) Poor animal diseases surveillance and control system
- d) Inadequate marketing and processing infrastructure
- e) Operational constraints, including policy, institutional structures and human resources.
- f) Inadequate farmer training and information
- g) Inadequate credit facilities

2.4 Smallholder dairy development in Tanzania

The livestock sector is dominated by smallholder owners who constitute 99% of national stock (Mlozi *et al.*, 1989). The livestock sector in Tanzania employs 10% of the total population and it is the most important source of protein (Massae, 1993). In recognition of this central role of smallholder farmers in the development of the dairy industry in Tanzania, the government has, with assistance of bilateral donor agencies, supported a number of smallholder dairy development programmes in the country, including: The Dairy Development Programme (SDDP) in Iringa and Mbeya (Swiss government assistance); the Arusha/Kilimanjaro Dairy Extension project (FAO/UNDP assistance); the Kagera Smallholder Dairy Extension Project (Dutch government assistance); and the Heifer Project International (HPI) Heifer-In Trust (HIT) Schemes (Massae, 1993). The merits of this sector are that dairy production is more efficient and is better exploited, due to generally better animal husbandry practices followed by smallholders (Kurwijila, 1991). Smallholder dairy farming is an important part of the household economy of some parts of Tanzania, particularly where land is a limiting factor for agriculture (Mdoe and Nyange, 1993).

Smallholder dairy farming gained popularity after the 1983 Livestock Policy and the National Livestock Development Programme. Most farmers in this sector own between 1-10 dairy cows (Massae, 1993). The size of the farmer's holding is usually the major constraint to increasing herd size. Approximately 60% of all dairy cattle in the country are owned by smallholders and most of these are found on the slopes of Mount Kilimanjaro (Kilimanjaro region), Mount Meru (Arusha Region), Southern highlands (Iringa and Mbeya regions) and the Tanga and West Lake regions. The cattle kept are from improved breeds, which include Friesian, Ayrshire, Jersey, Guernsey and their crosses or crosses with Zebu cattle (Masse, 1993). Despite the significance of dairying, some farmers are still not aware of innovations, in both the northern zone (Kilimanjaro and Arusha) and the neighbouring region.

In 1983, the (by then) Ministry of Livestock Development (MALD) produced, for the first time, a policy pertaining to livestock development in Tanzania. This policy, the importance was stressed on developing smallholder dairying on the periphery of urban areas, where conditions were suitable for milk production. Later, increased attention was given to developing smallholder dairy unit farms, not only on the periphery of urban areas but also with dairy smallholders based in rural area (MoAC, 1998).

The 1983 policy clearly indicated the government's awareness of livestock as an important productive sector. However, the poor performance of this sector was also noted. The policy speculated that short, medium and long term objectives, such increasing availability of livestock derived foods to all Tanzanians and increasing the incomes of people engaged in production, processing and marketing of livestock and livestock products.

2.5 Women working in groups

Women's empowerment is strengthened through group action and support (Misana, 1995). Group discussions help communities explore women's decision-making powers, particularly over large and valuable animals, so that men do not feel threatened. Facilitation by a respected leader or professional helps to clarify the benefits of livestock to all family members.

The HPI project requires a written contract with all project recipients to "repay the loan" through "passing on the gift" This involves giving the first female offspring (or cash equivalent) from a cow, goat or other animal, to another needy family in the same group. The payback is essential for active participation in group training and other activities. Projects that hand out animals, without requiring repayment, usually fail. Projects are more successful where animals are managed by individual families, rather than by groups, unless there is a strong tradition of group herding (Beth, 2001).

2.6 Women dairy farmers in Arumeru district

In the early 1990s, when the price of coffee collapsed in world market, Wameru were amongst many people who were affected. The fall of coffee prices in 2001 and 2002 affected over 400,000 low-income, coffee-producing households in Tanzania (Oxfam, 2001). The 1993 liberalization of the coffee sector exposed farmers and their marketing organizations to intra-seasonal price fluctuations. These fluctuations have made it difficult for farmers to optimize production technology, that being the timing of sales and use of assets that could eventually result in higher household incomes (Oxfam, 2001). Exposure to price volatility, coupled with extremely low prices for coffee, has greatly diminished the

overall welfare of coffee farmers (WB, 2002). Several efforts have been made to improve the wellbeing of people, following the fall of coffee prices. Women engage themselves in several income generating activities, which included improving dairy farming, agriculture and vegetable growing together with gaining access to women's savings and credit services offered by several microfinance enterprises such as PRIDE and SEDA. Women in villages were advised to form groups of 20 people, so that through these groups they would be able to access any loans or grants provided by the government or Non Governmental Organisations. The village chairman, representing different villages within Arumeru district, began liaising with the banks and the SEDA, in order to enable women to gain access loans.

Global Partners as NGOs also contributed to the development of women in Arumeru district. In 1998, Global Partners began the B.E.S.T (Building Economically Sustainable Tomorrows). Global Partners for Development works in the East African countries of Kenya, Uganda and Tanzania. The key to the success of their projects is that they work directly with local organizations, school districts, cooperatives and community governments (GPP, 2004). Some of the women's groups in Arumeru district were given heifers by Global Partners in 2001/02 and they were suppose to pass one onto the second group after calving. Also, some of the group received a loan from SEDA and this money helped them to start new enterprises, for example, selling bananas, horticultural products and clothes, whilst other women groups deal with small dairy processing plant, where they were able to make yoghurt, cheese, butter and sour milk. These products were taken to the town and the milk collection was undertaken by members of the group themselves in the mornings and evenings. The milk collected was used for making milk products and the excess could be sold to other consumers.

2.7 Income from dairy farming and other economic generating activities

The micro and small enterprises (MSEs) which have increased tremendously since the mid-1980s, have now become the main source of employment and income for the majority of people in developing countries, including Tanzania. Moreover, entrepreneurship in this sector is widely seen by policymakers and donors as a means of economically empowering marginalized groups, including disadvantaged women such as single heads of household or women in rural areas (Hannan-Andersson, 1995). Dairy farming includes the management of dairy cows, the cultivation of crops for feed, the production of milk and cream, and the manufacture of butter, cheese, and ice cream. (Mdoe, 1993). Most smallholder production is concentrated in the regions of Arusha and Kilimanjaro where approximately 66% of dairy cattle are located. Per capita milk availability varies widely geographically depending on local cattle populations and seasonally due to feed availability (Kurwijila, 1996).

A rapid appraisal study identified five dairy production systems that have evolved in Tanzania over time (MoAC/SUA/ILRI, 1998). These are:

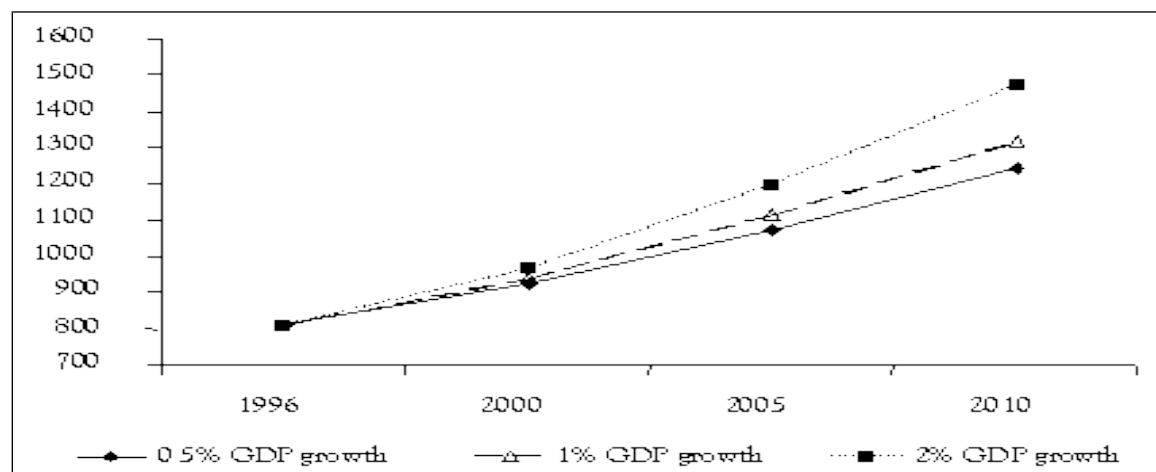
- (i) Smallholder dairy farming, integrated with perennial crops like banana and coffee, found in the northern, southern highlands and western regions of Tanzania; and Smallholder dairy farming integrated with annual crops like maize and cereals found in the central part of Tanzania.
- (ii) Medium-scale dairy farms found near big urban centers such as Dar es Salaam, Tanga, Mwanza and Musoma. Average of 10 to 50 cows, are kept for milk production. There is little crop cultivation and a limited level of mechanization.

- (iii) Peri-urban dairy is found in the coastal belt, mainly in Dar es Salaam, Tanga, Morogoro and other urban centers where many civil servants and businessmen have taken up dairying as a means of generating additional income.
- (iv) The traditional, semi-sedentary system, which accounts for 75% of total milk production.
- (iv) Parastatal large-scale dairy farms. The government through the dairy farming company (DAFCO) operated at least 7 dairy farms with a total of over 3000 dairy cattle. Most of these farms have been privatized or are in the process of being privatized.

The current status of the Small and Medium Enterprise (SME) Sector in Tanzania is largely informal, under-performing and in need of considerable assistance to overcome barriers to its growth. (UNIDO, 1999).

Dairying provides women with a regular daily income, which is vital to household food security and family well-being. According to Mrema, (1994), common market for small holder milk producers in Tanzania include: hotels, restaurants, institutions such as schools including nurseries. However, the marketing of milk is still dominated by informal milk marketing. It has been reported that less than 10% of milk produced in the country is marketed as processed milk and milk products. High milk producing areas are situated far away from milk centers in the major urban centers. The range of dairy products on the market is still very limited. Over 90% of the milk marketed informally is sold as raw milk by informal market intermediaries with all the attendant health risks (MoAC/SUA/ILRI 1998). In some towns like Mwanza, Tabora and Shinyanga, itinerant milk vendors supply nearly all the fresh milk consumed (Sumberg 1996; Stewart 2000; SUA/ILRI 2000).

The overall per capita milk availability in Tanzania is low (20–22 kg/annum) compared with Kenya (80 kg/annum), the average for Africa (35 kg/annum) and the world average (105kg/annum) (Kurwijila,1996). The reason behind poor performance of dairy sector in Tanzania is due to the predominance of the low milk producing zebu cattle (with yields of about 200 kg/annum) and a relatively small improved dairy herd producing below potential, lack of milk marketing infrastructure, low purchasing power and the cultural food consumption habits of consumers (Msechu, 1988).



Source: MoAC/SUA/ILRI (1998)

Figure 1: Milk production performance over years

Against this background of opportunities and constraints, the Agriculture and Livestock Policy sets a target of increasing the per capita supply of milk to 26 kg/annum by the year 2000 implying a dairy herd increase to about 500 thousand head by the same year (MoAC, 1998). To overcome the identified constraints and make use of available opportunities (suitable land, climate, a large cattle population, growing demand for milk and milk products), the dairy industry needs to develop appropriate policies and development

strategies within the framework of the macro-economic and the Agricultural and Livestock Policy environment prevailing in Tanzania. Over the years, the overall objectives of Tanzania's dairy development policy have been attainment of national self-sufficiency in milk and dairy products and contribution to poverty alleviation (Kurwijila, 1996).

The 1983 Tanzania livestock policy gives due emphasis to the development of the smallholder sector through increased supply of upgraded cattle, animal feeds and other production inputs, including extension services (MALD, 1983).

Livestock embody savings and may provide a reserve against emergencies. If an urgent need for funding arises, for a special occasion or a disaster such as drought, animals may be sold to raise the needed money or slaughtered and consumed to provide energy and protein (Upton, 2004). In Tanzania, money from sales of live animals or animal products have been used in meeting various household expenses, including health, education construction and many others (Urassa and Raphael, 2000; Masako, 2002; Kalavo, 2002).

Apart from dairy production, women in several parts of Tanzania and other developing countries have engaged themselves to wide range of economic activities. According to Rutashobya (1995), most women entrepreneurs engage in trading, food processing, textile and clothing, and provide services for businesses as elaborated in Table 1. They tend to undertake activities that are in harmony with their traditional roles.

Table 1: Gendered and neutral business activities

Gendered (Typical Female)	Neutral	Gendered (Typical Male)
Food vending	Retail shops	Manufacturing
Tailoring/batik making	Crop dealers	Import/export
Beauty saloon	Horticulture	Wholesale trade
Local brewing	Kiosks	Transportation
Informal catering	Charcoal retailing	Tour agencies
Pottery		Estate agent
Basket making		Hawkers
Informal food processing		Charcoal wholesales
		Restaurants
		Bars
		Formal food processing

Source: Rutashobya (1995)

In reality, women entrepreneurs differ in many ways in terms of: age, religion, ethnicity, wealth, education, literacy, marital status, social status, experience and socioeconomic position. They also differ in terms of their motivation to start and develop businesses. These differences, according to Koda (1995), are responsible for a considerable variation in the nature, scope and magnitude of women's entrepreneurial activities. Poor and uneducated women, for example, will be found in the informal sector, operating small eating places (mama lishe); the richer women have more capital and hence run relatively large enterprises, employing more labour and using appropriate technology.

There is a wide range of reasons as to why women choose to engage in income generating activities. They have been categorized as push and pull factors as documented by Rutashobya (1995); Temu (1998); Lwihula (1999); Nchimbi (1999, 2002); ~~and~~ Olomi (2001) in Table 2 below.

Table 2Table 3: Reasons for women to engage on income generating activities

Push factors	Pull Factors
To meet basic economic needs, either because the women is single and has no formal employment or spouse income is inadequate to meet family needs	To have something she can have control over
To supplement income from the women's salary in order to meet her and her family's basic need	To raise her social status and earn the respect of her husband and the community
Creating breathing space for the women. Staying around the house all the day long inviting quarrels with neighbours and family members Local brewing	To have greater flexibility (compared to employment) to combine work and her household responsibilities To be able to access credit offered by some donors supported projects. In some cases the money borrowed is not used in the business but rather to meet other pressing needs
Source: Rutashobya (1995), and Nchimbi (1999) and <u>and</u> Olomi (2001)	

According to Rutashobya (1995), Lwihula (1999) and Nchimbi (1999), women's choice of the activities in which they engage themselves is determined by number of factors such as their reproductive roles, abilities (skills level), limited start-up capital, limited access to working capital and their limited capacity to absorb the consequences of failure.

Women start businesses in number of ways, such as: being alone or in association with other women, friends or family members. However, research has revealed that women's and men's perceptions on businesses differ. While men treat their businesses as economic entities, women's businesses become integrated with other demanding areas of life (Nchimbi, 2002). As result women entrepreneurs have been found to assess their business success using criteria other than the traditional economic ones (Nchimbi, 1999, 2002). Whereas male entrepreneurs use economic criteria to assess their business success, women put more emphasis on family and employee related matters. A crucial question therefore is: "Can women be as successful as men in this economic sphere?" The issue here lies in the meaning attached to the business and also in the definition of success.

The enterprise culture in Tanzania is still under-developed. This is partly because for 20 years, the enterprise culture was suppressed in favour of building a socialist society. As a result, there are few people with exposure to or experience in serious, private business activities. Those who are in business are almost exclusively first generation. Indeed, studies by Nchimbi (1998) and Temu (2002) revealed that the majority of Tanzanian enterprises were started during the 1990s. Most of those who currently populate the small business sector are "survivalists" rather than serious entrepreneurs. They have been forced into business by economic necessity as opposed to the "entrepreneurial spirit". Although this is true for both men and women, studies by Lwihula (1999), Oyhus (1999) and Olomi (2001) show that this is more prevalent among women, who are relative newcomers in the business arena.

Cultural values have however been gradually changing in favour of accepting a more active role by women in income generation activities. The "forced" involvement of

women in business has also given them the opportunity to build experience, confidence and practical skills for generating income and taking care of themselves and their families (Olomi, 2001).

Small business enterprises need a number of support and development services. These include: business premises; technology development; financial services; business information and advice; market and market linkages; business education and training; lobbying and advocacy. These services are available to varying degrees as discussed below.

Marketing is critical to the success of enterprises, regardless of their size or of any gender dimensions. The inability to develop markets outside the immediate locality or to compete is one of the most serious impediments to the performance of MSEs. Lack of market opportunities is a key constraint for MSEs in expanding employment and improving the quality of jobs so as to generate more decent work (ILO, 2001).

2.8 Gender relations in management of dairy farming

Gender refers to the different social roles that women and men play and the power relations between them. According to Budak, *et al* (2005), gender relations influence how communities, households and institutions are organized, how decisions are made and how resources are used.

During the last decades, the gender issue has attracted the attention of many researchers in addition to government and development agencies. Gender differences are now more often taken into account at the design stage. For small farmers, dairy production is a family operation where each member contributes to and benefits from the different activities and they are all involved in different ways.

Women participation in production is highly increasing compared to their limited access to resources ownership and decision making. According to UNICEF (1990) reports, that, it has been observed that women carry out 70 to 80 % of all subsistence farming in Africa. While men are more involved in land tiling and clearing fields, women are responsible for 60% of harvesting, 70% of weeding and 90% of processing (Biwi, 1993). Despite working in agriculture, women in Africa are also responsible for animal husbandry and other household chores.

Women's role in livestock production is even greater, as they are often responsible for all aspects of animal husbandry, with the exception of herding and marketing. Hence, they feed and water, gather fodder, care for small ruminants, rabbits and poultry, clean stables, collect dung for fertilizers and fuel, care for the sick, pregnant and lactating animals, milk, make butter, cheese and ghee, and breed and select animals (FAO, 1995).

With increasing male out migration and the feminization of rural poverty, women have a greater need and desire for livestock, in order to improve their food security and income levels.

According to Shumaker (1991), he urges that, it is important to make distinction among the types of responsibility that women have over livestock: ownership, control over decision-making, use rights and provision of labour in different agro-ecological zone.

In Latin America, where the GNP is high, as is the rate of urbanization among developing world countries, there is a marked sexual division of labour and a strict normative gender role system within the patriarchal, nuclear household. Women in the Caribbean have much greater social and economic autonomy. The role and status of Caribbean women also

depends on their ethnicity: women of African origin are more independent than their Indian counterparts (FAO, 1993).

In the Middle East and North Africa, where Islam is a determining factor, women are segregated and have lower status, and are controlled and dominated by men. Countries in Sub-Saharan Africa show a wide variation depending on ethnicity, religion, etc., but in general, African Muslim women have greater autonomy and fewer gender-based constraints than in other parts of the developing world. In southern and South East Asia, the three dominant religions (Islam, Hinduism and Buddhism) all confer inferior status on women (Dahl, 1987).

Despite these regional variations, generally the involvement and contribution, women's role in livestock production has often been underestimated or, worse, ignored. Gender-blindness is partly the result of a paternalistic bias, but also of the attitudes of women themselves, who may have been conditioned by their culture and society to undervalue the worth of the work they do. A study conducted in India by IFAD (1999) shows that women and children dominate many areas of animal production. Women contribute 71% of labour in the livestock sector and spend 20 to 25% of their time attending to animal keeping. At home, women influence household decision making but follow-up on decision made is left to men. Key tasks shouldered by women include feeding and watering of animals kept at home, managing domestic water for all uses including animals, care of sick animals, cleaning sheds and pens, collecting manure and eggs, and selling produce locally. Similarly, the study conducted by FAO (1995) shows that in countries such as Egypt, Morocco, Somalia and Turkey, women constitute over 50% of the total labour engaged in agriculture; while in Pakistan, Cyprus, Sudan, Tunisia, Syria, Lebanon and

Iraq, at least one-third of the labour required to sustain agricultural production is provided by women.

In Tanzania, the division of labour among agro-pastoralists often differs significantly from what is considered ideal or the norm. The Wasukuma of Tanzania have a very flexible division of labour, and a lot of variation among households, that depends on family size, settlement pattern, possibility of cooperation between neighbours, etc. (Brandstrom *et al.*, 1979). Among the Barabaig of Tanzania there is a strict division of labour among men and women: men are responsible for all animals, except chickens, and women are responsible for the animals' produce. Men herd, slaughter, provide veterinary care and water the animals, and women do the milking and prepare the hide (Lane, 1991). But in reality, the actual division of labour is more flexible, and depends upon labour shortages, the development phase of the family, the number and type of livestock, etc.

However, there are cases where women are prohibited completely from dealing with livestock. In some societies in the great lakes regions of Central Africa, roles are very much fixed: women hold very inferior social positions and are excluded from dealing directly with livestock (Bonte, 1991).

Lack of women's rights in and control over livestock management and marketing has been caused by several social economic factors:

- a) Lack of land ownership: In many societies in Africa including Tanzania, women do not own land either because of low income which limit them to buy land or because of cultural reason whereby land is inherited by men only. Fortmann (1998) reported that women have less land than men and in the communal areas a divorced woman has no right to her husband's land. According to NEPAD (2005);

land ownership is fundamental to enable women to use it as collateral to secure bank loans. Loans from banks have been an important source of fund for majority of small scale dairy farmers especially women (IFAD, 2007 and Sarah, 2004).

- b) Limited access to extension services: Although women play major role in livestock management, they have less access to extension services and technical knowledge than men (Innocent *et al.*, 2006, 6–and Sarah 2004). Man being the head of household it is assumed that he will pass on the information from extension worker to his wife (FAO, 1996). It has been noted that most of this information is not passed on accurately and therefore slowing the rural dairy sector improvement. Majority of Africa women lack access to extension services because of cultural reasons (Haddad, 2000). According to Ozowa (1995), in Nigeria male extension workers are not allowed to reach women farmers because of religion and cultural taboos. Furthermore, it has been noted that female extension worker understand better the problems of women farmers than male extension workers. Clear understanding of the problem is the starting point of finding solution (Kauzeni, 1992).
- c) High illiteracy level among rural women has been the major limiting factor in economic development. According to FAO (1995), two third of 1,500 million illiterates in the world are women and girls. Lack of education has been a barrier to women to access technical information put in the readable form such as books, posters or leaflets. Similar to this lack of education among women has resulted few women extension worker who could be helpful to women farmers than male extension workers.

- d) Women have little access to the benefits of research and innovation, Ahmad *et al.*, (1985) reported that women farmers' roles and needs are often ignored when devising technology which may cause labour displacement or decreased workload.

International initiatives and efforts, developed especially since the 1975 World Conference on Women in Mexico, have contributed to a greater recognition of women's key participation in rural and other domains of development. However, much remains to be done (IFAD, 1999). Joint ownership is a strategy to protect a woman's right to household livestock after a husband's death. Heifer Project requires the wife as well as the husband to sign its livestock contract, to prevent "property grabbing" by the man's relatives when he dies. Local authorities are asked to enforce the contract. Projects with polygamous families decide on the most equitable contracts to protect women's future livelihoods.

Some livestock schemes allocate animals only to women, assuming they make decisions independently and will improve their bargaining position by bringing wealth into the household. These projects are most successful when men are included in discussions of workload and benefits, so that the project does not increase women's workload but her husband takes the income. As with any form of micro credit, appropriation or domestic violence may occur when men's interests are not addressed. In Kenya, some women's groups maintain legal ownership of animals and may remove them from homes where a husband treats his wife badly (ILRI, 1997).

Women's livestock activities have the potential for great financial success, but they need strong financial training to avoid losing control to men when expanding their enterprises. Cooperatives have also helped many small-scale male farmers market their products, but may disadvantage women (IFPRI, 2001). If meetings are held when women are busy with

other tasks, they cannot effectively participate in decision making. Sometimes women form their own cooperatives. Other solutions include electing women to the co-op managing committee, or changing the rules regarding membership, payment, and meeting times. In Uganda and India, women opened group bank accounts that only they could access to receive their dairy payments (FAO, 1995).

Commercialization of livestock production can affect family nutrition and women's status if all of the milk, rabbits, or chickens are sold rather than used for home consumption. This risks increasing women's financial dependence on men by having to ask for money to purchase food they once produced.

Some livestock programs include human nutritional education and should address both men and women for the benefit of the whole household. Men can determine food distribution patterns, while women often only control food preparation (FAO, 1995). The Livestock Products Team of the FAO is making every effort to take into consideration the different roles and activities undertaken by men and women in all the aspects of the dairy chain. This approach is reflected in many field projects, where women are the main stakeholders and where women's groups are involved in enhancing capacity building and decision making power, as well as self-confidence. Good examples of gender balanced projects can be seen in the links given by FAO (1995).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Overview

This chapter outlines the methodology that was used in this study. The study area and its geographical characteristics are described in Section 3.2. Research methods are outlined and explained in section 3.3 included are the sampling procedure, sampling unit and sample size. Data collection, processing and analysis methods are presented in section 3.4.

3.2 Description of the study area

3.2.1 Location

The study was conducted in Arumeru district which is located South Eastern of Arusha region (Figure 2). The district is among five districts in the region, which include Arusha urban, Monduli, Ngorongoro, Karatu. The district has an area of 2996 km² and human population reaching 515,814 (females 263,671 and males 253,143) according to 2002 census (URT, 2003). The district has three distinct agricultural zones in accordance to the Selian Agricultural Research Institute as cited by Kalavo (2002), which are: “highland” (2000–2000m) characterized by banana/Coffee inter-cropping and semi-intensive livestock keeping. The second one is the “intermediate” zone (1500 – 2000m) with banana/coffee inter cropping and semi-intensive livestock keeping, and lastly the “lowland” zone (800 – 1500m) characterized mainly by cropping of maize and beans as well as extensive livestock keeping.

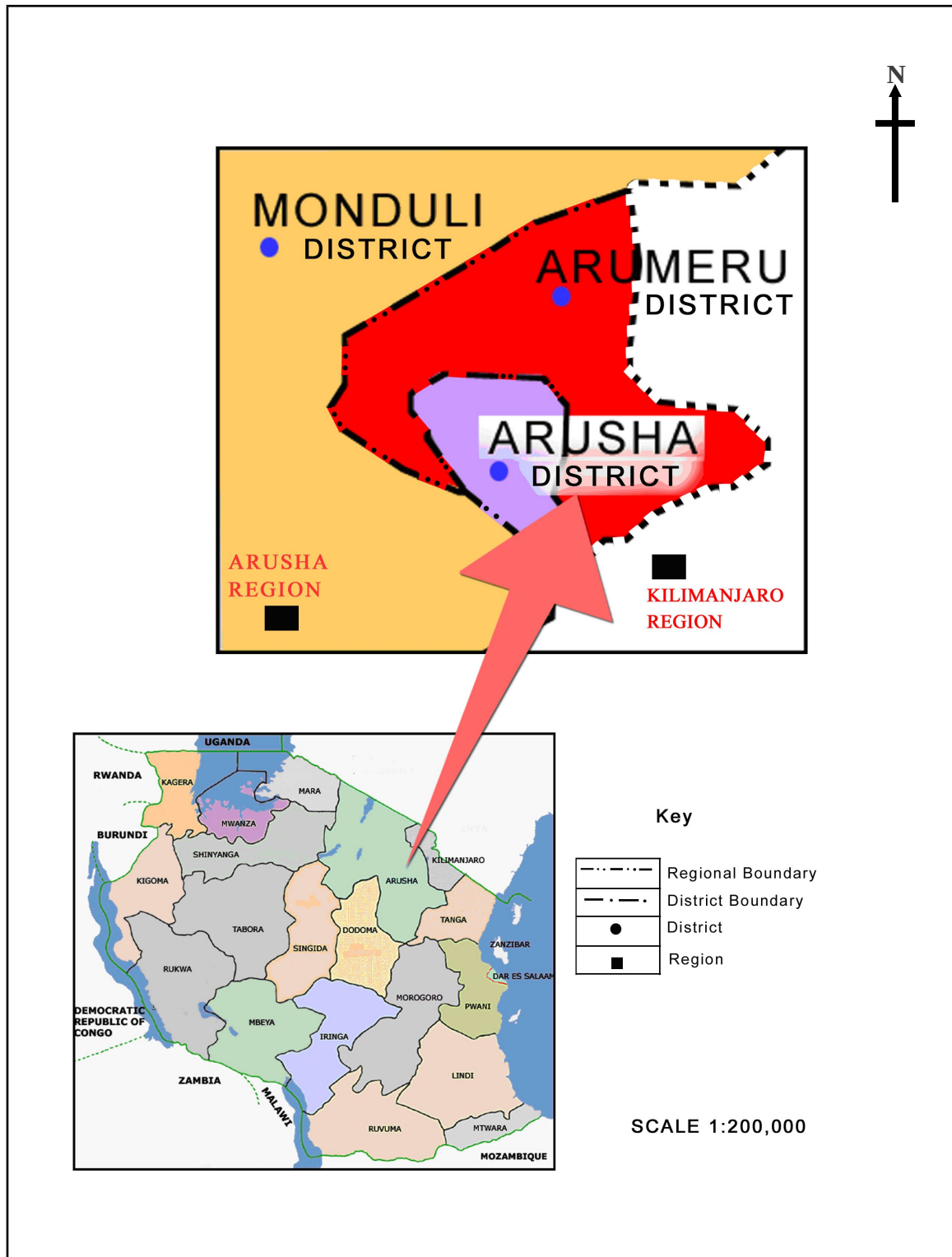


Figure 2 **Figure 3:** Map of Arumeru District, Tanzania

The district has a bimodal rainfall where by the major rainfall is during March to May, normally called the long rains, while the short rains start from November to December. Average annual rainfall varies from 1000 mm to 4500 mm. But there are significant daily, monthly and annual fluctuations in rainfall. (Arumeru District Profile, 2000). The climate is subtropical with cool season between May and August. There is warm climate in the low altitude and cool climate in high altitude areas. The average temperature ranges from 20°C-35°C. The soils of Arumeru area are predominantly volcanic with high moisture holding capacity, less alkalinity and soft subsoil, which results in good drainage (Arumeru District Profile, 2000). This area was purposively selected on grounds that many women keep dairy cattle and there is rapid increase in the formation of women groups.

Arumeru district is mainly composed of two ethnic groups, which are Waarusha and Wameru, whereby the former are found on the Eastern side of Mount Meru and the later on the Western side. (Arumeru District profile, 2000). Main activities in Arumeru district are livestock keeping and crop farming. The major system for livestock keeping is zero grazing. The crops grown in Arumeru district are banana, coffee, maize and beans and vegetables.

3.3 Research design

A cross sectional study design was used in which data was collected at one point in time. This design has been recommended by Bernard (1994) and Babbie (1990) because of its dual characteristics. Data collected can be used for the purposes of simple descriptive

statistics and interpretation and also make it possible to determine relationships between different variables that were in focus at the time of survey.

3.3.1 Sampling procedure

To obtain the representative sample for the study, purposive sampling technique was used to obtain four wards from East and West Arumeru. These are Bangata, Nkoaranga, Moivo, and Sokoni II. This technique has been recommended in social research by Kothari (2004) as it focuses directly to the area intended to be studied.

About sixteen villages in which women were involved in dairy production in groups and those not in groups were identified. Simple random selection was used to select six villages out of sixteen villages, which involved Bangata, Sasi, Ishupu, Enaboishu, Sokoni II and Nkoaranga. From each village simple random selection was then used to select 25 women. Finally, 150 women were interviewed.

3.3.2 Sampling unit and sample size

Households and women dairy farmer groups were the ultimate units of analysis since a household is considered as a basic unit of analysis when one tries to assess the level of poverty in the society. The total sample size was 150 respondents of which 79 were group members and 71 were non-group members. The choice of this sample size was based on the fact that a sample size of not less than 30 respondents is good for statistical inferences (Kothari, 2004).

3.4 Data collection

3.4.1 Primary data

To understand the role of group membership in determining income from dairy farming among women dairy farmers, and its importance, a social survey was conducted. Data collected cover aspects of dairy production, non-dairy income generating activities, the role of women farmers groups, and gender relations in dairy farming management, data were gathered on labour division in dairy management at the household level, access to resources (income and animals) and educational opportunities, and control explained as decision-making power over resources (income from dairy farming and animals ownership).

Tools used in collecting data included:

- Structured questionnaires
- Key informants discussion
- Reconnaissance

Structured questionnaire

Structured questionnaire was used to collect individuals' information at household level. A questionnaire with questions for women in groups and those not in groups was prepared and used accordingly. This is shown on appendix I. Questions designed for women group members focused essentially on information about dairy production, the role of women farmers groups and household income, consumption expenditure. In addition, the non-group members' questions requested information about dairy production, views on the women dairy farmers groups.

Key informant discussion

In this study, discussions with key informants were guided by a checklist (appendix II). An in-depth interview with key informants was carried out and was useful to collect information relating to policies and management issues. A key informant is an individual who has a great depth of knowledge about the issues in question, is accessible and willing to walk with the outsider. According to Metrick (1993), key informants are not only members of the clientele, but are most often informed outsiders. In this study, I shared information with a number of key informants for each village; among the key informants met were village chairperson and village secretary. Other meeting involved interview with leaders of all women dairy farmers groups, meeting with the project leader representative and finally meeting with the Arumeru District Veterinary Officer (DVO).

-Reconnaissance

Observation of some facts was carried out throughout the study period without the need of asking people. Data such as statistics for household, demography, size of each village were obtained at the village office registry during my introduction. Similarly personal observation was important for obtaining information such as: size of their farm plots, types of crops grown, number of animals kept, other animals kept, type of feed given to livestock, animal keeping system etc.

3.4.2 Secondary data

This involved published reports from projects/Institutes that work in Arumeru District e.g. Heifer International Project and Land O lakes. More information was collected from textbooks, Sokoine National Agriculture Library (SNAL) and Published Journal articles.

3.4.3 Data analysis

Data from completed household interviews were sorted and categorized into groups to enable easy coding and analysis. Quantitative data analysis was done using SPSS (Version 11.5) computer programme. Descriptive statistical analysis (percentage and means) was carried out to measure central tendency and dispersion for understanding the distribution of responses from the participants. *T*-test analysis was used to compare income from women in groups and those not in groups. *Chi*-square was also used to compare distributions of variables among two groups for instance, access and control in gender relations analysis. Regression model was also used to determine the influence of group membership on the income obtained from dairy farming and control for potential confounding variables.

The regression model used was $Y = a + b_1X_1 + b_2X_2 + \dots + b_jX_j + e_i$

Where: Y= is income from dairy farming

a = Constant, the b's are the regression coefficients,

X_1 = Education level

X_2 = Household size

X_3 = Number of dairy cattle

X_4 = Price per litter

X_5 = Market availability

X_6 = Amount of milk sold per day

X_7 = Advise on good husbandry

X_8 = Group membership

Qualitative data were analyzed by carrying out content analysis. This type of analysis is useful in analyzing details of the components of verbal discussions held with key

informants (Kajembe, 1994). The recorded dialogue with the respondents was broken down into smallest and meaningful units of information or themes and tendencies.

3.5 Limitation of the study

During the study the following problems were encountered;

- a) Some respondents were not fully willing to give information because previous researchers had not fulfilled their promises. I explained to them the purpose of my research, and being accompanied by the ward livestock officer in data collection this managed to alleviate the problem, because of his good rapport with villagers.
- b) Women dairy farmers were reluctant to mention their real income and assets because of the fear of being taxed by the government. However, information were obtained by asking some questions on milk production per day, how much is sold per litter, and finally calculations were done to get the total annual income.
- c) In some cases, community events interrupted the survey exercise, these included funerals, village open market day, involvement of village leaders in public or emergency meetings as well as low commitment of research assistants.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This chapter presents the findings of a study conducted in four wards in the eastern and western parts of Arumeru district, Tanzania. The chapter is divided into the following sections: sample characteristics; income obtained from dairy farming and other sources; comparison of income between women in groups and those not in groups and gender relations in dairy farming.

4.2 Sample characteristics

The selected sample for the study comprised of 79 women who were members of women dairy farmers groups and 71 women dairy farmers who were not members of any dairy farmers' group. The variables examined in the study included age, marital status, level of education and household size.

4.2.1 Age

Distribution of age from the study sample is presented on Table 3. The results show that the majority of the entire sample (78 %) was in the following age categories 34 -41, 42- 49 and above 49.

Table 4Table 5: Distribution of respondents by age (N=150)

Age group_ (Yrs)	% WIG	% WNIG	%Entire— sample	Chi-square
18-25	3.8	4.2	4.0	P=0.137

26-33	16.5	19.7	18.0
34-41	16.5	32.4	24.0
42-49	34.2	35.4	30.0
Above 49	29.1	18.3	24.0
Total	79.0	71.0	150.0

Source: Survey 2006

The results show that the majority (78 %) of the respondents were in the age group of 34 to more than 49. For women in dairy farmers group (63.3%) were between 42 to above 49 years, whilst (53.7%) of women not in groups were in the same age range. The age distribution across the two groups was not statistically different ($P > 0.05$). The majority of these women dairy farmers were in their middle age. This was confirmed by the mean age of the respondents, which was 43 years and the upper age limit in the entire sample was 75 years old. The respondents were within the economically productive age range for Tanzania of between 15 and 64 years (Mandara, 1998).

4.2.2 Marital status

Table 7: Distribution of respondents by marital status (N=150)

Category	WIG %	WNIG %	Entire sample %	Chi-square
Married	82.3	85.9	84.9	P=0.155
Single	5.1	0.0	2.7	
Divorced	2.5	0.0	1.3	
Separated	2.5	1.4	2.0	
Widowed	7.6	12.7	10.0	
Total	79.0	71.0	150.0	

Source: Survey 2006

Study results show that the majorities (84.9%) of women in the entire sample were married (Table 4). This includes 82.3% women in groups and 85.9% of those women not in groups. It is very likely that in the ethnic, marriage is highly valued and this would probably hold true for most Tanzanians. On the other hand marriage is one of the leading

factors considered to be the cause of women having limited access to and control over resources, particularly in rural areas where the majority of women live (Mongi, 2005).

4.2.3 Education level

Education has always been valued as a means of liberation from ignorance and it enables a person to perform non-traditional roles (Mongi, 2005). The study results in Table 5 revealed that the majority (75.3) % of the respondents had attained primary education. Harris (1971) in his study urged that basic literacy and numeracy are also essential for efficient management of a business. The ability to read and write is an advantage due to the fact that training for a business operation can be achieved more easily if the farmer is educated.

Table 8Table 9: Distribution of respondents by level of education (N=150)

Category	WIG %	WNIG %	Entire sample %	Chi-square
No formal schooling	16.5	18.9	17.3	P=0.219
Primary school	72.2	78.9	75.3	
Secondary school	8.9	1.4	7.3	
Post secondary	2.5	1.4	2.0	
Total	79.0	71.0	150.0	

Source: Survey 2006

The high literacy rate in the entire sample indicates that most of the respondents know how to read and write. The literacy rates were similar between the farmers in groups and those not in groups ($P>0.05$). Such a considerable high rate of literacy is an important input, which may enable local people to be aware of and to understand and adopt new technologies more easily, hence creating necessary strategies for avoiding and fighting against poverty in their localities. Makauki (1999) found that knowing how to read and write was sufficient for a person to successfully adopt new technologies, whose

dissemination demand simple leaflets, pamphlets, posters newspapers or other simple written materials.

4.2.4 Household size

Household size was determined by considering all members present in each household, including parents, children and dependants, as shown in Table 6.

Table 10Table 11: Distribution of respondents by household size (N=150)

Category	WIG %	WNIG %	Entire sample	Chi-square
Small size(1-4)	24.1	32.4	28.0	P=0.17
Large size>5	75.9	67.6	72.0	
Total	79.0	71.0	150.0	

Source: Survey 2006

In this study, a family consisting of at least four members or less was considered to be a small family, whilst a family with more than five members was considered as a large family. The study showed many households being in a large family group, with an average of 5.4 family members. The household size is not significantly different between the two women group types ($P>0.05$) and slightly above the national average household size of 4.7 (Census Report, 2002).

4.2.5 Distribution of estimated income per annum

Study findings (Table 7) show that majority (57.3%) of the respondents reported their estimated annual income to be TShs 300, 000 and above. The estimated annual income is obtained from dairy farming, non-farm activities, crop farming and salaries for those who are employed. The distribution of women across the income brackets did not differ between the women in groups and those not in groups ($P>0.05$).

Table 12: Distribution of estimated income per annum (N=150)

Category (TShs)	WIG %	WNIG %	Entire sample %	Chi-square
> 100,000	8.9	11.3	10.0	P= 0.662
100,000-300,000	30.4	35.2	32.7	
Above 300000	60.8	53.5	57.3	
Total (n)	79.0	71.0	150.0	

Source: Survey 2006

4.3 Dairy farming and other economic activities undertaken by women dairy farmers

The majority (90%) of women in Arumeru district keep two dairy cattle (Kalavo, 2002). The management system used is zero grazing and the average milk production is 8.6 litres per day. The milk produced is sold at an average of TShs. 260 per litre. The women dairy farmers have relatively good market for their milk about 95.8% of women sell their milk as raw milk to milk vendors in the village and nearby towns and some few to processing plants.

Results (Table 8) present the proportion of individuals, by annual income obtained from dairy farming, in sampled villages in Arumeru district.

Table 13: Distribution of respondents by annual income obtained from dairy farming (N=150)

Category(TShs)	WIG %	WNIG %	Entire sample %	Chi-square
0-150000	3.8	7.0	6.0	P=0.01
150000-299999	21.5	46.5	33.3	
300000-449999	34.4	25.4	30.7	
Above 450000	39.2	21.1	30.0	
Total (n)	79.0	71.0	150.0	

Source: Survey 2006

The results indicate that majority of farmers (74%) in the entire sample receive dairy income which ranges in the following TShs categories 150,000- 299,999, 300,000-449,999 and above 450,000 from dairy farming. Findings also show that (73.6%) of women in groups receive from 300,000-449,999 and above 450,000. But for the case of women not in group, the majority (71.9%) obtained income which ranges 150,000 to 299,999 and 300,000-449,999.

Information derived from this study show a statistical significance ($P < 0.05$) in the distribution of income from dairy farming amongst women who belong to groups and those who do not belong to groups. Kurwijila and Henriksen (1995) reported that the bulk

milk available in towns is either produced within the urban areas or brought in by milk vendors, who operate within a 40 km radius. This was also reflected in this study where women dairy farmers, find suitable milk markets in Arusha town and nearby sub-towns, such as Tengeru, Usa River and Kilala.

Apart from dairy production, women in Arumeru district are also involved in other economic activities to supplement household incomes. Table 9 show different economic activities apart from dairy farming, which are carried out by women in Arumeru district.

Table 14: Other sources of income generating activities in Arumeru district

Income generating activities	Freq	%
Selling bananas	83	39.0
Selling local chicken	34	16.0
Selling coffee	15	7.0
Selling maize	20	9.4
Selling second hand clothes	3	1.4
Selling horticultural products	40	18.7
Tailoring	1	0.5
Small shops	17	8.0
Total	213	100.0
Source: Survey 2006		

Results show that, generally, women are involved in selling bananas, vegetables, fruits and local chicken. These activities integrate well with the agricultural production system, which dominate this area. Meru home gardens are similar to the well known Chagga home gardens and agro-forestry practices, whereby a farmer is able to produce crops and raise livestock in the same plot at the same time.

According to Nair and Graetz (2004), there are many advantages claimed for these multi-species, multi-storey home gardens, including soil conservation, nutrient cycling and labour efficiency, risk minimization and continuous production. Similarly, Mwasha (1998)

reported that, in Tanzania, vegetables are typically grown on a rather small scale. However, horticultural crops usually generate higher earnings per unit area and represent an alternative income for farmers, whose cultivable land is too small to provide an adequate income from only field crops.

Apart from bananas being the main food and raw material for the local brew (*mbege*) amongst people in Arumeru, demand for bananas and horticultural products has been increasing in this area. This has been due to an increase in large tourist hotels and lodges in Arusha and nearby regions, such as Manyara and Mara.

Information obtained from this study as shown in Table 10, reveal that income generated from other activities show no statistical significant difference between women belonging to groups and those not in groups. An explanation for this finding could be because both categories of women experienced similar farm management practices and they had similar market opportunities.

Table 15: Distribution of respondents by annual income obtained from other income sources (N=150)

Category(TShs)	WIG %	WNIG %	Entire sample %	Chi-square
0-150000	32.9	54.9	43.3	P=0.06
150000-299999	31.6	19.7	26.0	
300000-449999	13.9	11.3	12.7	
Above 450000	21.5	14.1	18.0	
Total (n)	79.0	71.0	150.0	

Source: Survey 2006

4.3.1 Importance of income from dairy farming for women farmers in Arumeru district

Table 11 presents distribution of importance of several income sources among respondents.

Table 16: Distribution of women farmers by importance of dairy farming (N=150)

Category	WIG %	WNIG %	Entire sample %	Chi-square
Employment	6.3	4.2	5.3	P=0.764
Non farm activities	6.3	9.9	8.0	
Dairy farming	59.5	54.9	57.3	
Crop farming	27.8	31.0	29.3	
Total (n)	79.0	71.0	150.0	

Source: Survey 2006

Findings show that among women in households keeping dairy, dairy farming is given higher priority followed by crop farming, while employment and non farm activities are of less importance. It is likely that dairy products bring more revenues to such households in Arumeru and hence it has more contribution to meet various household demands. Figure 3, shows that most of the respondents revealed that income from dairy farming made a significant contribution to their total household income, the results show that the percentage of dairy income contribution to household income range from 20-100%. However, the average contribution of dairy farming to household income was 64%. This is also supported by Kurwijila (2002) that dairy farming has the potential to contribute even more to household income and food security.

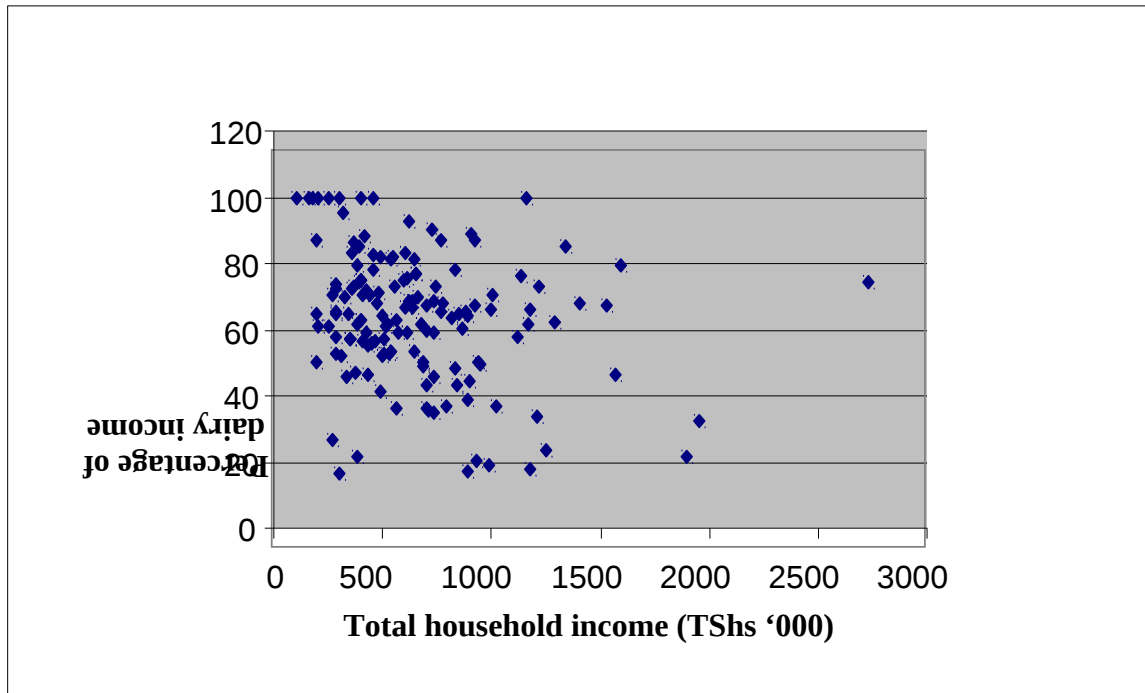


Figure 4: Scatter plot showing contribution of dairy farming to household income

Income generated from dairy production was used to meet several household needs as indicated in figure 4, hence improvement in their level of wellbeing. The same observation has been made by Urassa and Raphael (2000), Masako [\(2002\)](#), and Kalavo (2002) who urged that, in Tanzania, money from the sale of animal products or live animals has been used to meet various household expenses, including health, education, house construction, food for families and other expenses. The percentage for food is much higher (53) than other expenses which can perhaps explain the economical status of women in Arumeru district, since for poor people they have limited budget and spent most of their money in food expenses. This was also supported by Budak *et al.*, [\(2005\)](#) that the poor generally spend large fractions of their budgets on food expenses.

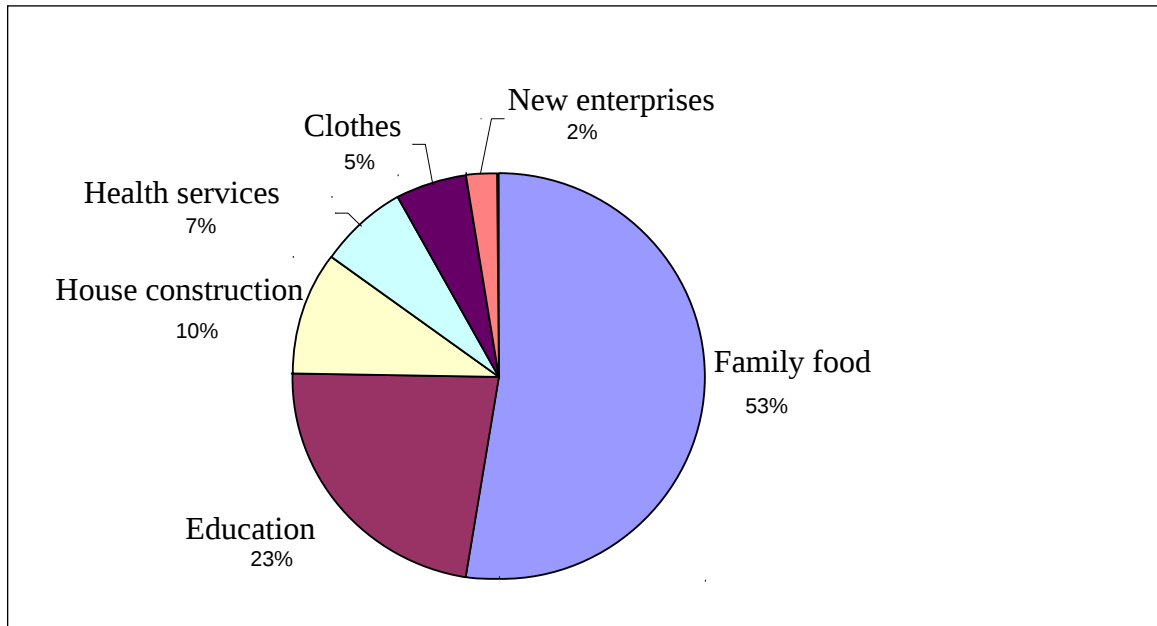


Figure 5: Dairy income consumption and expenditure

4.3.2 Association between total household income and income from dairy farming

Correlation between dairy farming income and total household income was done to see the association between the two. Results show that dairy income has strong correlation with total household income at ($P < 0.01$). ~~Table 12.~~ This was in agreement with Boi (2004) who found that the mean correlation between livestock income and total household income was the highest among the three income sources which were analyzed, i.e. non farm activities, crop farming and livestock income.

Table 17: Correlation of dairy farming to household income

Variable	P
Total from household income	1.000
Income from dairy farming	0.634**
Source: Survey 2006	
** Correlation is significant at the 0.01 level (2-tailed).	

4.3.3 Contribution of dairy farming to household well being

Respondents were asked to state whether their income increased or decreased after engaging in dairy production. As shown on Table 132, majority (88%) of respondents revealed that participating on dairy production have improved their household income.

Table 18Table 19: Effect on household income after engaging in dairy production

Category	Proportion (%)
Increased	88
Decreased	8
No change	4
Total	100

Source: Survey 2006

The income obtained from dairy farming helped them pay school fees for their children and other dependents, in addition to buying food and other family needs. It also helped towards house construction and health services. This observation compares well with the study conducted by Hanyani-Mlambo *et al.*, (2002) on socio-economic aspects of smallholder dairying. It was mentioned that income obtained from dairy enterprise is a supplementing to households needs.

It was learned from District Veterinary Officer of Arumeru that, for those whose income has decreased was due to some factors as possession of poor yielding breeds, lack of good animal and failure to meet vet cost which in total bring less income than cost incurred.

4.4 Effect of group membership on dairy farming income

Regarding the second specific objective of this study, data were collected for the income obtained from dairy farming per annum between women dairy farmers who are in groups and those who are not in groups. Results are presented in Table 143 for the independent *t*-test carried out to compare the average income between women in groups and those not in groups and the results in Table 14 show the output of the regression model used to determine the relationship between group membership and income from dairy farming.

Results in Table 13 reveal that there is a difference in the annual average income obtained between women in groups and those not in groups. However, the difference is not statistically significant ($P > 0.05$). Despite of these results, it does not imply that groups

formation do not have any importance in the society; there are other benefits which can be obtained when women are in groups. According to Grootaert (2001, who argued that, group formation can contribute to building social capital, and this, in turn, can have positive effects on human welfare, especially as a result of income generation among the poor.

Table 20Table 21: Comparison of dairy income between women in groups and those not in groups in Arumeru district (N=150)

Variable		Mean (TSHS)	Se	T	df	P
Income	Women in groups	434_830.40	30_989.10	-1.799	148	0.06
	Women not in groups	360_238.70	26_571.20			

Source: Survey 2006

A regression model was used to test whether there is a significant covariation between group membership and dairy income. Potential confounding factors were controlled by including them in the model. The studied predictors were; education level; household size; amount of milk sold; the price of milk per litre; market availability; advice/consultation; and group membership.

From the regression model, it was observed that the above-mentioned factors in statistical interpretation can explain the influence on the income from dairy farming because none of the standard coefficients were exactly equal to zero. Also, the regression model explained 72.9% of the variations in the factors affecting the dairy income, as the R^2 signify (Table 154).

After controlling for the potential confounding factors the results showed that group membership had no effect at ($P > 0.05$) on the average annual income from dairy farming

(Table 154) agreeing with the results obtained in Table 143. The reason for this could be because many of these groups were still in their infancy and most of the women in groups were poor. Likewise, the groups were facing some financial problems for their operations which potentially hinder speedy improvement.

Table 22

Table 23: Effect of group membership on income from dairy farming

Model summary					
Model	R	R Square	Adjusted R	Std Error of the estimate.	
1	.854	.729	.712	.30468	

Coefficients					
Model	Un-standardised Coefficients		Standardised Coefficients		
	B	Std Error	Beta	T	Sig
(Constant)	10.655	.300		35.563	.000
Level of education	-.088	.075	-.056	-1.172	.243
Household size	.155	.061	.119	2.526	.013
Price per litre	.005	.001	.329	6.807	.000
Amount of milk sold	.147	.010	.729	14.953	.000
Number of dairy cattle	-.060	.042	-.069	-1.437	.153
Market availability	.111	.156	.032	.711	.478
Consultation/advice	-.162	.071	-.114	-2.279	.024
Group membership	.155	.061	.119	2.526	.918

Source: Survey 2006.

The results also show that four of the seven predictors included in the analysis, i.e. the household size, amount of milk sold (litres), the price per litre (TShs), consultation (advice in dairy management), were significant, as shown in Table 14 and at ($P < 0.05$) this implies that these four predictors had an impact on the income from dairy farming in the study area, rather than other factors. Therefore, improvement in these predictors will bring an increase in the income from dairy farming, at magnitudes indicated by their respective coefficients and hence demonstrate their importance in determining income from dairy farming. The amount of milk (litres) sold were the highest predictors of the income from dairy farming value of $\beta = 0.729$, with an un-standardized regression coefficient (B) of

0.147, whilst the price of milk sold per litre was the second predictor (beta = 0.329 with B=0.005). Household size (beta=0.155 with B=0.119) was the third predictor and consultation/advice in dairy farming practices came fourth with negative coefficients (beta=-0.162 with B=-0.114). The remaining predictors were not statistically significant confounding factors for the relationship between group membership and income from dairy farming ($p>0.05$).

Interestingly the coefficient sign on consultation was negative, perhaps consultation could have unexplained reason(s) related to dairy farming management in this particular study, more study is suggested on this variable. The household size in this study has the effect on the dairy income this may possibly be reflected to labour availability in management practices which in turn improves the level of production. This was also supported by Mapiye *et al.*, (2006) and Hanyani-Mlambo *et al.*, (1998) that family size has been asserted as the most important determinant of labour investment and a source of labour for family farms. Msechu, (1988), observed that the reason behind poor performance of dairy sector in Tanzania is due to low milk producing zebu cattle, a relatively small improved dairy herd producing below potential, low purchasing power and cultural food consumption habits.

Findings from interviews with respondents who are in groups, showed that, there are several benefits which are obtained by being a member of dairy farmers groups. The main ones are indicated in Table 165

Table 25: Distribution of respondents in relation to the benefits obtained through groups formation

Group benefits	Proportion to individuals	
	No	%
Obtaining a loan	38	48.1
Benefits of training on good husbandry	17	21.5
Benefits from receiving a cow from donors	16	20.3
Benefit from development challenges	7	8.8
Total	79	100.0

Source: Survey 2006

Majority (48.1%) of respondents reported to benefit from obtaining loans, whilst 21.5% of the respondents benefit from training on good husbandry practices. In addition to this, 20.3% of the respondents benefit by receiving a cow from donors, and the remaining 8.8% reported that group membership raise challenges towards development. Women's empowerment is strengthened through group action and support. Group discussions help communities explore women's decision-making power, especially over large and valuable animals, so that men do not feel threatened. Facilitation by a respected leader or professional helps clarify the benefits (ILRI, 1997).

4.5 Women groups

4.5.1 Women groups surveyed

Group members, interviewed during the survey came from seven groups of women dairy farmers. These included: Endukuya, Umoja, Baraka, IDAFASO, Zero grazing and Wito farmers'. Slightly less than one half (43%) of these groups were established in 2001.

During the study, it was found that the extent and size of the groups differed only very slightly. Majority (98%) of the groups had 20 members and they were advised by the officers from Arumeru district. The key reason given by group members and organizations for preferring small groups was that it is easier to manage small groups, rather than a

larger group or individuals. In addition, some respondents commented that it is easier to build up solidarity of small groups and hence it is easier to come up with a common vision and mission amongst the group (Mongi, 2005).

4.5.2 Objectives of forming groups

Study findings showed a number of objectives towards the formation of women's groups. Among them are access to loans, grants and training (Table 176).

Table 26Table 27: Distribution of respondents in relation to the objective of forming groups

Group formation objectives	Proportion to individuals	
	No	%
Access to loan and grants	28	34.8
Access to training and workshops for dairy management	27	34.3
Easy access to markets	24	30.0
Total	79	100.0

Source: Survey 2006

Initially, the members appreciated that working as a team increased the capacity of people and as a result they decided to join together in order to enhance their livelihood. Study findings revealed further that 34.8% of member respondents commented that the main objective of starting their group was to access loan and grants, in order to obtain capital for their development. On the other hand, 34.3% of the respondents said their main objective was to access training and workshops for dairy management, whilst slightly less than a third (30%) of the respondents said that probably their major objective was to gain easy access to markets. The percentages are almost the same, which indicate that all responses have equal weights. While for women who do not belong to any group will have limited or no access to those services mentioned.

4.5.3 Group initiatives

In the study, member respondents were asked to state whether the groups were started on their own initiatives, by NGO's and projects, or by learning from other women.

Table 29: Distribution of respondents in relation to the objective of forming groups

Reasons for group initiation	Proportion to individuals	
	No	%
Own initiatives	52	65.8
Learning from other women	22	26.6
NGOs and projects	5	7.6
Total	79	100.0

Source: Survey 2006

Findings in Table 178 show that, majority (65.8%) of respondents reported that their groups were formed through their own initiatives. They decided to form their groups in order to support one another in different social activities. It can be argued that women are quick to respond with development ideas to fight poverty. From this study that 26.6% of respondents reported that their groups were formed through learning from other women while, only few (7.6%) of the respondents reported that their groups were initiated by NGOs and projects.

4.5.4 Group registration

Registration of a group is very crucial for the identification of that group amongst the donor communities, private institutions, Non Government Organizations and the Government, in addition to the grassroots communities in rural areas (Mongi, 2005). Registration of a group gives it a legal status. Furthermore, experience shows that donor agencies prefer to support groups, which are legally registered. TGNP (1993), suggested formal group or organization should get itself registered, to enable it to receive credit, set up a bank account or other important activities that will give a group the status of being trusted, particularly by donors and other financial institutions.

During the survey, all the groups interviewed mentioned that Arumeru District Council had registered their group. However, group leaders reported that the registration involved a long process, which had to be followed, and hence it consumed a great deal of the respondent's time. Therefore, in order to speed up the development, there is a need to review some of the conditions and procedures required for community based groups, particularly for the registration of women's groups, in the understanding that such groups are development catalysts in their own area.

4.5.5 Requirements for joining groups

It was noted that each group had a constitution which provide guidelines for interested individuals to follow once joining the group. However, such procedures did not vary much from one group to another.

Table 30Table 31: Distribution of respondents by the requirements to join the group (n=79)

Requirement	Freq	%
Should pay entrance fees	68	49.6
Should be ready to attend group meetings	24	17.5
Should pay monthly fees, be accountable, agree with GP	25	18.2
Should have a dairy cow	20	14.6
Total	137	100.0

Source: Survey 2006

Table 198 shows various requirements set by group leaders and some representatives, for a person to join a women's dairy farming group. It was observed that 49.6% said that it was necessary for a person to pay entry fees since; the groups were just starting and needed some start up capital, which could then be used for group activities. Members were required to have a dairy cow(s) or showing interest of keeping a cow particularly for those

who could not afford buying a cow, as the NGO's (Global Partners) was ready to provide to women as part of the project's objective.

4.5.6 Problems encountered by groups

In this study, it was found that women groups in the study area have been facing various problems. Some of the problems mentioned, by respondents, included: members' irregular attendance and coming late to group meetings; lack of capital; unwillingness to make a contribution to the group: and lack of joint enterprises. Study results as shown in Table 2019 show that more than one half (58.4%) of respondents are concerned about irregular attendance and members coming late to group meetings.

Table 32Table 33: Distribution of respondents by group challenges

Group challenges	Freq	%
Irregular attendance to group meeting	45	58.4
Lack of capital	14	18.2
Unwillingness to contribute to the group	13	16.9
Lack of joint enterprises	5	6.5
Total	77	100.0

Source: Survey 2006

4.5.7 Opinions on women farmers groups

Study respondents were asked to give their opinion on women dairy farmers' groups. The majority (59.3%) of the respondents revealed that these groups are beneficial for women's development, and make them to feel more empowered. According to ILRI 1997, group discussions help communities explore women's decision-making power, especially over large and valuable animals, so that men do not feel threatened. Facilitation by a respected leader or professional helps clarify the benefits.

4.6

Gender relations in management of dairy farming

4.6.1 **Division of labour**

Results on gender division of labour at the household level, on dairy management activities in Arumeru district are presented in Table ~~24~~20.

Table 34 **Table 35: Distribution of respondent's gender division of labour at the household level**

Who is involved (%)	Activities						
	Milking morning	Milking evening	Cleaning barn	Grass cutting	Feeding	Watering	Fetching feeds
Women	76	78.7	61.3	39.3	46.7	46.7	44.7
Men	0	0.0	0.7	1.3	0.7	0.0	0.4
Boys	0	0.0	0.0	0.0	0.0	0.0	0.7
Girls	0.7	0.7	0.7	0.7	0.7	2.0	2.6
Hired labour	0.7	0.7	5.3	5.4	5.3	3.3	2.0
Women and girls	10.7	9.3	16.0	15.3	10.7	10.7	15.6
Women and hired labour	8.7	8.0	7.3	7.3	7.2	7.3	7.3
Women and men	3.2	2.7	8.7	30.7	28.7	30.0	26.7
Total	100	100.0	100.0	100.0	100.0	100.0	100.0

Source: Survey 2006

Study results indicate that, in each dairy management activity women in Arumeru contribute more proportion of labour and time than other household members followed by female child. On other hand men and male children contribute relatively low. The reason behind this observation is due to fact that, livestock management roles are traditionally carried by women among Wameru ethnic society. According to information obtained from the District Veterinary Officer, husbands are involved in dairy production in some specific duties such as consulting veterinary services, sales or purchases of animals.

These study results are supported by those conducted by FAO (1995) and IFAD (1999), which observed that women traditionally carry the major responsibility for both domestic work and subsistence agriculture, especially food crop production, livestock and fishing, as casual labourers and spend more hours per day than men in both productive and reproductive activities.



Figure Plate 6Plate 1: A woman at Nkoaranga village milking a cow

According to Lane (1991), research findings on feeding systems, indicate that feeding, cleaning and milking of dairy animals are done mostly by women (Plate 1). Most of the work involving livestock management is considered the traditional responsibility of women. The study done by ILRI (1997), Kenya National Dairy Development Project showed that, while 84 percent of the farms included in the study were owned by men, 84 percent of the dairy operators were women. Similarly, Beth₅ (2001) observed that women usually provide most of the labour for stall-fed dairy cattle and other animals kept near the home, but may not realize benefits commensurate with their contribution, limiting their incentive to increase production.

4.6.2 Access and control of an animal in dairy farming

Results on access to and control of an animal are presented in Table 22₁. The findings show that there are differences in ownership and control of an animal between women-

categories. Those who are in groups seem to have power than their counterparts who are not in group. However, access of an animal is not statistically significant at ($P>0.05$). Although, considering the control of an animal and ownership, women in groups have more control (30.4%) than women not in groups (16.9%) this is statistically significant at ($p<0.001$). The probable reason could be due to the fact that majority of women in groups own dairy cows, which were given by the NGO (Global Partners).

Table 37: Distribution of respondents by access, ownership and control of animals (N= 150)

Category	Access			Control		
	WIG %	WNIG %	Entire sample%	WIG %	WNIG %	Entire sample%
Husband	17.7	26.8	22.0	36.7	73.2	54.0
Wife	30.4	18.3	24.7	30.4	16.9	24.0
Husband and wife	51.9	54.9	53.3	32.9	9.9	22.0
Total (n)	79	71.0	150.0	79.0	71.0	150.0
Chi-square (P-values)	0.16			0.001		
p-value						

Source: Survey 2006

The study results imply that group membership give more opportunity to have access and control over animals in the dairy enterprise in Arumeru district. Women benefit when they have decision-making power about the animals they manage, even without legal ownership rights. A study carried by IFPRI (2001) revealed that it is common for women to operate a productive enterprise with smaller animals such as goats, sheep, poultry, and pigs, since the initial costs are lower and profits may be low, and men are less likely to interfere. Men prefer to own larger animals such as dairy cattle because they are more profitable and bring greater personal status.

According to the interview conducted, the respondents revealed that several NGOs such as Global Partners and Heifer Project International (HPI) have assisted women to obtain dairy cows in some villages in Arumeru district at lower cost and simple arrangements.

Study results obtained in Arumeru are well supported by the study conducted in Kenya by Beth (2001), who found that some livestock schemes allocate animals only to women, assuming they make decisions independently and will improve their good position by bringing wealth into the household. Beth, (2001) also found that some women's groups maintain legal ownership of animals and may decide to remove the animals from homes when a husband treats his wife badly and also women's empowerment as well as women's decision-making power, especially over large and valuable animals such as cattle is strengthened through group action and support.

4.6.3 Access and control of income in dairy farming

Researches done by FAO, (2005) in Africa, Asia and Latin America has found that improvements in household food security and nutrition are associated with women's access and control of income and their role in household decisions on expenditures. This is because women tend to spend a significantly higher proportion of their income than men on food for the family. Results on access and control of income from dairy in Arumeru district are presented in Table 232.

Table 38Table 39: Distribution of respondents in access and control of income from dairy farming

Category	Access			Control		
	WIG %	WNIG %	Entire sample%	WIG %	WNIG %	Entire sample%
Husband	19.0	59.2	38.0	31.6	59.2	44.7
Wife	39.2	15.5	28.0	35.4	26.8	31.3
Husband and wife	41.8	25.4	53.3	32.9	14.1	24.0
Total (n)	79.0	71.0	150.0	79.0	71.0	150.0
Chi-square (P-values)		0.01			0.02	

Source: Survey 2006

Findings from this study shows that women in groups are better off in terms of having access ($P \leq 0.05$) and control ($P \leq 0.05$) of income obtained from dairy production than their counterparts who are not in groups. Likewise women in groups have more access and control of the income than their respective husbands contrary to women who are not in groups. Variation observed in the results reveal that women members have advantage in controlling household resources and reduced men dominance tendencies. Following interviews with the District Veterinary Officer, it was further noted that, in most of Wameru and Waarusha men are the ones who traditionally control income from dairy farming.

Findings from this study are also supported by studies conducted by FAO (2005) and IFAD (1999), which found that improvements in household food security and nutrition are associated with women's access to income and their role in household decisions on expenditure, whereas men tend to use their income for longer-term investments and entertainments.

In addition, results in this study imply that when women are well integrated or involved in managing household projects, their capacity over decision making is also improved. This

is supported by a study conducted by Beth (2001) who observed that women benefit most, when they have decision-making authority about the animals they manage and milk sales even without legal ownership rights.

4.6.4 Access to education, training opportunities, and extension services

Women's limited access to education, training and extension services force them into a subordinate role, to the detriment of their own development and that of society as a whole (FAO, 1995). The results on the distribution of the respondent's access to education, training and extension services are presented in Table 234.

Table 41: Distribution of respondent's in access to education opportunities, training and extension.

Category	WIG %	WNIG %	Entire sample%	Chi-square p-value
Husband	15.2	31.0	22.7	
Wife	75.9	60.6	68.7	
Husband and wife	8.9	8.5	8.7	
Total (n)	79.0	71.0	150.0	0.06

Results shows that majority (75.9%) of women in groups have access to training compared to their colleagues (60.6%) who are not in groups. However, the distribution among the two groups was not statistically significant at ($P \geq 0.05$). Also the findings reveal that access to education opportunities and extension services is reaching more men in households whose women are not member of dairy farming groups. The difference observed in this study reveal that group membership gives women more opportunities over education, training and extension services related to dairy farming. According to Arumeru District Veterinary Officer, women in Arumeru district have access to training provided by training centres such as Tengeru Livestock Training Institute (LITI), National Artificial

Insemination Centre (NAIC) and those conducted by other development agencies such as Heifer Project and various progressive farmers in Arusha. Women's limited access to education, training and extension services force them into a subordinate role, to the detriment of their own development and that of society as a whole.

Two thirds of the 1,000 million illiterates in the world are women and girls. Available figures show that only 5% of extension services have been addressed to rural women (FAO, 1995), training in animal health and management, and access to Veterinary care can control animal diseases that reduce productivity, especially with exotic or crossbred animals (IFAD, 2001). According to Beth (2001), animal distributions without technical training have limited success. Technical training helps women ensure that their rights to livestock lead to increased food, income and decision making power.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the results obtained and the subsequent discussion, the following main conclusions can be drawn:

- (a) Majority of women in Arumeru district practice dairy farming as their major source of income, followed by production of crops such as vegetables, bananas, maize and beans. On the other hand, some have engaged themselves in non agricultural activities though at a small scale, these include; tailoring, owning small shops and selling second hand clothes etc.
- (b) Income obtained from dairy farming is the major contributor to the total household income than other income generating activities. The income from dairy farming mainly used to meet daily needs such as food, education and health services.
- (c) It has been noted that some women have formed groups known as women dairy farmers groups while some are yet to join these groups. Women in groups have revealed to enjoy several benefits in the dairy enterprise, these include; easy access to small loans, dairy management training, study tours, acquiring dairy cows from donors, and other opportunities.
- (d) It was determined that the average annual dairy income obtained by women in groups is slightly higher than those not in groups, but the difference was not statistically significant. However, the group membership empowered women to

gain control over livestock and be in a better position to have access and control over the income obtained from dairy farming.

- (e) Despite of several benefits that accrued from dairy production at household level, women still bear more burden in this enterprise such as fetching animal feed, milking, cleaning barn and marketing of milk products. It was also observed that, girl children were also involved a bit more than men and boys.
- (f) Access and control of income from dairy production was not proportional to individual's input. It was worse for women who were not in groups whereby their husbands had more access and control over income obtained from sales of dairy products.
- (g) Women in groups were likely to be empowered in several aspects such as production, management and decision making over revenues obtained from sales of products.

5.2 Recommendations

- (a) Since dairy farming is the main contributor to the household income in Arumeru district, there is a need to improve milk production as the demand is still high within Arumeru and nearby cities. Women should aim high on increasing milk production by acquiring more improved breeds and practice good management systems. In addition, it is important to ensure good milk quality which can be achieved through hygienic milking, storage and transportation.

- (b) Given the benefits of dairy groups, women who are not yet in groups are encouraged to join or form women dairy groups. Similarly to this, to realize the optimal performance of these groups, several efforts are needed, such as: active participation of group activities among members, more financial and technical support from donor and government agencies
- (c) Other household members such as husbands and male children should participate fully in management of dairy enterprise. This will not only decrease the burden to women, but also increase the level of production and ultimately increased household income.
- (d) Apart from involvement in group membership and improving gender relations in dairy farming, further researches should be conducted to determine other factors which would improve more dairy production among women in Arumeru district.

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APPENDICES

Appendix I: Questionnaire for women in groups and those not in groups

GENERAL INFORMATION

1. Date of interview
2. Name of enumerator.....
3. Name of respondent.....
4. Name of ward.....
5. Name of Village.....

PART ONE

BACKGROUND INFORMATION

6. What is your age (yrs)?

- | | |
|-------------|-------|
| a) 18- 25 | () |
| b) 26-33 | () |
| c) 34- 41 | () |
| d) 42-49 | () |
| e) Above 49 | () |

7. Marital status of respondent

- | | |
|--------------|-------|
| a) Married | () |
| b) Single | () |
| c) Divorced | () |
| d) Separated | () |
| e) Widowed | () |

8. What is your education level?

- | | |
|------------------------|-------|
| a) No formal schooling | () |
| b) Primary school | () |
| c) Secondary school | () |
| d) Post secondary | () |

9. What was the major source of your household income in the last twelve months?

- a) From employment ()
- b) Non farm activities ()
- c) Dairy Farming ()
- d) Crop farming ()

10. What was your estimated income per last twelve months from activities above.....

- a) Less than 100,000/= ()
- b) 100,000 - 300,000/= ()
- c) Above 300,000/= ()

11. Give information about your household members.

1	
2	
3	
3	
4	

PART TWO.

Information about Dairy Production

12. How many cattle do you have?
13. How many dairy cattle do you have?
14. What type of breed do you have?
15. What is their average milk yield per day?
16. How many litters are sold?
17. What is the price per litter?
18. How many litters are consumed domestically?
19. What are the use(s) of surplus milk?
- (a).....
- (b).....
- (c).....

20. Indicate income from the different dairy activities.

Activity	Amount/month (Est.)
Milk sales	
Milk products	
Manure	
Others(specify)	

21. Do you have good market for milk?

(a) Yes (b) No

22 If the answer is YES, how do you sell your milk?

- a) As raw milk
- b) Processed products
- c) Selling to a processing group
- d) Selling to a processing plant

23 Do you have any marketing problem?

a) YES () b) NO ()

24. If YES, what are the problems.....

.....

25. Do you seek advice for dairy farming?

- a). From whom do you seek advise?.....
- b) How frequent?
- c) On what?

26. Do you use any veterinary services?

- a) YES ()
- b) NO ()

27 If yes how much did it costs last year?

28 If No how do you take care animals' health?

29. Did you get basic training before starting dairy farming?

a) YES ()

b) NO ()

30. If YES who provided the training.....

For how long

What was the training about.....

31. If No where did you acquire the skills of managing dairy farming.....

32. Where do you get feed for your dairy cattle?

(a) From my own farm (b) from other sources (specify) (c) both my farm and other sources

33. If the source is from your own farm, fill the following:

(a) Size of the farm (in hector)

(b) Land dedicated to pasture (in hector)

34. Apart from milk production what other economic activities are you engaged

Type of activity	Expected income per year

GO TO QUESTION 42, for women not in groups.

PART THREE

THE ROLE OF WOMEN FARMERS GROUPS

35. Do you belong to a women's dairy farmer group

a) YES () b) NO ()

36. When did you form the group?

37. Is your group registered?

a) YES ()

b) NO ()

38. What is your registration number?.....

39. What is your group size?

- a) 5- 10 ()
- b) 10-20 ()
- c) 20 and above ()

40. Where did the idea of forming a group came from?

- (a) Our Own initiative ()
- (b) NGO's or Projects ()
- (c) See from other women ()

38. What are the objectives of being in the groups?

- a) Access to training and workshops ()
- b) Access to loan and grants ()
- c) Access to market
- d) All the above ()
- e) Others specify.....

39. What are the requirements for a woman to join the group?

- a).....
- b).....
- c).....

40. What are the day to day problems that your group may encounter?

- a).....
- b).....
- c).....

41. Which benefits do you get by being in the group?

- a).
- b).....
- c).....

GO TO QUESTION 53.

PART FOUR**INFORMATION ABOUT WOMEN NOT IN GROUPS**

42. Are you aware of the existence of women's farmers groups?

- a) Yes ()
- b) No ()

43. If Yes, why are you not a member of any group?

.....

44. Would you like to join the farmers group?

- a) Yes ()
- b) No ()

45. Do you think you can get any benefit by joining farmers groups?

- a) Yes ()
- b) No ()

46. If Yes, which benefits?

- a)
- b)
- c)

47. If no, why not?

48. What is your opinion on women farmers group?

- a)
- b)
- c)

49. How are the women's organization /groups perceived by other non-women groups members in your community?

50. Have received any training on how to manage dairy farming?

a) Yes () b) No ()

51. If the answer is YES

- a) Where?
 b) For how long?
 c) What was the training about?.....

52. If no, how did you acquire the skills of managing dairy farming activities?

.....

PART FIVE

GENDER RELATIONS

53. Indicate the person performing the following dairy farming activities.

Activity		Men	Women	Male child	Female child	Relative	Hired labor
Milking	Morning						
	Evening						
Cleaning the barn							
Cutting grasses							
Feeding							
Water giving							
Treatment/Vacant.							
Fetching feeds							

54. Indicate access and control profile in dairy farming

Resource	husband		wife		Children	
					Male	Female
Animal ownership	Access	Control	Access	Control		
Who controls the income from dairy farming						
Decision on DF issues						
Education - Information						
Extension Services						

PART SIX

HOUSEHOLD INCOME AND CONSUMPTION EXPENDITURE.

55. On what items do you normally spend income from dairy production?

- a) Buying family clothes%
- b) Buying family food %
- c) House Construction %
- d) Paying for children's education%
- e) Starting new enterprises%
- f) Others (specify).....,,

56. Has your household income and expenditure increased/decreased after engaging in dairy production.

Income		Expenditure	
Increased ()		Increased ()	
Decreased ()		Decreased ()	

57. Has dairy farming helped you to raise your level of wellbeing?

58. If YES how.....

59. If NO how.....

THANK YOU FOR YOUR COOPERATION!!!

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Appendix II: Checklist for key informants

- 1 How does dairy production contribute to household income?
- 2 How other family members are involved in dairy production activities?
- 3 Why some women have decided to be in dairy farmers groups?
- 4 Why other women dairy farmers are not in group?
- 5 How are dairy cattle important to them?
- 6 What other economic activities are performed by women in Arumeru District?

- 7 Where is the idea of forming groups come from?
- 8 Do women have the right of utilizing money obtained from sales of milk?
- 9 Do families of women in group have a progressed life standard than those who are not?
- 10 Is there any dairy women farmer group which has collapsed, why?
11. What factors influencing contribution of dairy farming to household income?
12. How are the extension services provided to farmers?
13. How training on dairy farming is provided to farmers?
14. Are there any limiting factors to dairy farming?

THANK YOU FOR YOUR COOPERATION!!!!