

**RURAL HOUSEHOLDS LIVELIHOOD STRATEGIES IN COMMUNITIES AROUND  
THE FORT HARE AND MIDDLE DRIFT RURAL DAIRY PROJECTS IN EASTERN  
CAPE PROVINCE SOUTH AFRICA**



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*Together in Excellence*

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## **DECLARATION**

I declare that the following dissertation “Rural households livelihood strategies in communities around the Fort Hare and Middle Drift rural dairy projects in Eastern Cape province South Africa ” is my own work, that it has not been submitted before for any degree or examination in any other university, and that all sources I have used or quoted have been indicated and acknowledged by complete references.

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I dedicate this thesis to my wife Hilda Pfumo.

## **Abstract**

*In this study, rural households livelihood strategies in communities around Fort Hare and Middle Drift dairy projects in the Nkonkobe Municipality are explored from a household perspective. Rural communities around Fort Hare and Middle Drift dairy projects in Eastern Cape, South Africa are found choosing a multiple of livelihood portfolios that are linked to dairy project activities to increase food, generate income, and safeguard against risks and shocks. The dairy projects in rural areas can reduced the problem of shrinking livelihood options in rural areas were most of the households are relying on government grants which has characterised the rural areas with long queues during month ends. The main objectives of this study are, to assess whether the rural dairy projects set goals are being achieved; to identify dominant livelihood strategies of households living around dairy projects in Eastern Cape Province, South Africa and to identify determinant factors influencing rural households around dairy projects to choose certain livelihood strategies that improve their welfare. The study analysed socio-economic survey data that had been collected from households in six rural villages in Nkonkobe Municipality surrounding the Fort Hare and Middle drift dairy projects. The stratified and random sampling method was used. The descriptive analysis comparing the livelihood portfolios' in the six rural villages around Fort hare and Middle Drift dairy projects has revealed that there is an increasingly important role of the non-farm economy in the area (income from activities not linked to farming) as compared to farming, non-labour (income from remittances and government grants) and non-farm activities that are combined with farming (non-farm and farming activities). The multinomial logistic regression model revealed, with respect to the household variables, social-economic and institutional related variables as some of the barriers faced by poor households in rural areas sharing boundaries with rural dairy projects to enter into various livelihood strategies. Results from this study outlined that rural communities around dairy projects do not rely much on one livelihood pathway but they link multiple strategies together to improve their standard of living. The study, therefore, conclude that rural dairy projects with activities that are complementing with rural livelihood pathways available can be trusted as a reliable and sustainable livelihood source to reduce poverty in communities which share boundaries with rural dairy projects.*

## Table of Contents

DECLARATION.....	i
ACKNOWLEDGEMENTS .....	ii
Abstract.....	iii
Table of Contents .....	iv
Table of Figures.....	vii
List of Tables .....	viii
List of Maps .....	viii
LIST OF ACRONYMS .....	ix
<b>CHAPTER 1: INTRODUCTION.....</b>	<b>1</b>
<b>1.1. Background of the study.....</b>	<b>1</b>
<b>1.1.1. Dairy production and rural African livelihoods .....</b>	<b>4</b>
<b>1.1.2. Dairy Industry in South Africa.....</b>	<b>5</b>
<b>1.1.3. Large scale dairy projects in Eastern Cape.....</b>	<b>6</b>
<b>1.1.4. Commercial dairy farming in Eastern Cape .....</b>	<b>8</b>
<b>1.1.5. Smallholder dairy farming.....</b>	<b>9</b>
<b>1.2. Background of dairy projects in the study .....</b>	<b>10</b>
<b>1.2.1. Fort Hare dairy project .....</b>	<b>10</b>
<b>1.2.2 Middle Drift community dairy project case study .....</b>	<b>10</b>
<b>1.3 Problem statement .....</b>	<b>11</b>
<b>1.4 Objectives.....</b>	<b>13</b>
<b>1.5 Research Questions.....</b>	<b>13</b>
<b>1.6 Hypotheses .....</b>	<b>14</b>
<b>1.7 Justification of the study.....</b>	<b>14</b>
<b>1.8 Outline of the study.....</b>	<b>16</b>
<b>CHAPTER 2: LITTERATURE REVIEW.....</b>	<b>17</b>
<b>2.1 Introduction.....</b>	<b>17</b>
<b>2.2 Development and Food security issues in rural areas.....</b>	<b>17</b>
<b>2.3 Planning, design and implementation of rural dairy projects .....</b>	<b>18</b>
<b>2.4 Developmental Goals of establishing dairy projects in rural areas.....</b>	<b>19</b>
<b>2.5 Overview of rural dairy projects in South Africa .....</b>	<b>20</b>
<b>2.6 Overview of South African rural areas.....</b>	<b>21</b>

2.7	Livelihood strategies around rural dairy projects .....	22
2.8	Successful case studies of some rural development projects .....	23
2.9	Reasons for households livelihood diversification.....	24
2.10	Rural households' source of income in areas around dairy projects .....	25
2.10.1	Wage income.....	27
2.10.2	Self-employment.....	28
2.10.3	Transfers (Non-labour).....	28
2.11	Rural livelihoods and the notion of rural development interventions.....	29
2.12	Dairy projects and diversification of livelihood strategies .....	31
2.13	Sustainable livelihood framework .....	32
2.14	Dairy projects as a rural poverty alleviation tool .....	33
2.15	Role of dairy projects in increasing rural productivity .....	34
2.16	Dairy projects and rural food consumption and nutrition.....	34
2.17	Contribution of the dairy industry to the GDP of South Africa.....	36
2.18	Role of institutions and organizations on dairy projects.....	37
2.19	Gender and rural livelihood strategies.....	38
2.20	Dairy and gender.....	39
2.21	Environmental issues in dairy systems.....	40
2.22	Chapter summary .....	41
<b>CHAPTER 3: DESCRIPTION OF STUDY AREA AND METHODOLOGY .....</b>		<b>42</b>
3.1	Introduction.....	42
3.2	The study area: Nkonkobe Municipality in Eastern Cape.....	42
3.3	Climatic conditions, soil types and rainfall patterns in Knonkobe Municipality.....	43
3.4	Resource management systems in the study area .....	43
3.5	Dairy farming in the Eastern Cape .....	44
3.6	Baseline information on the District and Local Municipalities in the study areas .....	44
3.7.	Nkonkobe Municipality Demographic analysis.....	45
3.7.1	Demographic indicators of Nkonkobe Municipality.....	46
3.7.2	Age and gender distribution.....	47
3.7.3	Nkonkobe Local Municipality population distribution .....	47
3.8	Poverty indicators .....	48
3.9	Education.....	48
3.10	Unemployment .....	49

3.11	Employment.....	50
3.12	Household infrastructure .....	52
3.13	Water infrastructure.....	53
3.14	Governance in Nkonkobe municipalities .....	54
3.15	Socio-economic activities in Nkonkobe .....	54
3.16	Household sources of income .....	55
3.17	Conceptual framework of the study .....	55
3.18	Research Method .....	58
3.19	Research design.....	58
3.20	Research instrument.....	58
3.21	Sampling procedure.....	59
3.22	Data collection procedure.....	60
3.23	Data analysis.....	61
3.24	Approach applied.....	62
3.25	Theoretical and conceptual framework .....	63
3.26	Empirical model for the study .....	65
3.27	Independent variables .....	66
3.28	Household age.....	68
3.29	Household gender.....	68
3.30	Household education.....	68
3.31	Household size .....	69
3.32	Access to extension .....	69
3.33	Market access .....	70
3.34	Land size .....	70
3.35	Chapter conclusion .....	70
<b>CHAPTER 4: RESULTS AND DISCUSSIONS.....</b>		<b>71</b>
4.1	Introduction.....	71
4.2	Descriptive statistics.....	71
4.3	Demographic characteristics of sampled households .....	71
4.4	Household size .....	72
4.5	Household gender.....	73
4.6	Age of the household.....	73
4.7	Education level of households .....	73

4.8	Access to extension .....	74
4.9	Access to market .....	75
4.10	Household land size .....	75
4.11	Distribution of livelihood strategies of the sampled households .....	75
4.13	Rural dairy project livelihood pathways.....	80
4.14	Ranking of livelihood strategies chosen according to adult equivalence per capita income 81	
4.15	Comparative analysis of high returning livelihood strategies.....	82
4.16	Factors influencing households' choice of livelihood strategy .....	84
4.17	Household-head age .....	87
4.18	Household size .....	87
4.19	Household-head gender .....	88
4.20	Land size .....	89
4.21	Access to extension .....	90
4.22	Market access .....	90
4.23	Access to Loans and/or credit .....	90
4.24	Education .....	91
4.25	Institutional barriers in undertake high return livelihood strategies .....	91
4.26	Chapter summary .....	93
<b>CHAPTER 5: CONCLUSION AND POLICY RECOMMENDATIONS.....</b>		<b>95</b>
5.1	Introduction.....	95
5.2	Research Conclusion.....	95
5.3	Findings and recommendations .....	96
References.....		99
APPENDIX 1.....		128

## Table of Figures

Figure 1	Liquid milk products .....	6
Figure 2	Household sources of income (Stifel, 2010; Corral & Reardon, 2001).....	27
Figure 3	Sustainable livelihood framework .....	33
Figure 4	Total population of Nkonkobe Municipality .....	46

Figure 5 Nkonkobe local municipality population distribution .....	47
Figure 6 Levels of education attainment by adult population.....	49
Figure 7 Unemployment rate from 2005-9 .....	50
Figure 8 Total employment compositions .....	51
Figure 9 Number of households by type of dwelling.....	52
Figure 10 Number of household by level of access to water .....	53
Figure 11 Conceptual framework of the study.....	57
Figure 12 Education of household head.....	74
Figure 13 Categories of livelihood strategies in the study .....	76
Figure 14 Dairy project set objectives and the outcome .....	79
Figure 15 Dairy project set objectives and outcome.....	80
Figure 16 Institutional barriers to high return livelihood strategies.....	92

**List of Tables**

Table 1 Distribution of respondents interviewed.....	60
Table 2 Model explanatory variables applied in the analysis .....	67
Table 3 Descriptive statistics table of household characteristics .....	72
Table 4 Oxford scale to measure the adult equivalent per capita income.....	82
Table 5 Comparative analysis of livelihood strategies .....	82
Table 6 Multinomial regression results of factors influencing household livelihood strategy .....	85
Table 7 Goodness-of -fit Tests of model used .....	86

**List of Maps**

Map 3.1 Nkonkobe Municipality Map.....	53
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## **LIST OF ACRONYMS**

<b>IDP</b>	<b>Integrated Development Plans</b>
<b>IRD</b>	<b>Integrated Rural Development</b>
<b>ISRDS</b>	<b>Integrated Sustainable Rural Development Strategy</b>
<b>MDG</b>	<b>Millennium Development Goals</b>
<b>MFP</b>	<b>Massive Food Programmes</b>
<b>PGDP</b>	<b>Provincial Growth and Development Plan</b>
<b>RDP</b>	<b>Reconstruction and Development Programme</b>
<b>SADT</b>	<b>South African Development Trust</b>

## **CHAPTER 1: INTRODUCTION**

### **1.1. Background of the study**

Rural households' priorities are to build secure livelihoods, by investing their time and the resources around them in whichever ways are most likely to meet their needs and desires (Kemkes, 2012). The way in which they decide what activities to invest in are complex and vary enormously between households and over time (Kemkes, 2012). Despite the variability of household's decision making, such decisions need to be understood if new initiatives to aid households are to be made as relevant as possible to rural people. In planning and carrying out activities, people use a variety of strategies, setting livelihood security and well-being as their desired outcomes. Community investments in new initiatives such as rural dairy projects are unlikely to deliver their rural development goals if the target people do not perceive how and where it complements with their livelihoods.

The sustenance of rural livelihoods is more at stake than it has ever been before due to the economic liberalization taking place in developing countries. Options for securing a livelihood are shrinking in rural areas in general, but more so in eco-fragile regions such as drought affected, desert prone, hilly and other under-developed /backward districts (Subbarama, 2004). Rapidly growing markets for livestock products in general, and dairy products in particular, (owing to rises in per capita incomes) are opening new avenues for enhancing rural incomes and reducing food insecurity. Multiple economies in rural areas including dairy projects play significant roles in sustaining the rural livelihoods (Owusu, 2001). Despite the positives, it should be noted that farmer's migration and malnutrition/ill health are widely prevalent in rural areas of the Eastern Cape. Migration causes families to disintegrate as they split up when members migrate to cities in order to improve the well-being of the family (Delgado, 1991). A positive contribution is that some of the dairy based projects in drought prone districts have made rapid strides towards ameliorating poverty by substantially contributing to the food security of households (Bigsten and Kayizzi-Mugerwa, 1992).

Farming in rural areas of the Eastern Cape consists largely of the rearing of farm animals; these constitute the single largest human use of land. These farms provide food for urban and rural consumers and are an important source of income, employment and traction in developing

countries (Herrero *et al.*, 2008a). Livestock can contribute to reducing hunger and poverty by providing food, income, transport, insurance and other services to households (Phiri, 2009). In most South African rural communities, livestock farming is a tradition and it serves the vital role of enhancing food security, thereby alleviating poverty and improving rural welfare (Coetzee *et al.*, 2005). Researchers have suggested that livestock is mainly kept in rural areas because the land is largely marginal and not suitable for cropping (Hanotte *et al.*, 2002).

Food, nutrition and health have proven more difficult to manage in developing countries than in developed countries (Randolph *et al.*, 2007). In these resource-poor countries, food is needed to provide essential nutrition to marginalised populations, to provide micronutrients such as vitamins and minerals, as well as protein and energy needs (Oelofse *et al.*, 2008). Poor populations in these countries often suffer from micronutrient deficiencies due to diets that are based almost exclusively on cereals. About 820 million people were identified as undernourished in the period 2001 to 2003, representing 17 percent of the developing world's population (Randolph *et al.*, 2007). Currently 12 percent of the developing world is undernourished (FAO, 2012). This decrease might be as a result of rural development projects such as dairy projects being implemented.

Livestock-based development projects that support more market-oriented management systems tend to produce for sale in order to cover the input costs rather than for consumption. Integrating livestock development projects with nutritional health objectives and employment goals could go a long way towards ensuring that the disposable income created by these systems is used to purchase nutritionally acceptable household food that is equitably distributed to all members of the family. Income strategies that boost the welfare and food security of households have been the main agenda in most of the rural developmental programs in poor countries. Rural livelihood strategies, bringing sufficient income, lead to food security, whilst poverty leads to food insecurity (Salazar de Buckle *et al.*, 1989).

Since the mid-nineties, small scale projects like dairy projects and irrigation schemes in the Republic of South Africa (RSA) have been prioritized by the government. This is due to the fact that the majority of South Africans in rural areas such as those in the Eastern Cape were living in extreme poverty (Potter, 2004). Amongst the nine provinces, the Eastern Cape Province is one of

the most rural with its agriculturally based economy. It is one of the poorest provinces in South Africa (PGDP, 2006). As a result, rural development has been a national priority since the democratic transition in 1994 (Carter & May 1999).

According to Crosby, De Lange et al. (2000), prioritisation of small scale schemes such as rural dairy projects was perceived to be the first step towards promoting development in these impoverished rural areas. Rural development professionals (Dale, 1998; Kamarah, 2001) also argue that improving the quality of life of rural people, paying special attention to the needs of the poorest, is the key foundation for building and strengthening local people. The literature also shows that the sustainability of community level organizations is largely dependent on the economic prosperity and well-being of local people (Chambers, 1993).

Huisman (2004) suggests that ‘the farming sector alone could not offer sustainable improvements in the production and living conditions of the growing numbers of rural dwellers’, and that Integrated Rural Development (IRD) projects therefore became a popular concept in the 1980s. The main idea behind these schemes was the improvement of the standard of living of the people through widening the rural livelihood portfolios (Rural Urban Consultants, 2001). Potter (2004) highlights further that the (IRD) boosts agricultural productivity and improves rural nutrition, rural health care, rural employment and rural education.

Mlambo and Zitsanza (2001) acknowledged the role dairy farming plays in the development of the national economy through its contribution to the overall economic growth as well as individual households’ income generation and food security. It is therefore not a coincidence that the Integrated Sustainable Rural Development Strategy (ISRDS, 2004) identified livestock farming as the agricultural enterprise that was most likely to improve the welfare of rural households, alleviate poverty, and improve livelihoods in communal farming areas of South Africa when pursued strategically as a livelihood option (Coetzee *et al.*, 2004). Since the dawn of the democratic government of South Africa in 1994, rural area-based investment in infrastructure, small-scale industries and irrigation schemes has received maximum support. This has been done to increase rural livelihood options of rural households. Integrated approaches with sufficient participation such as community development and the basic needs approach,

became the dominant focuses and gained much support (Zoomers, 2008). The result was the emergence of dairy projects in rural areas.

### **1.1.1. Dairy production and rural African livelihoods**

The rural people of Africa often engage in a multitude of livelihood strategies to increase their food and income, and to safeguard against risks and shocks (Bryceson 2002). Those who structure their livelihood around integrated rural developmental projects tend to have a wider choice of livelihood options compared to households in areas without any functional community based resource projects (Francis 2000). This was also observed in the results of this study. The study shows that the households in close proximity to dairy projects are more likely to be involved in dairy linked activities such as working at the dairy project and selling field crops to the dairy projects. Despite the fact that the trend towards multiple livelihoods is not new in Africa (Ellis 2000), the current ways in which people are involved in livelihood strategies differ from traditional African subsistence production systems that were resilient and designed to respond to, adapt to and cope with environmental changes. Carter and May (1999) found that many poor and non-poor households in African rural areas derive their livelihoods from distinct activities including livestock production activities and available community based resource management initiatives.

Livestock production schemes are an important component in local economies at both the national and farm household level, with cattle constituting the main livestock species kept by farmers (Mlambo *et al.*, 1998). Mlambo and Zitsanza (2001) acknowledged the role dairy production plays in the development of the Zimbabwean economy through its contribution to the overall agricultural economic growth, households' income generation and food security. In support of this view, a study by Scoones (2002), acknowledged the role of dairy projects as safety nets, income sources, coping strategies and pathways out of poverty for the rural poor. In rural Africa, households with livestock are better off than those who have no livestock (Niehof, 2004). Most smallholder farmers in sub-Saharan Africa pursue livestock production as a livelihood strategy because their land is largely marginal and not suitable for cropping (Hanotte

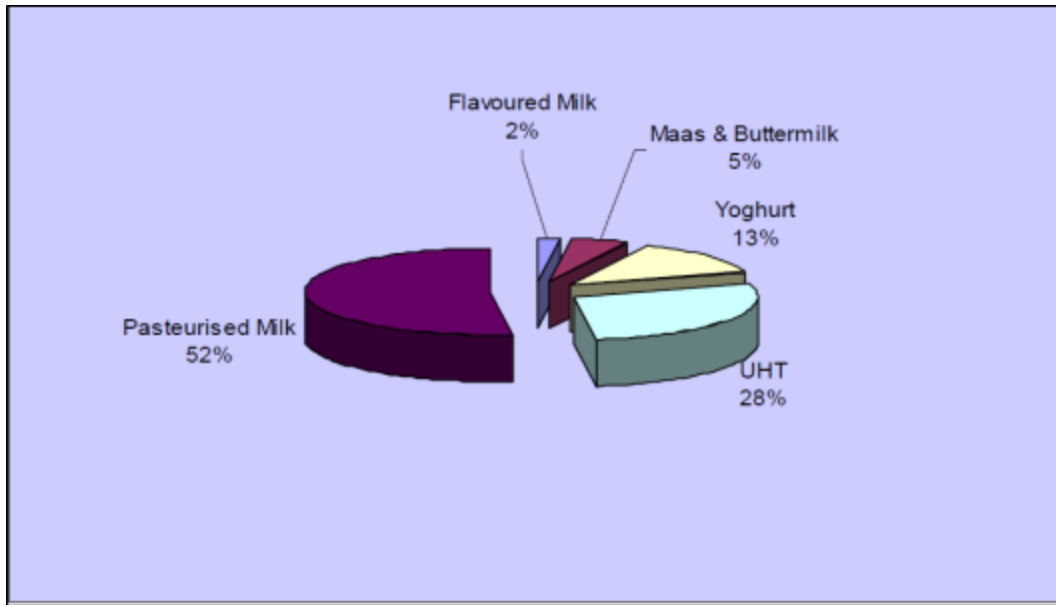
*et al.*, 2002). Delgado *et al.*, (1999) projected that milk production and consumption of dairy products are expected to grow in the sub-Saharan region by 4% annually between 1993 and 2020.

In South Africa, between the 1970s and 1980s, attention to rural development went beyond agricultural commercialization, and it became apparent that ‘the agricultural sector alone could not offer sustainable improvements in the production and living conditions of the growing numbers of rural dwellers’ (Huisman, 2004). As a result Integrated Rural Development (IRD) became a popular concept in the 1980s, resulting in the establishment of rural dairy projects. The Integrated Rural Development program had been mandated by the provincial government to facilitate the implementation of projects that aim to bring development to rural areas. It was the success of such programs that resulted in the implementation of the Fort Hare and Middle Drift dairy projects

### **1.1.2. Dairy Industry in South Africa**

Milk production in South Africa makes up approximately 0, 5% of the global milk production (South Africa Agricultural Statistics, 2010). According to the statistics from South African Agricultural Statistics (2007), there are four major dairy breeds that are used by commercial dairy farmers in South Africa. These are the Holstein, Jersey, Guernsey and Ayrshire. These dairy breeds have high commercial value in comparison to indigenous breeds. The dairy projects based at Fort Hare and Middle Drift both use the Jersey breed which has adapted well to the area. The introduction of these exotic breeds has spearheaded the quick development of these two dairy projects, with each project producing and selling 6000 litres of milk to clover daily (Fort Hare daily report, 2013).

The dairy industry in South Africa comprises of a number of different economic activities which include the production and marketing of raw milk, pasteurized milk and cream, fermented milk, long-life milk and cream, yoghurt, cheese and its by-product whey, milk powder, sweetened concentrated milk, butter and butter oil (South Africa Agricultural Statistics, 2010).



**Figure 1 Liquid milk products**

*Adapted from: MPO (2010)*

Figure 1 above shows the liquid milk products processed by the dairy industry in South Africa. Pasteurised milk makes up the greatest percentage at fifty two percent while flavoured milk has the lowest percentage at two percent.

### **1.1.3. Large scale dairy projects in Eastern Cape**

The Eastern Cape Province is one of the poorest provinces in South Africa (PGDP, 2006). The majority of the poor live in rural areas and depend on their natural resources to survive. They also rely on government grants, pensions and remittances from the working members of households (Perret, 2000). Climatic conditions such as low rainfall and dry spells in the marginal areas of Eastern Cape have made conditions unfavourable for crop farming. This has resulted in the failure of government efforts to revitalise crop farming through, 'massive food programmes' as a food security measure. As a result, most district and local municipalities in Eastern Cape have prioritised agricultural rural livestock farming projects in their Integrated Development Plans. This explains the emergence of large dairy projects in the area (Nkonkobe Local Municipality IDP, 2006/7).

These Large scale dairy projects in Eastern Cape are operating at commercial levels. They produce milk mainly for sale, including export. This has raised great concern among local households who view the projects as exporting the products of their natural resources to other economies. This study will explore the various livelihood strategies made available by the large scale dairy farmers to the households living around dairy projects in rural areas, in return for the natural resources they used.

Dale (1995) noted that rural industrialization can transform subsistence economies into market economies. Dairy products that are produced by dairy projects using rural resources are supplied to internationally recognised markets and profits are brought back to the rural projects in order to improve the job market in rural areas. The large scale dairy projects like the Fort Hare dairy and Middle Drift dairy projects are ploughing back into local households through widening of the livelihood portfolios. For example, some respondents interviewed in this research, reported that they had received mentorship in dairy production while others reported getting job opportunities at the dairy project.

According to South Africa Agricultural Statistics (2010-11), the milk production in South Africa makes a very small contribution to the overall global milk production, but in the context of domestic agricultural production, dairy production is the fifth largest agricultural contributor to country's Gross Domestic Product. Milk production in South Africa, mainly produced by large scale dairy projects makes up approximately 0, 5% of global milk production (South Africa Agricultural Statistics, 2010). In South Africa, the dairy industry is of paramount importance to the economy as it contributes significantly to the job market. There are over 4 000 milk producers employing 60 000 workers and providing 40 000 people with indirect jobs such as jobs in milk processing and the milking industry (Dairy MVCP, 2010-11).

One of the main objectives of the Dairy Projects established in rural areas like Fort Hare dairy project in Nkonkobe municipality is to improve sustainable economic development through the improvement of the income and nutrition of rural farmers with dairy farming (Fort Hare dairy, 2008). In some areas, large scale dairy farms are viewed as multi-product firms producing milk, meat from culled cows as well as crops (Deller, 2007). This study however, treated large dairy

farms as single functional entities operating in natural resource rich rural areas, and supplying outside markets with milk.

#### **1.1.4. Commercial dairy farming in Eastern Cape**

Milk production in South Africa is done mainly by two sectors; Commercial producers and small to medium sized producers. Commercial milk production is found mainly in the higher rainfall areas in the northern and central parts of the province (de Wet and van Averbeke, 1995).

During the 1990s there was a shift in some areas from pure domestic livestock production to either game farming or a mixture of the two enterprises (deLange *et al.*, 1994). In the Eastern Cape, the commercial dairy livestock farming system differs markedly from the traditional African production system. The key elements of the commercial dairy system are the employment of rangeland management and the use of feed supplements (mineral licks, animal feeds and fodder production) during periods such as winter months and dry seasons when fodder supplied by the natural range is deficient. Commercial dairy livestock producers look to prevent losses in condition and weight of their animals by supplying fodder and nutrient supplements.

In many cases, arable land is used to produce fodder crops like soybean and maize. Some farmers improve their rangeland by planting fodder species into the natural vegetation. An example of this would be the planting of Atriplex in the Karoo region (van Averbeke and de Lange, 1995). The farmers interviewed in rural areas around the Fort Hare and Middledrift dairy projects produced maize and marketed it to the dairy projects. They used the income received from the sale of their produce to boost their welfare.

A second major difference between commercial and communal livestock production is the degree of control over breeding. In the commercial system, livestock management is directed at improving the herd or flock by means of selection and culling, as well as the regular entry of superior genes (purchase of male animals or artificial insemination). Herd and flock improvement in commercial livestock production is usually focused on improving the animal's ability to produce the desired product, normally milk. In communal areas this type of control over breeding is very difficult because animals from different owners use the same range. Female animals mate with whichever male is available at the time, even if the male happens to

have undesirable traits (van Auerbeke and de Lange, 1995). It could also be argued, however, that the communal system encourages a degree of natural selection to occur. This is because in such a system, it is mainly the most hardy and disease-resistant animals that survive, allowing for a continually improving gene pool to be maintained.

#### **1.1.5. Smallholder dairy farming**

The term 'smallholder' differs between countries and varies from one geographical location to another. The majority of the sub-Saharan population living in rural areas can be considered smallholders, mainly because of their limited resource endowments, relative to other farmers in the same sector (Dixon *et al.*, 2004). The size of land holdings also varies between countries and farming systems, and is normally less than one hectare in areas with high population densities (FAO, 1997).

Even though small farm sizes and poor resources endowments have often been regarded as the hallmarks of a smallholder, differences also exist between small holder and large scale farmers with regard to household expenditure patterns, use of external labour, resource allocation, cash crop production, livestock ownership, off-farm activities and proportion of produce sold (Dixon *et al.*, 2004; FAO, 1997).

In the South African context, smallholders are commonly classified as subsistence or emerging farmers (van Auerbeke & Mohamed, 2006). As a proportion of total farmers in South Africa, subsistence farmers are the majority and commercial farmers a minority. Emerging farmers, those with a desire to produce on a commercial scale, fall somewhere in between (Nieuwoudt, 2000).

Small-scale milk producers face many hidden barriers, making it difficult for them to benefit from market opportunities. Amongst these are lack of access to markets and productive assets, high marketing costs for liquid milk, thinness of markets for liquid milk and the risk associated with marketing of perishables (Holloway *et al.*, 2000).

## **1.2. Background of dairy projects in the study**

### **1.2.1. Fort Hare dairy project**

The town of Alice is best known as the primary location of the University of Fort Hare. Fort Hare dairy project is an innovative scheme run from a farm outside the town of Alice. In the project, a group of successful commercial farmers mentor black farm workers to become successful farm managers and owners (Fort Hare Dairy Manual, 2008). The rationale behind the programme is that, for land reform to be successful, black people have to be equipped with the necessary skills to manage farms. As part of the scheme development, a company called Amadlelo Agriculture (representing 70 white farmers) partnered with 600 workers from 70 farms and an empowerment group called Vuwa Investments created Fort Hare Dairy Trust (Fort Hare Dairy Manual, 2008). Amadlelo established a partnership with Fort Hare University, with a number of aims. These include establishing successful dairy farms on redistributed land, using grazing land only for feeding cattle (in some cases this entailed programmes to improve the soil and grazing potential of farms), establishing skills transfer programmes so that local community members could eventually begin running the farms themselves, training locals to be able to manage farms in other areas and providing employment for community members on the farms (Fort Hare dairy manual, 2008). Work began in 2007, and today, the farm produces 10 000 litres of milk per day, most of which is bought by Clover (South Africa Agricultural Statistics, 2010).

The Fort Hare Dairy Trust provides dividends for its 600 farm workers and acts as a training centre for young agricultural graduates. Trainees are rewarded with cattle for good performance. In this way, they can start to build up their own herd of dairy-producing cattle. The Fort Hare dairy project contributes to the transformation of agribusiness in South Africa through the training and mentoring of black farmers. This is done by entering into long term partnerships, transforming latent community assets into profitable business fortification, poverty relief, job creation and food security (South Africa Agricultural Statistics, 2010).

### **1.2.2 Middle Drift community dairy project case study**

Middle Drift dairy trust is a large multifunctional, self-sustaining dairy unit situated in the Middle Drift area of the Eastern Cape Province of South Africa. It came into existence in late

2004 and was established by 70 commercial farmers in the Eastern Cape. It falls within the jurisdiction of Middle Drift in the Nkonkobe Municipality. The area around the Middle Drift dairy project is also predominantly a stock farming area as the land is semi-arid. This also means that the farming is essentially subsistence (Nkonkobe IDP Review, 2009/10).

Improving the productivity of dairy animals in the rural dairy projects enables the long term sustainability of the projects and also enables them to meet their set objectives. In order to improve productivity, the Middle Drift dairy project is engaged in creating artificial pasture and fodder crop production to meet the feeding requirements of the cows (Middle Drift dairy trust manual, 2007/8). As suggested by Mdoe and Kurwijila (1998), breeding and disease control are essential for the improvement of milk productivity. The Middle-drift community dairy project has a specialized breeding program that only breeds Jersey dairy cows.

Rural dairy projects, like the Middle Drift community dairy project, play a vital role in improving the livelihood of rural households through their service delivery. Democratic South Africa has continued to prioritize agriculturally linked projects in the Eastern Cape despite the lack of convincing evidence that such projects in rural economy have the strength to drive economic reform in rural areas (Ntsebeza, 2007).

### **1.3 Problem statement**

Community operating dairy projects have been established on the assumption that possible dairy project activities would act as a livelihood source for surrounding communities who would be capable of accepting and promoting the operation of dairy projects in their area. In practice however, dairy projects seem to have failed to generate sufficient revenue to address livelihood requirements for the ever-growing rural communities (Kadzere, 1992). There is enough evidence observed from Eastern Cape rural households that they are mainly relying on external economic activities, especially state grants, to survive (Monde, 2003). There is evidence that many households are being marginalised and that their daily lives are characterised by poverty, food insecurity, unemployment, inequality, lack of important socio-economic services. This has caused most researchers to question the practical potential of community development projects like dairy projects for addressing the livelihood needs of their surrounding communities (Hasler, 1999).

The rural dairy projects are full functional large investments using rural natural resources like land and water with the main goal of achieving food security and poverty reduction to rural population through the livelihood options they offer (Bembridge, 2000). In spite of all these rural initiatives and interventions made to stimulate rural development, very little significant change to the lives of surrounding households has been realised as many people still remain in the “ultra-poor” class (Monde, *et al.*, 2005).

Researchers (Dasgupta, 1998; Thirtle *et al.*, 2001), show that rural agricultural projects like dairy projects and rural irrigation schemes contribute to rural households' ability to meet their basic needs. Despite this, a reality that still requires explanation is ‘the increasing percentage of rural households who are still living in poverty’ (Monde *et al.*, 2005). Members of these households still queue for government grants every month despite the presence of fully functional dairy projects in Eastern Cape. This may be interpreted as a clear warning sign that community operating projects are failing to act as an adequate livelihood source. Therefore, the need arises to evaluate the potential of rural dairy projects as community livelihood sources.

Although society assumes intuitively that dairy projects are important, their value may be overstated if it is seen more indirectly than directly in the surrounding communities who are expected to be its custodians. Also, although it may seem obvious that dairy projects are multifunctional, this benefit is not convincing in the light of suffering local communities who watch the dairy projects using their natural resources in their area on a daily basis without themselves experiencing significant benefit. The economic situation of the average person living in the former Ciskei and Transkei has not improved since independency of democracy; in fact, it has gotten worse (Bank and Minkley, 2005; Ntsebeza, 2007). Obi (2011) outlines that the South Africa’s post-apartheid economy continues to invest in agricultural development but poverty remains endemic among households with agriculture as their main source of livelihood.

The problems that affect the rural setup are either that the established rural development projects have objectives that do not complement the rural livelihood strategies pursued (PGDP, 2006) or the rural households do not have the experience needed to diversify their livelihood strategies

(Taylor, 2000). Provided with the diverse livelihood portfolios set by the community based resource management programmes like dairy projects, irrigation projects and agricultural poultry projects, the rural communities in Fort Hare and Middle Drift areas should have become economically self-sustaining in the period since independence (PGDP, 2006). This study seeks to assess whether the Fort Hare and Middle Drift dairy projects and their resultant rural development projects complement or conflict with the rural livelihood strategies chosen by households who live around the dairy projects. The project tries to bring answers to questions like, ‘why are poor households in the Eastern Cape rural areas stuck in a cycle of low income earning, despite the presence of dairy projects whose stated aim is to improve their livelihood portfolios?’ The question is answered by analysing factors that affect how households choose their specific livelihood portfolio. The results make mention of household variables, social-economic variables and institutional related variables, all of which hinder rural households from making use of high-return livelihood options.

#### **1.4 Objectives**

The main objective of this study is the identification of the livelihood strategies of communities around Fort Hare and Middle Drift rural dairy project in Eastern Cape Province of South Africa.

##### **Specific Objectives**

- To assess and evaluate whether the set goals of Fort Hare and Middle Drift rural dairy projects are being achieved.
- To identify dominant livelihood strategies of households living in the Fort Hare and Middle-drift rural dairy projects.
- To identify determinant factors influencing livelihood strategies of rural households in the Fort Hare and Middle-drift dairy projects.

#### **1.5 Research Questions**

- Are the set goals of dairy projects in rural areas being achieved?

- What are the dominant livelihood strategies of households living in Fort Hare and Middle-drift dairy projects?
- What factors influence the livelihood strategies of rural households in the Fort Hare and Middle Drift dairy projects?

## **1.6 Hypotheses**

- H<sub>0</sub>: Dairy projects have rural livelihood development goals of providing employment opportunities to the surrounding communities.
- H<sub>0</sub>: Only-farm, non-farm and non-labour activities and combinations of these are key livelihood strategies of households in Fort Hare and Middle Drift dairy projects.
- H<sub>0</sub>: Household characteristics and socio-economic variables influence households to choose various livelihood strategies.

## **1.7 Justification of the study**

The research is of paramount importance as it examines how rural households in the Fort Hare and Middle Drift dairy projects secure their livelihoods. It helps to understand how rural dairy schemes can “fit in” to rural livelihood strategies available in the rural economy. The research helps to understand rural dairy projects from the perspective of households, and recommends ways in which dairy project can be implemented in ways that they have maximal positive impact on rural household's welfare.

The study of the dynamics and complexity of the livelihood strategies chosen by rural households living around agricultural linked rural projects in developing countries such as South Africa is also important for several reasons apart from its the expected impact on income and poverty reduction. When considering missing or imperfect markets for credit, insurance, or land, diversification choices are supposed to reflect optimal strategies followed by farm households in order to balance their expected returns with the related risk exposure they face. Since not all livelihood strategies chosen are equally lucrative, understanding both the incentives and the constraints that rural households face in their decision making between alternatives can offer

important insights as to what policy might effectively improve the rural poor access to higher-return activities.

This is important both from a positive and normative viewpoint. Households belonging to different socio-economic groups have different strategies by which they earn their living. This may afford them different levels of resilience to food insecurity. As a result, households belonging to different socio-economic groups require different interventions. This study helps policymakers to tailor their livelihood development strategies to meet for differing needs of the population. Comprehending the driving factors of each livelihood strategy is therefore crucial to improving the response mechanisms to food insecurity and poverty in developing countries.

The research outlines major sources of income in rural communities where dairy projects are situated and also identifies dominant livelihood strategies pursued by households; matching them with activities of the dairy project. This study is of great importance because it clearly gives the guidelines and answers to questions like, 'what determines which activities households pursue?' and 'to what extent, and in what combination are these activities pursued?' 'Comparing the different strategies pursued by rural households living around the dairy projects will help provide information on whether households are able to combine their livelihood strategies and the rural dairy project activities.

Furthermore the analysis of livelihood strategies in conjunction with important socio-economic characteristics of rural households, will give some insight into the barriers that limit poor households' from employing high-income return livelihood strategies as well as helping households to address those barriers. This study will also identify households livelihood strategies that contribute much in reducing poverty and which policy makers and development practitioners could target as means of making a meaningful difference in the lives of poor households in rural areas. In the light of these overview strategies, the significance of rural dairy projects to rural households is assessed.

## **1.8 Outline of the study**

The entire study is presented in five chapters. Chapter two provides literature review and gives definitions of concepts. Chapter three outlines the methodology adopted in the study, including the delineation and a detailed profile of the study area where the research was conducted (Nkonkobe local municipality, Eastern Cape Province), the nature and sources of data, analytical tools and techniques used to analyse the data. The empirical results of the study and discussion of results are presented in Chapter four. The summary and policy implications are given in Chapter five.

## **CHAPTER 2: LITTERATURE REVIEW**

### **2.1 Introduction**

This chapter provides a broad perspective of large scale government and private sector initiated rural projects operating in the rural areas of Nkonkobe municipality. It highlights their main objectives and their economic contribution. It also cites case studies from other developing countries where dairy projects and other rural development projects have been a success. A review of rural livelihood strategies available to households situated around dairy projects is also provided. The study expatiates on the household characteristics and socio-economic factors influencing rural households away from choosing superior livelihood strategies with the potential of improving rural welfare.

### **2.2 Development and Food security issues in rural areas.**

In South Africa, food insecurity is not from a failure of the agricultural sector to produce sufficient food at the national level, but rather a failure of households to access guaranteed sufficient food (FAO report, 2008). Food insecurity and malnutrition are highest in provinces with large rural populations such as KwaZulu-Natal, Limpopo, the Eastern Cape and the Free State (Department of Agriculture, 2010). Agricultural growth and development, however, offers possibilities for reducing the risks of food shortages at all levels. It also provides the opportunity to increase the overall supply of food, to create economic opportunities for vulnerable people and to improve dietary diversity and the quality of food consumed by farm households (Lyne *et al.*, 2009). Implementation of dairy projects in these rural poverty stricken areas was an initiative of the Rural Development Program (RDP) which viewed rural dairy projects as a pathway to rural development if they complemented the livelihood options chosen by households in the vicinity of the dairy projects (Hart *et al.*, 2009). The dairy projects offer employment which enables households to have income that they can use to access food and become food insecurity. Van den Berg (2009) observed that communities surrounding dairy projects were better off than rural households in areas without any community development projects such as dairy and irrigation projects.

The Rural Development Plan (RDP) was basically a blueprint that outlined the new democratic government's strategy for attempting to decrease the prevalence of poverty in the country. Implicit in the RDP was the acknowledgement that the most severe poverty is normally found in rural areas. However, despite the strategies contained in the RDP, a key challenge for the post-apartheid government was how to go about making poverty eradication strategies contained in the RDP a reality in the poorest rural areas where there are a minimal number of job opportunities, poor infrastructure and poor levels of education. There are sufficient opportunities for dairy projects to enter rural areas and realize their goals of providing job opportunities and improving rural infrastructure FAO (2001).

### **2.3 Planning, design and implementation of rural dairy projects**

A rural development strategy, the Integrated Sustainable Rural Development Strategy (ISRDS) was implemented in 2001. It was later changed to a programme and was renamed the Integrated Sustainable Rural Development Programme (ISRDP). This was done to emphasise its operational purpose (Perret *et al.*, 2005). In general, the strategy (programme) emphasised government's commitment to address development challenges in rural areas. In the establishment of Integrated Rural Development projects like Fort Hare and Middle Drift rural dairy projects, the rural households around these projects were at the centre of the planning and implementation process, as Denison and Manona, (2007) explained. This demands substantial two-way information transfer between the households and the project so that the implications of decisions made can be fully appreciated by intended end users. Despite a lack of consensus on which land-based economic development strategies work best in conjunction with household chosen livelihood strategies chosen to eradicate poverty, agriculture related projects were generally accepted as a crucial element (Lahiff, 2002). Thorough planning, design, viable implementation plans, monitoring and evaluation enable viability of the implemented dairy projects as long as their activities complement the rural livelihood strategies. Well implemented dairy projects with objectives that are made known to the households around are more likely to be effective at delivering their services because this makes it more likely that the households will be willing to link the dairy activities with other means of livelihood.

FAO (2001) commenting on dairy developments, highlights that failure of implemented dairy projects in developing countries happens if dairy development projects continue without the involvement and participation of the users in the process. It is only through their involvement from the beginning of a project that households can develop a sense of ownership and will be more likely to care for the system and link it with other livelihood strategies practiced. The sense of ownership felt by households and a good compliment between the project and other livelihood strategies that households employed prevent several of the problems that often arise. In addition, gender-power imbalances in the project must be constructively addressed so as to avoid the exclusion of large numbers of key players (especially women) from the process. Exclusion of women often results in the subsequent failure of the interventions. Further support for this idea is provided by Denison & Manona (2007), who state that women are responsible for some 65% of farming activity in the smallholder sector, yet most of the decisions in meetings are still made by men. This might be one of the causes of failure in the implementation of rural developmental interventions since the desire to pursue particular interventions as livelihood strategies would not be there if key players are excluded.

#### **2.4 Developmental Goals of establishing dairy projects in rural areas**

In most developing countries, the main objective of planning and development policies is growth with equity. Development is a complex process; it is the end product of a wide variety of interrelated social, economic, political and cultural factors and processes. Todaro (1993) sees the concept “development” as a multi-dimensional process involving the reorganisation and reorientation of the entire social and economic systems. He points out that it typically involves radical changes in institutional, social and administrative structures as well as in popular attitudes, and customs and beliefs, to bring about the desired changes. With the concept of rural developmental goals, dairy projects are likely to reorganise and reorient the socio-economic position of the surrounding communities.

Growth with equity has become a major objective of development and planning in most developing countries. The dairy projects’ basic aim of infrastructural development involves promoting growth and infrastructure in areas where the projects are located. These areas

generally have higher incidences of poverty and therefore any gains in productivity as a consequence of the increased investment in infrastructure are going to benefit the poor also. The dairy project's infrastructure helps the rural poor by increasing their accessibility to schools and health centres and enables them to obtain non-farm employment in far-away places (Chadha, 1994). Barau *et al* (1999) emphasises the role of rural development projects as a means of increasing food and raw material production as well as promoting rural livelihood strategies.

The primary goal of establishing rural development schemes such as dairy projects, is to improve rural livelihoods through sustainable crop and animal production for the purposes of food security and poverty alleviation (FAO, 2001). Poverty alleviation is a binding policy goal internationally, as stipulated in the Millennium Development Goals (2002), and is the guiding principle of multinational agencies such as the World Bank. Within South Africa, poverty alleviation was elevated to a national policy goal following the democratic transition of 1994. Poverty is ordinarily greatest in rural areas (Carter and May, 1999). Dairy development is an important economic activity in these rural areas, and is therefore either posited as a potential key player in rural poverty alleviation, or at the very least, rural poverty mitigation (FAO, 2001). If all goals are met in the long run, the rural welfare of households around dairy project are more likely to be better off than the households in areas without any projects that make use of natural resources.

## **2.5 Overview of rural dairy projects in South Africa**

Since the mid-nineties, small scale projects like dairy projects and irrigation schemes in the Republic of South Africa (RSA) have been prioritized by the government. These were promoted due to the fact that the majority of South Africans were living in poverty stricken rural areas such as those of the Eastern Cape Province (PGDP, 2006), and are surrounded by important natural resource like land and water which could be sustainably used to improve rural welfare.

Active participation in dairy agriculture could reduce the level of migration to the cities by young rural people, who might otherwise migrate to urban areas in search of jobs not available in

rural areas. Lipton *et al* (1996) found that rural dairy projects have helped employ rural people and generate income in many other developing countries.

Development agents like Fort Hare and Middle Drift dairy projects are assigned the role of promoting modern agriculturally related practices while providing close technical guidance as well as influencing the farmer's outlook towards using location specific modern agricultural inputs by the provincial development authorities. This role is played by agents throughout the nation in general. Livestock in general and dairy animals in particular, play a vital role in the South African economy through provision of employment. Lack of income due to unemployment contributes to food insecurity and leads to social exclusion problems. The development of rural dairy projects creates employment which enables rural households around to have access to income which they will use to acquire food and become food secure.

## **2.6 Overview of South African rural areas**

South Africa is divided into two economies, the rich and the poor. This is reflected in South Africa's Gini coefficient of 0.593. This indicator, a measure of the level of inequality, shows that there is in-equality between rich and poor in the country (Vink and D'Haese, 2003). South Africa also has high unemployment rates in the rural population of the former homelands. These areas have a high poverty rate relative to the rest of South Africa (Vink and D'Haese, 2003). Carter and May (1999) found that poor and non-poor households derive their livelihoods from distinct activities. For example, their studies showed that wage income earners fall into the non-poor bracket than those that depend on agriculture as their main source of income. On the other hand, the work by Leibbrandt *et al.*, (2000) gives interesting insight into the contribution of various livelihood strategies to households' total income. Leibbrandt *et al.*, (2000) found that wage income was the most important income component and also the most important source of inequality in the rural areas of South Africa. The promotion of dairy projects in the rural set up is of paramount importance since they are likely to widen the pool of rural livelihood strategies that rural households can be involved in, resulting in an improvement of their standard of living.

There is a large, poorly educated rural population who are largely unskilled workers (Gardiner, 2008). This forces the majority of rural people to migrate to urban areas. Many young rural men and women left their home districts in search of employment in the mines and factories (Vink

and H'Haese, 2003). This migration trend can be reversed in the long run if more rural developmental projects like dairy projects are established to broaden the livelihood portfolio pool of employment and to improve the welfare of households that surround the projects.

Since the transition to democracy some 20 years ago, the government of South Africa has addressed a myriad of constraints in the political, economic, and social spheres, opening up opportunities for some households in rural areas to venture into newer strategies by broadening the portfolio of activities available to them in order to reduce rural-town migration.

## **2.7 Livelihood strategies around rural dairy projects**

The concept of livelihood has remained a subject of utmost importance due to its great role in human existence. A livelihood is much more than a job as it covers a whole range of activities people undertake to make a living. Rural areas are characterised by the presence of diverse economic activities. Some are farm related and others not. Research has shown that non-farm activities are growing in importance (Barrett *et al.*, 2001). According to Little *et al.* (2001), in Africa, non-farm sources account for 40-45 % of the average household's income. This supports the argument that, rural dairy projects are more likely to widen the livelihood options of communities around them.

Ellis (1998) defines livelihood diversification as 'the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living'. The presence of dairy projects in the rural areas enables the rural households living around dairy projects to adopt dairy related available livelihood strategies for survival and to link them with the existing livelihood options. Livelihood strategies are classified on the basis of farm (livestock and crop production), off-farm (wage employment on other farms), and non-farm (non-agricultural income sources such as wage employment, self-employment, property income, and remittances). The employment offered by dairy projects fits into the non-farm livelihood strategy while the dairy projects also strongly promote farming livelihood strategies since the surrounding households get a good market for their field crops from the dairy projects.

The approach proposed by Brown *et al.* (2006), termed an asset-based approach, promotes the application of statistical techniques to cluster households on the basis of livelihood strategies. It uses the resulting strategy-specific income distributions to test differences in welfare among identified livelihood strategies. Elbers & Lanjouw (2001) and Lanjouw (1995) found that rural households with the potential to diversify their income sources by including non-farm activities are relatively better off than those that depend solely on farm activities alone as their sources of livelihood. This finding has policy implications since it promotes the development of non-farm activities to address poverty in rural areas.

## **2.8 Successful case studies of some rural development projects**

Carter and May (1999) found that poor and non-poor households are distinct in the activities they derive their livelihoods from and combine to maximise household income and improve household welfare. For example, their studies showed that wage income earners are more commonly non-poor than those that depend on agriculture as their important source of income. On the other hand, the work by Leibbrandt, *et al.*, (2000) gives interesting insight into the contribution of various livelihood strategies to households' total income. It outlines that, wage earners who have the capacity to include farming activities are economically better off. These success stories are strong evidence to support the presence of dairy projects in rural areas so that households living around dairy projects can earn wages that will improve their welfare. In addition, the study reveals the role these strategies played as key sources of inter-household income and solutions to inequality and poverty in rural areas. Leibbrandt, *et al.*, (2000) found wage income was the most important income component and also the most important source of inequality in the rural areas of South Africa. These success stories give the outline that if rural dairy projects to meet their goals, rural households living around the dairy projects will have an improved livelihood. This would affect level of poverty in Knonkobe municipality and many other rural areas.

This study takes cognisance of the contributions that these past studies have made and also attempts to add to the existing body of knowledge. Since the transition to democracy some 20 years ago, the government has addressed myriad of constraints in the political, economic, and social spheres. This has opened up opportunities for some households to venture into newer strategies by broadening the portfolio of activities available to them. Past studies classified

livelihood strategies very broadly. In this study, the classification is influenced by the question the study attempts to address; this necessitates reclassifying some of the broadly classified sources of income exclusively into farm, non -farm, mixture of farm and non-farm and non-labour sources of income. As opposed to Carter and May (1999), this do not use a poverty line to calculate the dominance of one livelihood strategy over the other. Instead, comparative analysis of the per capita adult equivalent income was done. It ranked livelihood strategies, giving higher ratings to those that offered more return to households around the dairy projects.

## **2.9 Reasons for households livelihood diversification**

Households diversify their livelihoods for various reasons. The literature aggregates the reasons under different categories. For example, Ellis (1998) ascribed diversification to households' pursuit of voluntary and involuntary strategies; Von Brown (1989) says it is due to *ex ante* risk minimisation and *ex post* coping strategies; Barrett *et al.* (2001) suggests that it is due to push and pull factors. Despite differences in the semantics used by different researchers, they all suggest similar reasons for diversification. Ellis (2000) explains *ex post* coping strategies as strategies that households are forced to adopt in reaction to disasters of some sort (Ellis, 1998; Ellis, 2000). Deliberate *ex ante* income diversification strategies can be described as safety valves. They refer to push factors such as minimisation of risk, liquidity constraints, labour constraints, land constraints, high transaction costs, and seasonality. Households try to stabilise their income by diversifying into income sources that are less susceptible to climatic and price variations. Households could also embark on deliberate *ex post* income diversification strategies. These constitute activities that can be strategically allied to or are complementary to their primary source of income. Examples of this include integration of crop and livestock activities; a common form of diversification in this study. A Market for grain crops and soybeans grown by those in households around dairy projects in this study was always available. This significantly increased the land area that was being cultivated.

The literature argues in support of the economic theory that households should allocate resource endowments in a manner that equates marginal returns across activities accessible to them. Poor households are forced to stick to low-return activities because of entry barriers they face to high-return strategies. According to Brown *et al.* (2006), in the presence of both high- and low-income strategies, households adopt the latter only when there are barriers to adopting the former.

The literature has identified a number of entry barriers to reaching livelihood strategies in developing countries. These include lack of access to formal credit; lack of access to markets because of such factors as distance, and inadequate information; demographics of household heads such as education attainment, age, experience, and gender; and limitations in households' asset endowments such as land, labour, and financial capital (Stifel, 2010, Brown, 2006 and Barrett *et al.*, 2001).

## **2.10 Rural households' source of income in areas around dairy projects**

ILO, (2003) defined rural household income as all receipts whether monetary or good or services that are received by the rural household or by individual members of the household at annual or more frequent intervals. It excludes windfall gains and other such irregular and typically one time receipts. ILO (2003) further disaggregated income measures into six major categories which include wages (further divided into agricultural and non-agricultural wages), crop production, livestock production, transfers, self-employment and other income.

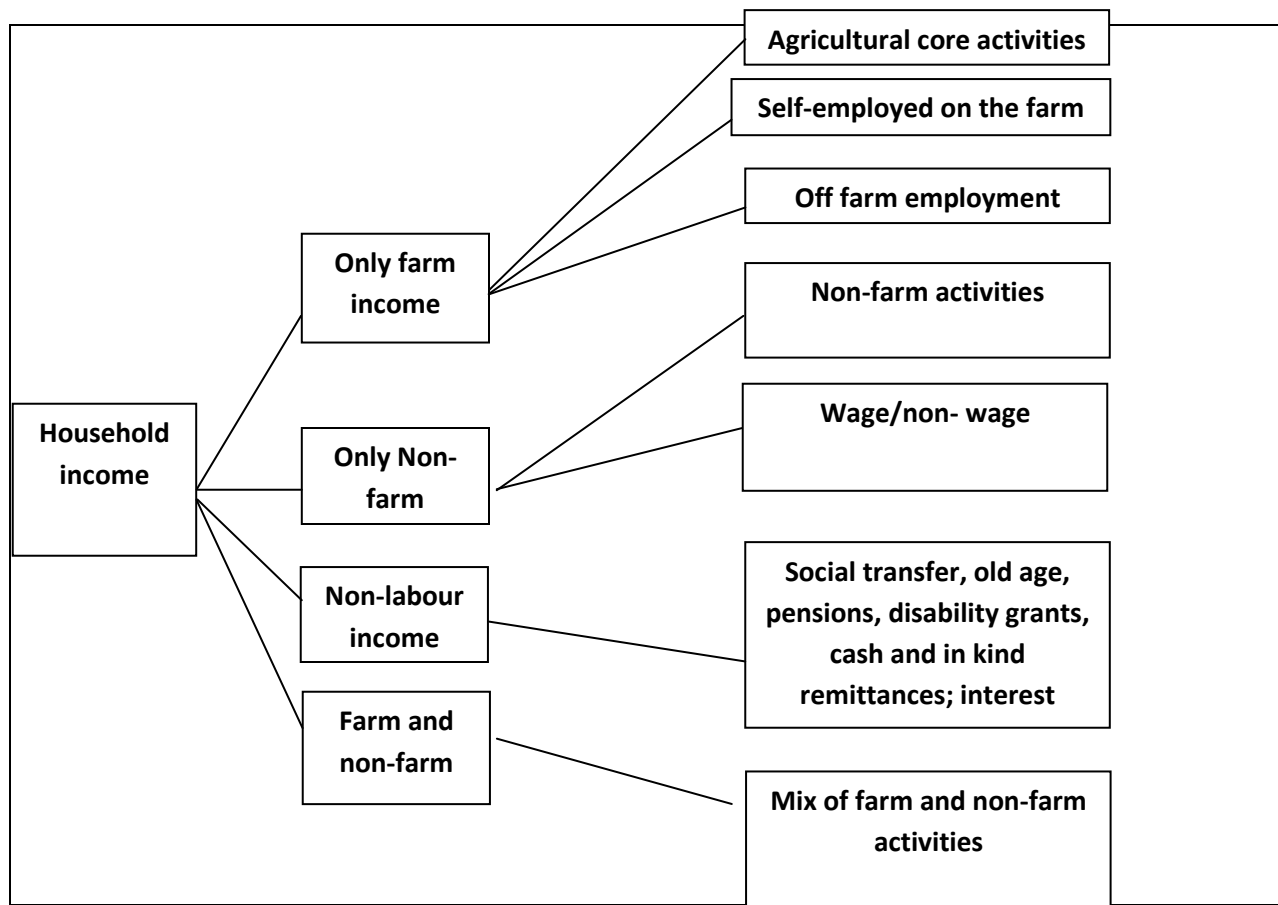
Leibbrandt *et al.*, (2010) indicated that it was important to disaggregate household income into four sources in the South African context. These include, wage income (including self-employment), remittances, capital income (such as dividends, interest, rent income, social assistance and imputed rent from residing in own dwelling) and private pensions. Farming plays a dominant role as a source of household income, and its contribution to household income exceeds the total contribution of all non-farm income sources combined (Leibbrandt *et al.*, 2010). The argument of Leibbrandt *et al.*, (2010) contradicts that of Machethe (2004) who noted that non-farm sources contribute more to household income for "poor" households than farming does (Machethe, 2004).

The research adopts a method from the literature that broadly classifies rural households in South Africa into five groups on the basis of their main sources of income. It describes 'non-labour' income, 'only farm' income, 'farm and non-farm' income, 'farm and non-labour' income and 'only non-farm' income (Stifel, 2010; Corral & Reardon, 2001). The 'non-labour' income group represents households that rely on remittances, pensions, and social welfare; the 'only farm' group comprises households that derive income only from farming (self-employed on their own farm or farm labourers that operate on commercial farms (Stifel, 2010; Corral & Reardon, 2001).

The ‘farm and non-farm’ group benefits from a mix of farm and non-farm activities while the ‘only non-farm’ group only receive income from non-farm activities.

Households that make use of the ‘farm and non-farm’ and the ‘only non-farm’ activities were further classified into smaller sub groups – wage and non-wage. Households could get employment from farm related activities or on other farms. This is illustrated in the tree diagram in Figure 2

Analyses of rural livelihoods in Africa, Asia and Latin America, shows that rural households derive a significant proportion of their livelihoods from employment (Adams, 1999 and Barrett *et al.*, 2001). Barrett *et al.*, (2001) indicate that many rural households are becoming more actively involved in non-farm activities in developing countries. He further identified non-farm activities as a set of non-agricultural activities carried out in the rural setting. Barrett *et al.*, (2001) stated that rural households with the opportunity to diversify into non-agricultural activities have better welfare than those in areas without any of these opportunities. There is a greater likelihood that households around dairy projects will adopt farming activities that are closely linked to dairy projects. For example they are likely to produce products like grain that are in great demand by the dairy projects because they are used in animal feeds.



**Figure 2 Household sources of income** (Stifel, 2010; Corral & Reardon, 2001)

### 2.10.1 Wage income

Wage income consists of all the income received in the form of employee compensation, either as cash or in kind. Since it is common for household members to simultaneously hold more than one job or to change jobs during the survey reference period, all income from primary, secondary and any additional jobs held in a 12-month period were considered as individuals' pluri-activities (ILO, 2003). The value of individual livelihood contributions to household income is important for understanding livelihood dynamics. Besides wage income, social grant income is arguably the most important safety net against (Bank *et al.*, 2010). Dairy projects operating in the rural areas where households rely mainly on social grants as their source of income are likely to reduce the pressure on social grants. Some household members interviewed in the study worked at the dairy projects and reported that they did not get government grants because they were earning an adequate wage.

### **2.10.2 Self-employment**

The self-employment category includes the income earned from all non-farm household enterprises, all cash and in kind earnings and non-durables as well as recurrent expenditures for all non-farm businesses operated by any member of the household over a 12-month period (Carletto *et al.*, undated). As is the case in high-paying professions such as law and medicine in post-industrial countries, skills and educational attainment serve as substantial entry barriers to high-paying non-farm employment or self-employment in rural Africa (Barrett *et al.*, 2001). The dairy projects in rural areas are more likely to promote self-employment for households around the project as they support students doing agricultural courses at various institutions of higher education (Fort Hare dairy manual, 2008). Most rural families have multiple income sources, which may include off-farm wage work in agriculture, wage work in non-farm activities, rural non-farm self-employment (e.g., trading) and remittances from urban areas and abroad (Ellis, 2000).

### **2.10.3 Transfers (Non-labour)**

According to Carletto *et al.*, (undated) this category refers to both private and public transfers received by the household as a form of non-labour income, both in cash or in-kind, where private transfers primarily refer to incoming remittances. Even though this is the primary reference, it can also include benefits from private organizations and/or associations as well as forms of gifts and contributions not associated with the performance of a job or the provision of a service. The main sources of food for households are markets, subsistence production and transfers from the public programmes or other households (Barrett *et al.*, 2001). One implication of the “diversification as risk management” rationale is that the need for self-insurance is a function of the availability of substitute social insurance, provided through transfers by the government, by non-profit agencies, and by community or family members (Barrett *et al.*, 2001). Carletto *et al.*, (undated) further classified transfers into state-funded pensions and social benefits. Social benefits include welfare support, maternity benefits, and educational transfers. The dairy projects are most likely to reduce household reliance on non-labour income and transfers from government and non-profit agencies as the households will receive a good income from dairy related livelihood strategies at their disposal.

## **2.11 Rural livelihoods and the notion of rural development interventions**

Rural development was one of the strength of the Reconstruction and Development Programme (RDP) since it focused on service delivery issues such as water provision, electricity provision, and infrastructure development with elements of development of rural agriculture (Geyer and Du Plessis, 1994). The democratic post-apartheid government has decentralised economic policies at municipal level. Many strategies have been put in place in the Integrated Development Plans of district and local municipalities. Despite the lack of convincing evidence that agriculture-led growth in South Africa's rural economies has the strength to drive economic reform in rural areas, the South African government has proclaimed rural agricultural development a priority. The emergence of rural dairy projects is likely going to improve infrastructural service delivery in such areas as water provision, communication networks and market access links through provision of road networks.

Chambers and Conway (1998) attacked the biased preconceptions of development planners, most of whom had only a very understanding of rural livelihoods in developing countries. The neglect of local solutions and knowledge, they argued, that development policies and projects could never succeed because they do not understand the hidden nature of rural poverty. The only solution for them and others is to put the poor first. Chambers and Conway (1998) also raise important questions about the inter-relationship between different forms of local knowledge. They suggest that top-down planning results in scenarios where not enough is known about the culture or conditions of an area or target group before a project is embarked upon.

Relatedly, Long (2001) argued that a people-centered approach focuses on what matters to people. It is holistic, and identifies constraints and opportunities regardless of the sector, geographical space or level at which they occur. Scholars such as Sen (1997); Ellis (2000); Chambers and Conway (1998) in their livelihoods framework, Cammack (1999); and Escobar (2000) in their developmental debates, have all debated and criticized the top-down approach to development. Long (2001) developed his people-centered approach to development in response to development theories that visualized development in terms of a progressive movement towards technologically more complex and integrated forms of modern society. These theories were based on universalized assumptions about modernity that were historically western.

Western development thinking often assumes that local cultures, and what is called 'peasant traditionalism,' are obstacles to development.

What Long (2001) calls an 'actor-oriented approach,' has consistently demonstrated that, far from being irrational, people in poor rural areas are open to change if they perceive it to be in their interests. They often know far better than development planners how to strategize to get the best from difficult circumstances, yet modernization strategies rarely, if ever, pay heed to local knowledge. Indeed local culture is generally either ignored by planners, or treated as a constraint (Gardner and Lewis, 1996). Dairy projects in rural areas are likely to break the cultural bandages in various rural areas and impart modernity into households around them.

Development also ignores the political implications of growth on the micro level. Premised on the notion of a trickle down effect, it assumes that once economic growth has been attained, the whole population will reap the rewards. The above debates reflect the assumptions of the National and Provincial government stance to rural development in South Africa. They assume that implemented projects such as rural dairy projects are benefiting their surrounding communities.

Disastrously for the poorest in the rural areas, the modernisation theory does not distinguish between different groups within societies. This is either because it assumes these to be homogenous (the mass poor) or because it believes that the ultimate ends of development plans are increased and distributed resources and interests (Gardner and Lewis, 1996). The complexities of the rural set up in the study areas cannot easily be explained through this 'modernisation theory' which often underpins development. This is because it is out of synch with the socio-economic, cultural and political environments that form rural development and rural livelihoods. Long (2001) argued that only by throwing the net wide, are we able to examine the consequences of specific interventions for the already existing autonomous or endogenous modes of development and organisation (Long, 2001). In this respect, it is crucial to explore the relevant operational or management units and the patterns of resource allocation, exchange and communication that interconnect the rural poor in the Eastern Cape.

## 2.12 Dairy projects and diversification of livelihood strategies

Households' livelihood diversification has been defined by Ellis as 'the process by which rural households construct an increasingly diverse portfolio of activities and assets in order to survive and to improve their standard of living' (Ellis, 2000). Barrett *et al.* (2001) suggest that 'diversification patterns reflect individuals' voluntary exchange of assets and their allocation of assets across various activities so as to achieve an optimal balance between expected returns and risk exposure, conditional on the constraints they face'. If appropriate interventions are to be effective in reducing rural poverty, and vulnerability to poverty, it is important to have an understanding of households' livelihood diversification strategies and the extent to which these strategies are feasible.

In planning and carrying out activities, people use a variety of strategies, with livelihood security and well-being in mind as their desired outcomes. There are three possible clusters of such strategies employed by the rural household to construct their livelihood (Scoones, 1998). They may seek to obtain their livelihood from agriculture, they may diversify to non-farm economic activities or they may migrate temporarily or permanently to cities. In most cases, rural dwellers make use of a combination of these strategies to avoid risks and at the same time achieve their desirable outcomes. These desirable livelihood outcome require assets which should not merely be viewed as a means through which they make a living. These assets give meaning to the person's world while at the same time offering a livelihood that is sustainable and allows the individual to cope with life in general and recover from stresses and shocks.

Swift and Hamilton (2001) defined a livelihood as capabilities, assets (both material and social) and activities required for a means of living. An understanding of social structures and processes through which sustainable livelihoods are achieved is very important. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (Swift and Hamilton, 2001).

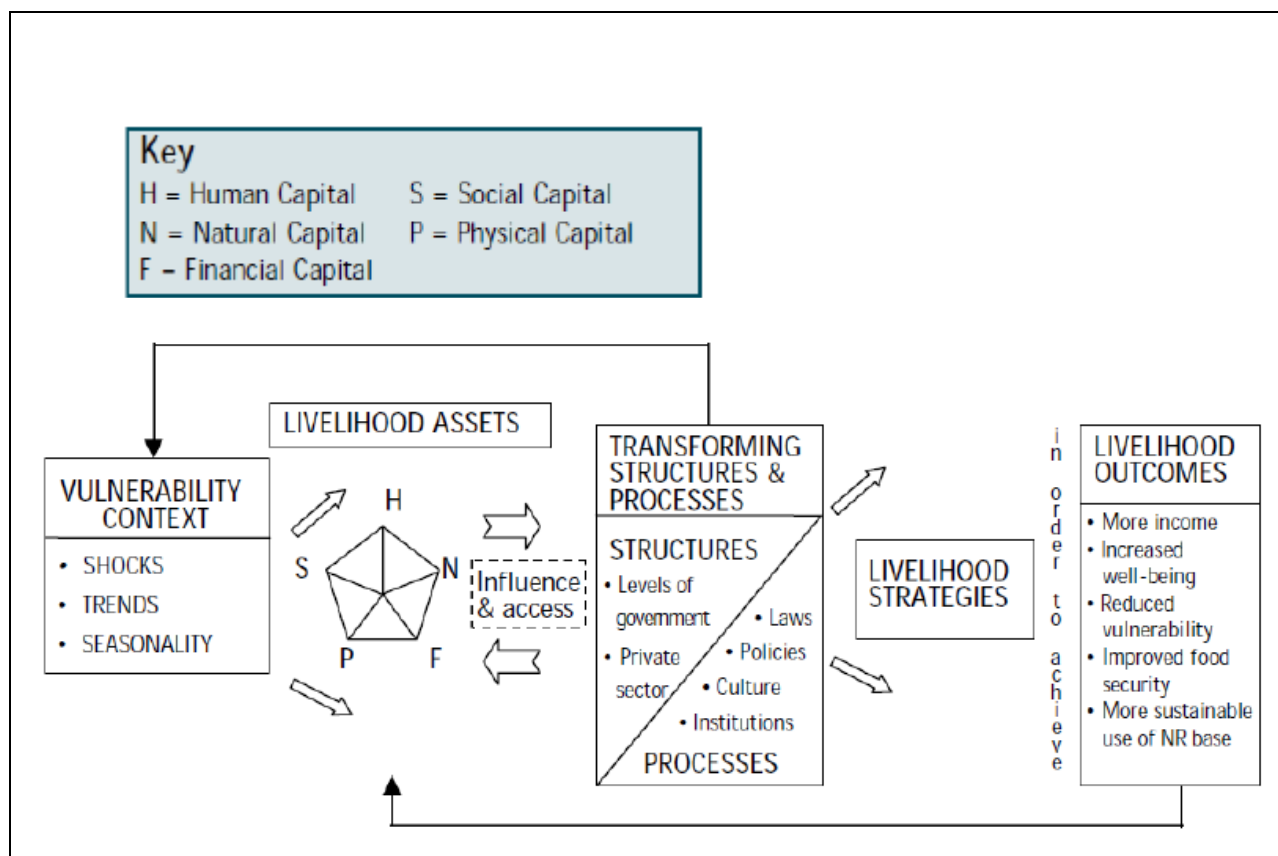
Given the foundations laid in the previous sections, it is now possible to illustrate the role played by dairy projects in rural livelihoods in South Africa. It is important to note that every resource

(livestock, land, water) that households have, has a local and particular importance to them. Rural people use these resources in their own ways regardless of local government and other institutions' initiatives to bring development, alleviate poverty and improve livelihoods (Chambers and Conway, 1998). Links between the dairy sector and poverty reduction or alleviation in rural livelihoods, implies that dairy projects provide employment (Thomas *et al.*, 2005), which has a positive contribution to rural households' standard of living.

### **2.13 Sustainable livelihood framework**

Livelihoods outcomes are important because they help the analyst to understand the results of peoples' livelihood strategies in a particular context. That is, why people take on particular strategies, what their priorities are, and how people are likely to respond to new opportunities or constraints. Certain households use the dairy projects as a market for their farming products while other households get male calves to start beef production as way of making a living.

Assets which people can rely upon play a crucial role in the livelihoods framework. Those with more assets are more likely to have greater livelihood options with which to achieve their goals and reduce poverty. Five categories of assets or capital have been identified (DFID, 2008). These are human, social, natural, physical, and financial. These categories are combined in order to achieve livelihood goals. A major influence on people's choice of livelihood strategies is their access to assets and the policies, institutions and processes that affect their ability to use these assets in order to improve their livelihood. Livelihoods approaches try to understand the strategies adopted and the factors that affect the households' choice of a livelihood strategy. They also try to re-enforce the positive aspects of these strategies and mitigate against constraints. This is further illustrated by the sustainable livelihood framework shown in Figure 3.



**Figure 3 Sustainable livelihood framework**

Source: DFID, 1999

## 2.14 Dairy projects as a rural poverty alleviation tool

The importance of dairy projects in economic development goes beyond their contribution to growth in national income, the livelihoods of rural people and meeting nutritional requirements of increasing populations. Dairy projects also play a key role in the reduction of poverty in rural areas since poverty and food insecurity are closely related (Sen, 1981). Households that are employed by the dairy projects indicated that they have enough income to purchase food for their families. This highlights the fact that dairy related employment is a poverty alleviating tool to households around dairy projects. Van Zyl and Kirsten (1992) argue that In South Africa, poverty is one of the main causes of food insecurity. People are said to be living in poverty when they lack resources or money needed to satisfy their basic needs (Sen, 1981). Argumentatively, food insecurity should not be seen as a problem of inadequate food supply only, but also as a problem of inadequate purchasing power (Sen, 1981). Besides dairy projects offering job

opportunities which enable people living in communities with functioning dairy projects to have money from dairy wages, they also satisfy their basic needs, meeting one of the Millennium Development Goals of reducing the proportion of people whose income is less than \$1,25 a day (World Bank, 2011). The dairy projects also promote farming of field crops in the area as they offer competitive market for the agricultural produce. This leaves the households near the dairy projects with enough income to meet food requirements and thus fights poverty in the rural areas.

### **2.15 Role of dairy projects in increasing rural productivity**

Developing countries are characterized by low levels of productivity of land, labour and capital in almost all sectors of the economy, this is particularly true in agriculture and allied sectors in rural areas (FAO, 2010b). Dairy development directly and indirectly raises productivity and provides the necessary preconditions for increasing productivity. For example dairy development impacts on agricultural research and extension as well as providing mentorship and skill development through dairy enterprises. This gives households an incentive to increase their productivity and incomes (FAO, 2010b).

Agricultural growth is critical to sustaining poverty reduction since about 75 percent of the world's 1.2 billion extremely poor are estimated to live in rural areas and derive a non-negligible part of their income from agriculture and / or agriculture related activities (World Bank, 2008). The pace of poverty reduction does not only depend on the overall rate of agricultural growth, but also on the ability of poor households to participate in that growth. In other words, it depends on the quality or inclusiveness of the growth process (Ravallion *et al.*, 2007). Macro-economic studies show that increases in livestock productivity contribute to GDP growth and generate significant consumption and production linkages (Christiansen *et al.*, 2006). The growth of rural dairy projects widens the livelihood options that the rural household around the dairy projects can undertake and provides them options to reduce risk.

### **2.16 Dairy projects and rural food consumption and nutrition**

Milk and milk products have been used by man since prehistoric times. Milk is a balanced, nutritious food that is important to household food security in many rural economies. Furthermore, milk and dairy products play an important role in human nutrition and contribute to

economic development. According to Bertail *et al.* (1999), rural households are more likely to have a higher proportion of home produced food in their diet than urban households do, given their easier access to the means of production such as gardens and dairy cows.

Hendriks (2003) argues that nutritional gains from agricultural food producing activities, including dairy farming and home gardens, are only possible if households produce beyond subsistence levels. Dairy products contribute significantly towards achieving a nutritious diet for most of those who consume them. This is supported by the fact that milk is the first natural food given to every human being. Felleke and Geda (2001) suggests that the demand for milk depends on many factors including consumer preference, consumer's income, population size, price of the product and the price of substitutes. Felleke and Geda (2001) indicate that the demand for milk is inelastic with respect to income and price. In general, increasing population growth, raising real income and decreasing consumer prices are expected to expand the demand for milk and milk products.

The issue of food insecurity has been critical in many parts of the world including South Africa. The right to food is enshrined in international and national law. In South Africa, food security received much attention after 1994, when South Africa became a democratic country. The right to have access to sufficient food was embedded in Section 26 and 27 of the South African Constitutional bill of 1996. The constitution indicates that every South African citizen has a right to sufficient food, water and social security. In light of the above, the Department of Agriculture, Forestry and Fisheries was mandated to develop agricultural policies and support programmes to ensure that South African citizens were given agricultural opportunities that would enable them to meet their basic food needs. This support has resulted in the establishment of large scale dairy projects operating in rural areas of South Africa's Provinces, including the Eastern Cape.

In the 2010/2011 financial year food, security was reprioritised as one of the top priorities of the South African government (State of Nation Address, 2010). This is in line with South Africa's millennium development goal, which aims to halve the proportion of people who go hungry over the period 1990 and 2015 and to halve poverty and unemployment by 2014. The Department of Agriculture, Forestry and Fisheries (DAFF)'s major role is to ensure that opportunities are created to encourage South African citizens to participate in agriculture and to reduce food insecurity in the country. The department has since initiated a number of programmes that are

meant to contribute positively to food security in the country. Part of this is the implementation of rural dairy projects.

## **2.17 Contribution of the dairy industry to the GDP of South Africa**

Dale (1995) notes that only rural industrialization can transform a subsistence economy into a market economy. The introduction of large-scale industries within rural areas seems fruitful for many reasons. Firstly, it encourages the process of farm diversification by creating a market for agricultural products, raw material for processing, perishable foodstuff for consumption by industrial workers and provides farming inputs. Second, introducing large-scale industries provides employment (Weitz, 1982). Weitz (1982) subscribed to the above view and states that the industrial enterprises capable of being integrated into rural areas should be classified according to small farmers' needs and their production. Johnston and Kilby (1975) argue that agriculture is no different from other sectors of the economy in that specialisation (and the ensuing trade) is the "mechanism" driving productivity growth and income expansion.

Milk production in South Africa makes a very small contribution to worldwide milk production but in terms of agricultural production domestically, it is the fifth largest agricultural contributor to the country's Gross Domestic Product (South Africa Agricultural Statistics, 2010-11). Analysing the statistics released in 2009 by South African Agricultural Statistics, exports of dairy products amounted to 41 000 000 kg, valued at over R521 million. Foreign currency was received for these sales resulting in a boost in the foreign currency reserve. Even though South Africa exports dairy products to the world markets, it is also an importer of dairy products. The average import value over the past ten years amounted to over R 440 million. In quantity terms this amounted to over 28 million kilograms (South Africa Agricultural Statistics, 2010). This gives an outlook on the importance of dairy projects in boosting the economy at large, as well as the economic wellbeing of individual households.

The global dairy industry continues to evolve for a variety of reasons. These include consolidation and regional shifts in production and processing, offering variety and changes in consumer demand for dairy products. This is partly as a result of shifting demographics and dietary habits, and increasingly competitive pressures from other food and beverage industries. These trends have contributed to a rising interest in evaluating the regional economic impact or

contributions of the dairy industry for individual states, regions, and nations as a whole (Cryan, 2004; Deller, 2007). Current measures of the economic impact of dairy projects includes output or revenue, value added, employment (including full-time, part-time, and seasonal positions), labor income, property income, and indirect business taxes paid to local, state, and federal governments. Value added is a broad measure of net economic activity and is comparable to the Gross Domestic Product (GDP). It represents the sum of labour and property income, indirect business taxes, and capital consumption (depreciation) (Hodges *et al.*, 2008).

Omore *et al.* (2004) found that in Kenya, between 0.3 multiplier to 2.0 direct and indirect jobs are created for every 100 litres of milk traded, depending on the enterprise type. FAO (forthcoming) estimates that in sub-Saharan Africa, livestock sector multipliers, average US\$2.9 in primary livestock production and US\$5.9 in processing. These Livestock sector multipliers are measured by the incremental effect of US\$1 additional spending on aggregate national household incomes. These household multipliers are larger than those for alternative sectors and the benefits of livestock sector growth are usually relatively equally distributed because of a web of indirect linkages across distribution, processing and marketing activities. Many of these links are with low-income households.

## **2.18 Role of institutions and organizations on dairy projects**

Dairy project development is expensive and the profitability of dairy production is critical in justifying both short-term and long term viability of an enterprise. Because of this, Rukuni *et al* (2006) conclude that effective management is needed to enhance efficiency, cost recovery and to sustain the whole system. The purpose of new institutional economics is to explain the operations of institutions, their development over time and how they impact on economic development (Nabli & Nugent, 1989). Williamson (1979; 1985; 2000) refined the Coasian arguments about property rights and transaction costs and coined the phrase ‘New Institutional Economics’. New institutional economics is distinct from old institutional economics developed by Commons and Veblen (Paarlberg, 1993), in that old institutional economics operated outside neoclassical economics and had no theory apart from postulating that institutions were a key factor in explaining and influencing economic behaviour.

Scoones (1998) put a particular emphasis on the study of these processes. Institutions and organizations facilitate and mediate the complex process of achieving a sustainable livelihood. For the purposes of sustainable livelihoods, Scoones (1998) defines institutions as regularised practices (or patterns of behaviour) structured by the rules and norms of society, which have persistent and widespread use. Thus, institutions may be both formal and informal. Institutions are also dynamic, continually being shaped and reshaped over time.

According to Davies (1997), cited by Scoones (1998), institutions are the social cement that links stakeholders to access to capital of different kinds and to the means of exercising power. As a result they define the gateways through which stakeholders pass on the route to positive or negative adaptation. This means that institutions are part of a process of social negotiation rather than fixed objects. These organisations are mainly responsible for public relations, teaching and training, publishing, and other information dissemination activities (Rundgren, 2006; Parrot *et al.*, 2006). The understanding of institutional processes is important for the policy and practice of development for sustainable livelihoods. It allows for the identification of restrictions and opportunities to sustainable livelihoods, enabling dairy projects to negotiate with existing institutions in the rural areas of operation. This is necessary for dairy projects to be accepted without any conflict. Interventions in support of sustainable livelihoods are likely to be successful if attuned to existing institutions.

### **2.19 Gender and rural livelihood strategies**

It has been argued by Rime and Giovanni (1986) that “men appear to experience hunger [differently] than women in a more specific physical way.” It was also suggested that men described hunger differently than women (Macht, 1999). The US module, for example, was formulated with the explicit purpose of “understanding hunger from the perspective of women who had experienced it and to construct and evaluate indicators to measure hunger directly in similar populations” (Radimer *et al.*, 1992). Most cross-cultural applications of the US core module approach have also only interviewed women (Maxwell *et al.*, 1999; Derrickson and Anderson, 1999; Studdert, *e. al.*, 2001). It has generally been argued that female-headed households are more vulnerable to food insecurity and non-income aspects of poverty. For example, cultural restrictions on women’s ability to participate fully in food production activities in some of the poorest areas of South Asia have left them particularly vulnerable in times of

economic crisis (Kabeer, 1990). The error of the previous era can be corrected by the introduction of dairy projects in rural areas to address cultural norms that restrict women's participation in high return activities. In these dairy projects one must look at offering activities without gender bias.

McLanahan (1985) found that children in female-headed households had a lower rate of socio-economic attainment than children in the male-headed households. If female-headed households utilize all the available resources to survive, including engaging school going children in income generating activities, they end up with low education level attainment, and thus a greater probability of transmitting poverty and food insecurity to the next generation. These poverty cycles attached to gender are likely to be broken in communities with dairy projects since dairy projects will offer all their activities without regard for gender. Kennedy and Peter (1992) found that greater proportions of income controlled by women had a positive influence on household caloric intake.

## **2.20 Dairy and gender**

Gender dynamics are one of the complexities considered in rural livelihood analysis. Gender is an integral and inseparable part of rural livelihoods. While gender incorporates both sexes, the main focus in gender related issues is on empowering women, providing equal rights for women and protection against discrimination of women. One of the eight Millennium Development Goals focuses solely on gender. The third Millennium Development Goal focuses on promoting gender equality and empowering women (MDG monitor, 2009), because, as argued by the FAO, (2009) that a person's gender is a key determinant of his or her access to resources. Globally, women in rural areas benefit less from self-employment and wage employment than men do.

Men and women differ in the assets they possess, in their access to resources and in the opportunities they are offered (Mtshali, 2002). As argued by Ellis (1999), in Mtshali (2002), that women's disadvantaged position in society should be considered in any programme to improve household livelihood security. Desai and Potter (2008) argued that, all major development agencies include a mandatory framework for all activities to check that gender is considered even in neutral projects. In addition to well-documented gender disparities in education, studies

throughout Africa and South Asia have found that women routinely have less access to agricultural extension than their male counterparts do (Gilbert *et al.* 2002).

### **2.21 Environmental issues in dairy systems**

Like virtually every other sector of agriculture, the environmental impact of dairy farming produces contradictory responses from parties with different environmental interests. To some, intensification is seen as the major villain because it is associated with pollution, eutrophication, low biodiversity and landscape simplification (Willeke-Wetstein, 1997). To others, the neglect and abandonment of dairy farming is linked with the decline of valued habitats, reduced biodiversity and changes in landscape character (Petretti, 1996).

According to researchers from Stanford University, the United Nations Food and Agriculture Organisation (FAO) and other organisations, the harmful environmental effects of livestock production are becoming increasingly serious at all levels (locally, regionally, nationally and globally), and urgently need to be addressed. FAO (2010b) reported livestock production as one of the major causes of the world's most pressing environmental problems. These environmental concerns included global warming, land degradation, air and water pollution, and loss of biodiversity.

Notwithstanding the complex relationships between intensive dairy systems and their environmental impact (Willeke-Wetstein, 1997), (de Haan *et al.*, 1997) suggests that it is becoming increasingly recognised that many traditionally managed landscapes have stabilised with respect to local levels of exploitation, and are, for all practical purposes, self-contained and sustainable (de Haan *et al.*, 1997). The harmony between the environment and human economic exploitation was probably common throughout Europe until modern attempts to increase production through intensification were applied on a large scale. CO<sub>2</sub> emissions from agriculture do not in general contribute greatly to greenhouse gases, for example, in Germany only 2.4% of carbon dioxide emissions are the result of agricultural production (Trunk, 1995).

## **2.22 Chapter summary**

The Literature review has shown that rural households undertake various livelihood strategies to improve their welfare. Various community based resource management initiatives and rural development project increase the rural livelihoods portfolio of households so that they can diversify into superior strategies that have high income returns. This is as long as the activities of projects complement those of rural households. The literature also supports the idea that there are socio economic and household barriers that constrain rural households from undertaking high - return livelihood strategies. There is a pool of contradicting literature related to the classification of household sources of income, but in order to meet the objectives of this study, the classification system advocated by (Stifel, 2010; Reardon *et al.*, 2001) was adopted.

## **CHAPTER 3: DESCRIPTION OF STUDY AREA AND METHODOLOGY**

### **3.1 Introduction**

This chapter explains the study location; it highlights the picture of the study area, starting with the provincial location and proceeds to the specific districts from which respondents were selected. A brief agro-ecological summary of the study area is also presented. It looks specifically at climate, vegetation and demographic data related to the study area. The chapter also describes the services available in the local municipality, governance aspects of the municipality, and activities that the communities are engaged in. The techniques or methods used to collect all the relevant data needed for the study were also explained.

### **3.2 The study area: Nkonkobe Municipality in Eastern Cape**

The research was conducted in the Nkonkobe municipality in Eastern Cape Province of South Africa. The Eastern Cape is one of nine provinces in South Africa, located in the south-eastern part of the country along the Indian Ocean seaboard. The Eastern Cape Province officially came into being after 1994 when South Africa was subdivided into nine new provinces. The East Cape was combined with the Ciskei and Transkei homelands. Use of the natural vegetation for animal production dominates natural resource management in the Eastern Cape because crop production potential is limited (Van Averbeke, 2000).

A shortage of basic services remained central to the majority of the population of the Eastern Cape. The remote rural areas of the former Ciskei and Transkei, have presented enormous challenges to the land claim, land restitution and land redistribution reform policies introduced by the state since 1994; the Transkei presenting more of a challenge than the Ciskei (Kingwill, 2000 p. 213; Van Averbeke, 2002 p. 9). This has had an impact on the establishment of the dairy projects described in this study since they require large areas of land. Many community land owners view the establishment of such projects as a new form of land grabbing. The land ownership patterns in the Eastern Cape shows that 28 percentage of the Eastern Cape land is state and communal land; 2 percent is redistributed land; 0.6 percent is restituted land and 69.2 percent is privately owned (Frans, 2011). According to Lahiff (2003), the land is still used (in

descending order of importance) for sheep farming, beef cattle farming, mixed farming, dairy cattle farming and vegetable production.

Eastern Cape provincial policy aims to raise the level of agricultural production in the former homelands by promoting the sustainable use of agricultural resources, through market-orientated agricultural production and the assistance of resource-poor farmers. The main objective is to satisfy household food security through implementation of rural projects like dairy projects, that widen scope of rural livelihood strategies.

### **3.3 Climatic conditions, soil types and rainfall patterns in Knonkobe Municipality**

The Nkonkobe municipality is in the Eastern Cape Province. It is a semi-arid region. The Eastern Cape is a climatically diverse area, both in terms of rainfall and temperature. The Nkonkobe area experiences long dry spells but ordinarily rainfall is between 450 and 700mm per year (Van Averbeke, 2000). The Eastern Cape as a whole contains four rainfall regimes. The northern and inland parts of the Eastern Cape Province experience summer rainfall (Heydorn and Tinley, 1980). At a local level, rainfall is influenced by topography. The Eastern Cape therefore incorporates aspects of both winter and summer seasonal rainfall. Mean annual precipitation varies considerably across the Eastern Cape, from 300 mm per annum in the west, to 1000 mm per annum in the east (Graf, 1988). Eastern Cape rain producing systems include orographic forcing systems, frontal activity systems, convective action systems and tropical storms (Graf, 1988). This adds to the climatic diversity of the province.

### **3.4 Resource management systems in the study area**

Use of the natural vegetation for animal production dominates natural resource utilisation in the Eastern Cape, because crop production is limited by climatic, topographic and geological factors (de Wet and van Averbeke, 1995). The province covers an area of about 17 million hectares. About four million hectares of this has a long history of being used for mixed farming by Africans, with communal pastoralism being one of the key activities. Most of this land is located in the eastern half of the province, and has a fairly wet, subtropical climate. The west and large parts of the north and mid-south of the province are used by white farmers for commercial livestock production (de Wet and van Averbeke, 1995).

Much of the remainder of the land consists of protected areas. As noted by de Wet and van Averbeke, (1995), livestock farming dominates the agricultural scene in the Eastern Cape. From farms surveyed by de Wet and Van Averbeke (1995), 74 percent reported that livestock were their dominant products (accounting for 75% or more of income) while 8% reported that horticulture dominated. Only 1% was dominated by field crops. Mixed farm enterprises with no dominant income source accounted for 12% of farms (de Wet and Van Averbeke, 1995). Citrus production is highly successful along several rivers where irrigation water is abundant. This is the case particularly along the Sundays and Cat Rivers. Some schemes were devoted primarily to production of livestock fodder in an attempt to avoid overgrazing of the veld and the degradation of grazing land. In general, the communal areas were significantly more degraded than the commercial farming areas. Settlement areas with the highest soil degradation index values included Herschel, Qumbu, Mount Fletcher, Engcobo and Middeldrift (Hoffman, 1999).

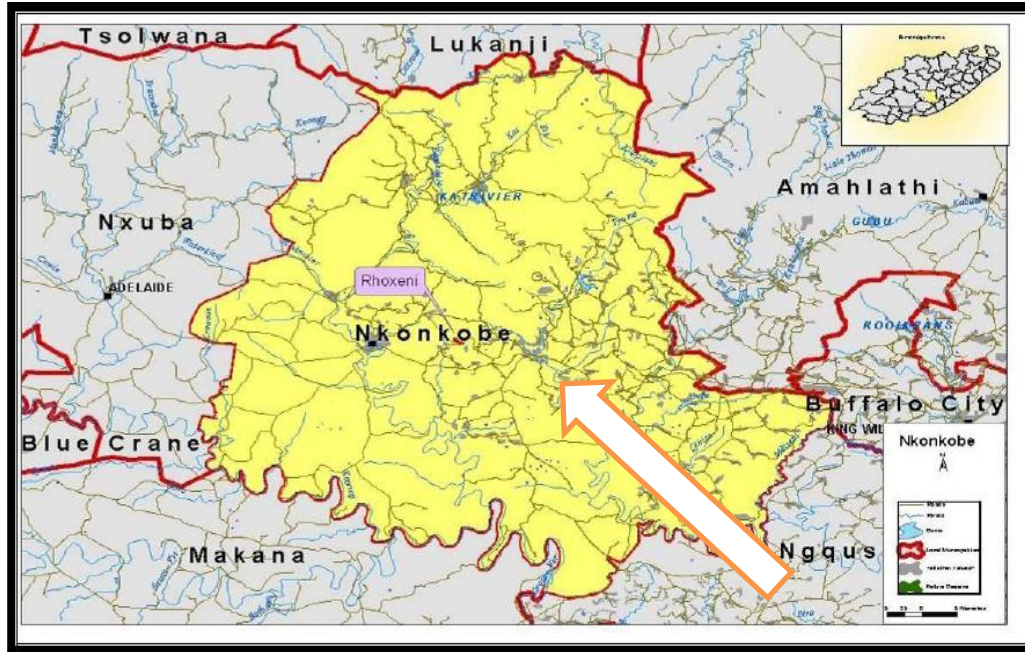
### **3.5 Dairy farming in the Eastern Cape**

The Eastern Cape is one of only a few areas in the country where the dairy industry is showing a growth in production despite economic challenges (Matthews, 2011). Currently, the Eastern Cape produces 25% to 30% of the country's milk (Matthews, 2011). Among the established dairy projects in the Eastern Cape are the Fort Hare Dairy Trust and the Middle-drift Dairy Farm. The Fort Hare Dairy Trust was established in 2007. It is an 800-cow commercial dairy operation. It also has incorporated into it, teaching centres, to train students in farm management. The Middle-drift dairy, once it reaches full capacity, will be a 600-cow dairy farm (MPO, 2011). Clover Dairy buys and sells all the milk produced on these farms.

### **3.6 Baseline information on the District and Local Municipalities in the study areas**

The following section provides the description of the District and Local Municipalities of the study. It essentially provides some baseline information drawn from the Integrated Development Plans and related information, especially via Statistics South Africa.

### 3.7. Nkonkobe Municipality Demographic analysis



**Map 3.1 Nkonkobe Municipality Map**

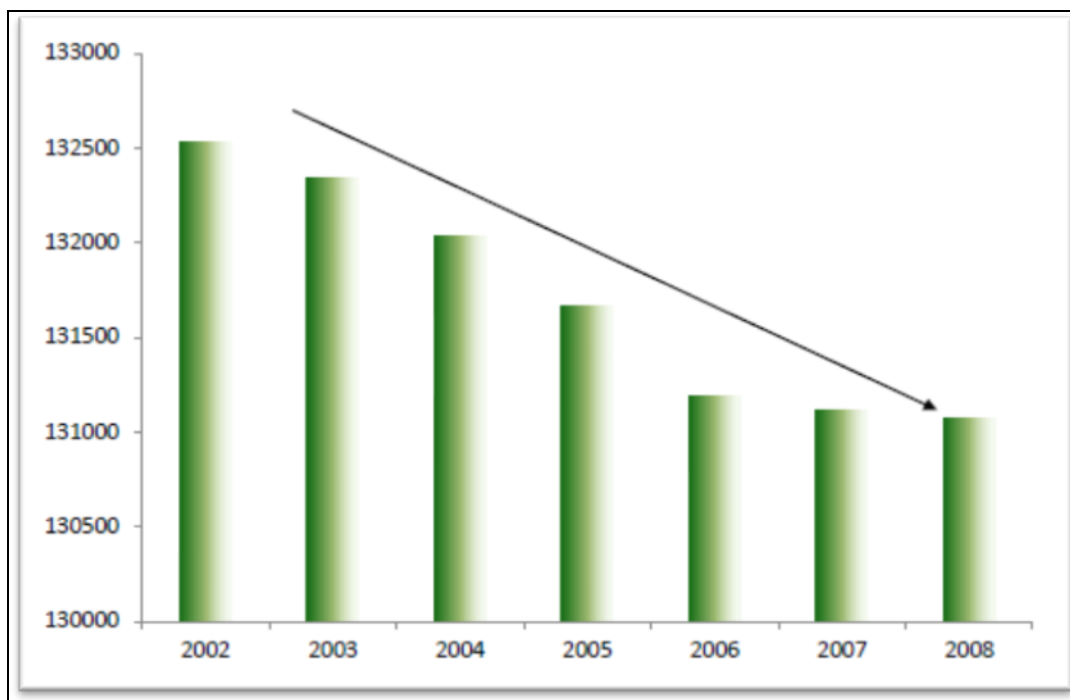
**Source: Nkonkobe Municipality (2005/6)**

Nkonkobe Local Municipality is a product of the amalgamation of Alice, Fort Beaufort, Hogsback, Seymour, Victoria East, Mpofo and Middledrift. It is the second largest Local Municipality (LM) in the Amathole District Municipality, covering 3 725square km. Nkonkobe Local Municipality has a population of 160 311 people, with 20% living on farms and 61% in villages in the rural areas. The establishment of the projects will thus provide employment to the rural households. Only 19% of residents live in the urban settlements of Alice and Fort Beaufort (see Figure 9). The economy of the municipality continues to be reliant on the public sector for job creation (Nkonkobe Local Municipality IDP, 2005/6). The agricultural sector in the area has been hailed as an area of great potential, but at the moment, Nkonkobe continues to report high levels of poverty. Statistically this means that 92 274 people in the municipality regularly go to bed without anything to eat (Nkonkobe Local Municipality IDP, 2006/7). Agriculture is currently an underdeveloped sector, contributing only 17% to district Gross Domestic Product. The municipality is rural in nature, so agriculture is the sector with the greatest economic potential in the municipality. The municipality will therefore benefit greatly if dairy production becomes viable in the area.

### 3.7.1 Demographic indicators of Nkonkobe Municipality

#### Total population

According to Global Insight, in 2008, Nkonkobe Municipality had an estimated total population of 131 071 in 28 259 households. There are 21 wards within the Nkonkobe municipal area. Approximately 74% of people living within the Nkonkobe municipal area are indigent. The majority of the population of Nkonkobe (72%) resides in villages and farms, and 19% resides in urban settlements. Urbanisation is mainly concentrated in Alice and Fort Beaufort.



**Figure 4 Total population of Nkonkobe Municipality**

**Source: Global Insight (2008)**

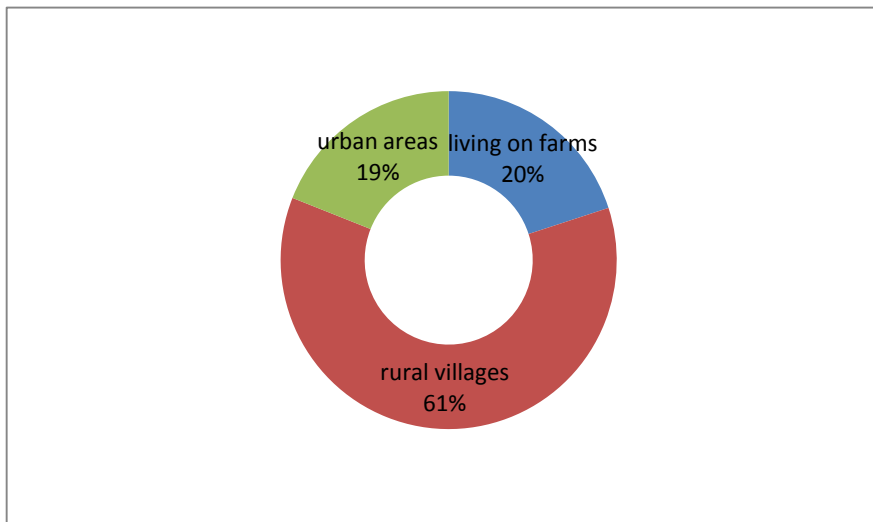
Figure 4 shows that the population of Nkonkobe Municipality is declining. The bar chart shows that the population of Nkonkobe municipality has declined from 132 500 in 2002 to 131 100 in 2008. According to Global Insight (2008), the population has been showing great signs of decline since 2005, due to residents migrating to big cities in search of high paying employment. The provision of more livelihood options to rural areas through support of the implementation of

dairy projects, will reduce this movement of households from rural areas to cities. This will happen as high paying livelihood strategies become available in rural areas.

### 3.7.2 Age and gender distribution

Global Insight 2008 statistics indicates that 60% of the Knonkobe municipality's population is female, and 40% are male. The disparity is more than that of the national average of 49% male and 51% female (Statistics South Africa, 2011). This disparity might be caused by the males taking the risk of migrating from the rural areas to towns in search of high paying livelihood options. About 60% of residents of the district are children in the school going age group (5 – 19 years). About 7% fall within the pension age group. Only 33% are in the working age group (20 – 64 years). This means that there is a high dependency ratio since 67% of the population depend on the 33% workforce to provide their economic needs. There is likelihood that if dairy projects are implemented in most of the rural areas, the dependency ratio will be lowered since households will find high paying livelihood strategies that will enable them to improve their welfare.

### 3.7.3 Nkonkobe Local Municipality population distribution



**Figure 5 Nkonkobe local municipality population distribution**

**Source:** (Nkonkobe Local Municipality IDP, 2008)

Figure 5 above shows the population distribution of Nkonkobe municipality; reflecting the percentage of people in rural areas, urban areas and those living on farms. The population distribution of Nkonkobe municipality shows that 20% of the total population live on farms and 61% in villages in the rural areas. Some 19% live in the urban settlements of Alice and Fort Beaufort. The urbanisation ratio (Urban/rural) has improved from 4.1 in 2001 to 2.6 in 2008 (Global Insight, 2008).

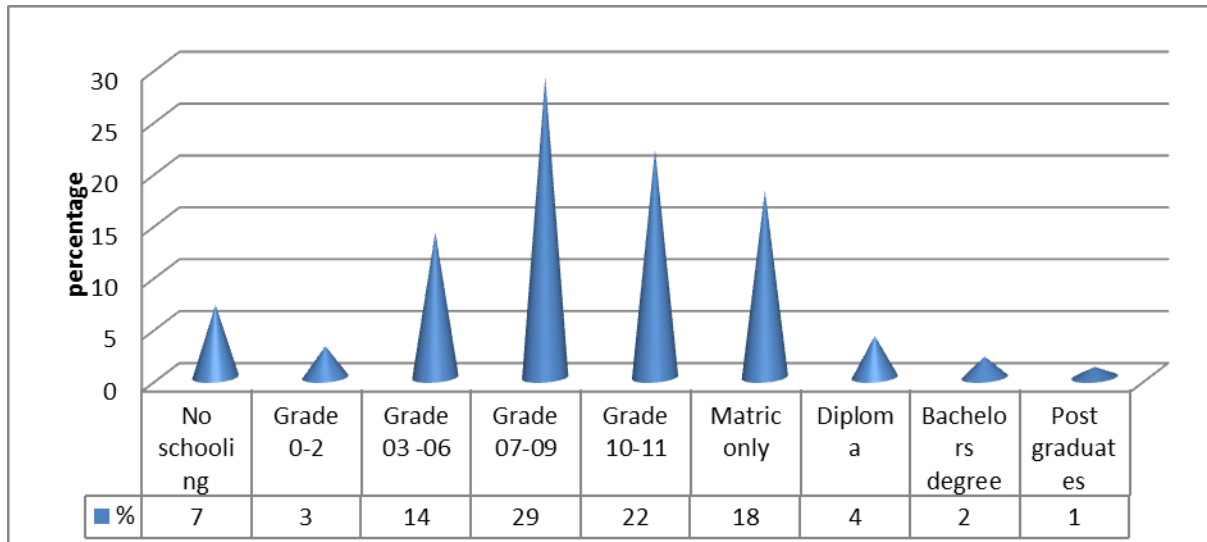
### **3.8 Poverty indicators**

The levels of poverty in Nkonkobe municipality are still very high. This is reflected by the estimates from Global Insight (2009). The total number of people living in poverty is sitting at 52 155 people. This is a slight increase from 2008 when it was 50 000. However, when the number of people living in poverty is considered from 1996, the numbers suggest that it has been decreasing. In 1996 the number of people living in poverty was 80 591 (Global Insight, 2009). The establishment of the rural dairy projects has the potential to close the gap between the rich and poor.

### **3.9 Education**

Nkonkobe municipality is showing improvement in education. This is reflected by Figure 6 below. It shows that about 29 percent of the people in Nkonkobe had acquired grade 7-grade 9 certificates; by 22 percent had grade 10-12 certificates. In terms of functional literacy, the municipality has also shown great improvement. The total number of illiterate people measured in 2009 was 19 541. The figure was 20 811 in 2008 (Global Insight, 2009), these are people with the age of 20 years and have completed grade 7 or other higher grades. In terms of a percentage, literacy is at 70.1% in Nkonkobe municipality (Global Insight, 2009). The challenge of illiteracy is seen by Nkonkobe municipality as one of its major contributors to systemic poverty and unemployment. With only 7% of the population having a tertiary / post matric qualification and 7% with no schooling at all, there is a need to energise efforts to improve education and skills development. The importance of dairy projects for overcoming this challenge is that it has various activities that accommodate people with different level of education. It is most likely that

rural households around dairy projects who are less educated will still be able to get jobs in these dairy projects.



**Figure 6 Levels of education attainment by adult population**

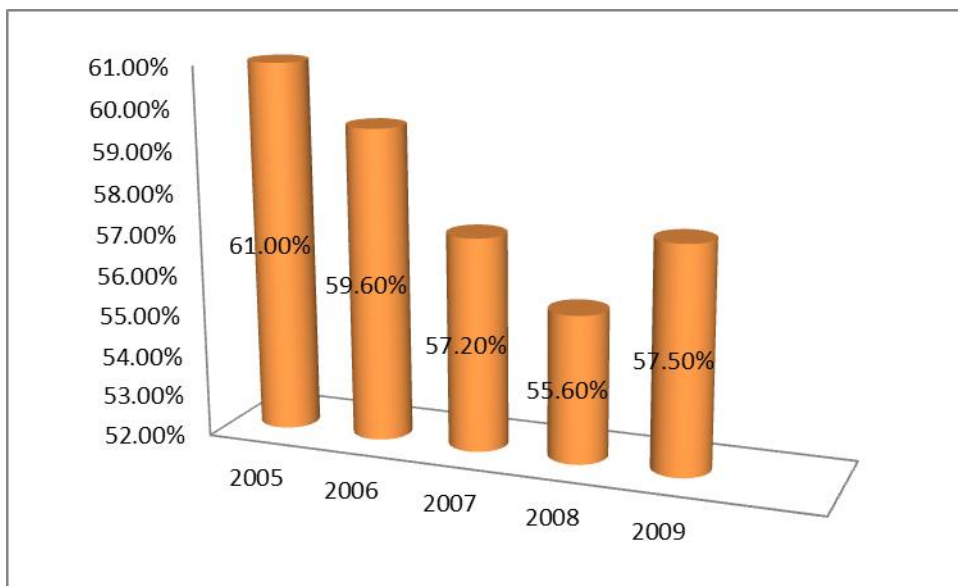
Source: Global Insight (2009)

### 3.10 Unemployment

Nkonkobe municipality still experiences high levels of unemployment. According to the official definition of unemployment, there were 14 766 unemployed people in the municipality in 2009, showing an unemployment rate of 57.5%. Since 2005, the unemployment rate has been dropping. It dropped from 61 % in 2005 to 55.6 % in 2008 due to the implementation of rural development schemes. Poor management of some of the schemes has resulted in the closure of some of the schemes, causing the unemployment rate to increase significantly. As indicated in Figure 7 below, unemployment remains a major challenge for all the municipalities in the district. To improve this situation, there is a need to invest in sustainable economic growth and poverty alleviation, in order to relieve local residents of the agony of poverty and unemployment.

In spite of efforts of policy makers and implementers to eradicate rural poverty through projects and the creation of employment, poverty continues to worsen in rural South Africa, and in the Eastern Cape in particular. Poverty reduction can be seen as a process through which people

progressively gain control over commodities related to survival, well-being and empowerment. Due to poverty, the rural poor look for pathways to sustain a living. Some do this by migrating to other rural towns, villages, cities and to mining areas in search of employment. While migration does sometimes provide a solution to the economic difficulties faced by the poor, it causes a break in social relations and often further exacerbates existing levels of and dynamics related to, poverty locally. The lowest level of unemployment that has been recorded was in 2008. This might be because the rural dairy projects had at that time become fully functional in Nkonkobe municipality and were providing the households with more livelihood options.



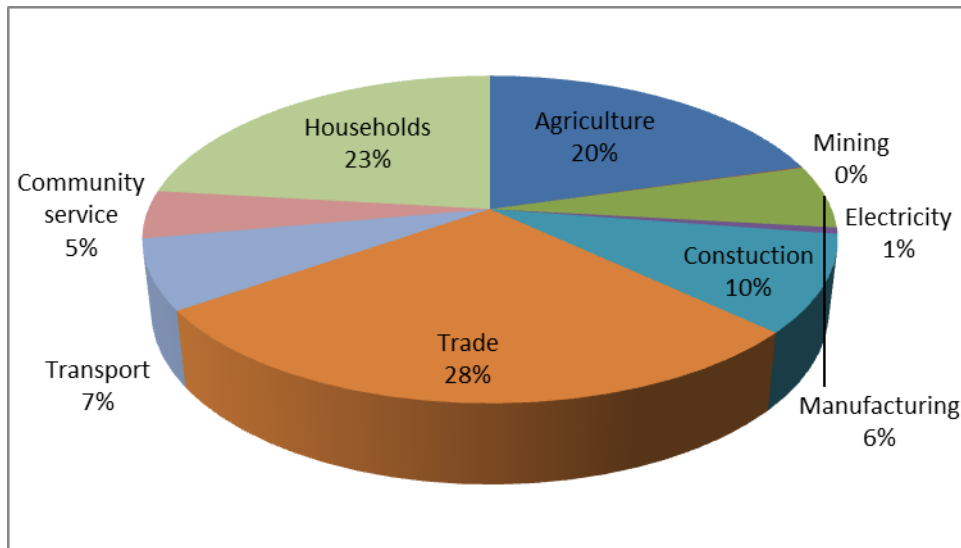
**Figure 7 Unemployment rate from 2005-9**

Source: Global Insight (2009)

### **3.11 Employment**

The total number of people employed in Nkonkobe Municipality is 7 841, as measured by the official definition of employment (Formal Employment). Even though the economy of Nkonkobe has shown positive growth over the last 10 years, due to thinness of the size of the overall economy, very little improvement has occurred in the fight against unemployment (Nkonkobe Municipality Draft Integrated Development Plan, 2011). The inability of the local economy to absorb new job entrants has worsened the unemployment situation. The high

dependence on community services, a limited skills base, a lack of entrepreneurship and lack of private sector investments are some of the contributing factors to the structural unemployment challenge. Figure 8 below shows that the trading sector employs a greater percentage of people than another sector. This is followed by agriculturally related activities.



**Figure 8 Total employment compositions**

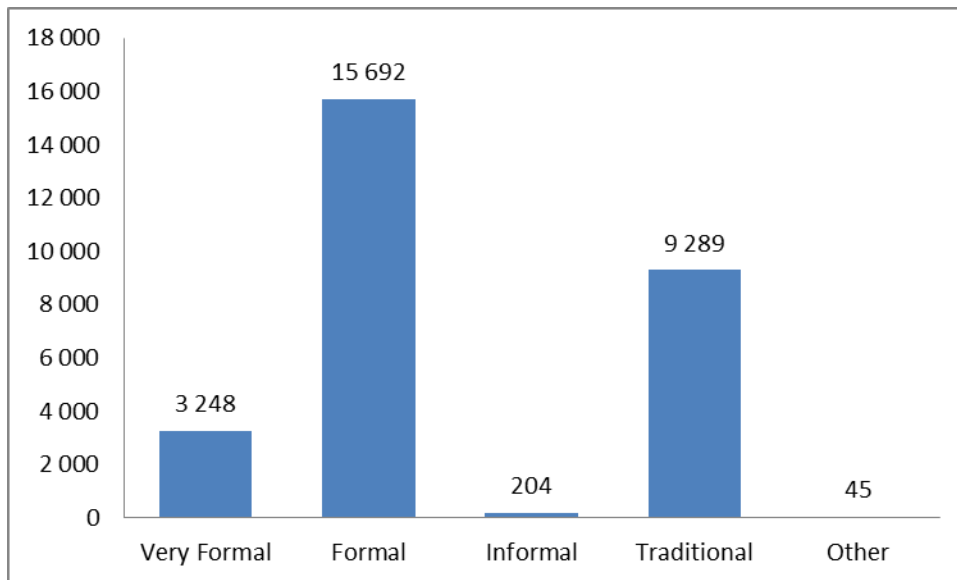
**Source: Global Insight (2009)**

Agriculture plays a significant role in the municipal local economy. The sector contributes 20 % of the municipality's GDP, making it the third most important sector. Cattle, sheep and goats are the common livestock in this area, with sheep being the dominant animal (Obi, 2011). These are kept for sale, for slaughter, for home consumption and for ceremonial purposes. Horses are kept for riding (as a form of transport) and sometimes utilised for drought power. Donkeys are found in very small numbers. The increase in the agricultural sector's contribution to the economy of Nkonkobe might be due to the establishment of rural dairy projects. This may be further boosted by projects that may offer mentorship to the rural households so that they can start livestock production at a large scale.

### 3.12 Household infrastructure

#### i) Formal housing

Amongst the 28 477 households in Nkonkobe municipality, there are various types of houses which include very formal, formal, informal, traditional and other dwellings. The municipality is characterized by a largely rural settlement character. These settlements are clustered on ridges and along the roads with a variety of housing structures built out of mud brick, block and brick walls. Roofing varies from thatch to corrugated iron. In the two towns of Alice and Middle-drift, there are informal structures and back yard shacks behind larger houses built from brick and blocks (Statistics South Africa, 2001). Figure 9 below, shows the number of households by type of dwelling. The majority of the households in Nkonkobe municipality live in formal houses, while the second highest number live in traditional rural houses. Very few people live in informal houses and only 3248 people live in very formal houses. The dairy projects might be influencing the construction of formal houses in rural areas. If this were the case, it is most likely because the rural household income has increased due to wages from these dairy projects, resulting in households being able to afford to build formal houses.

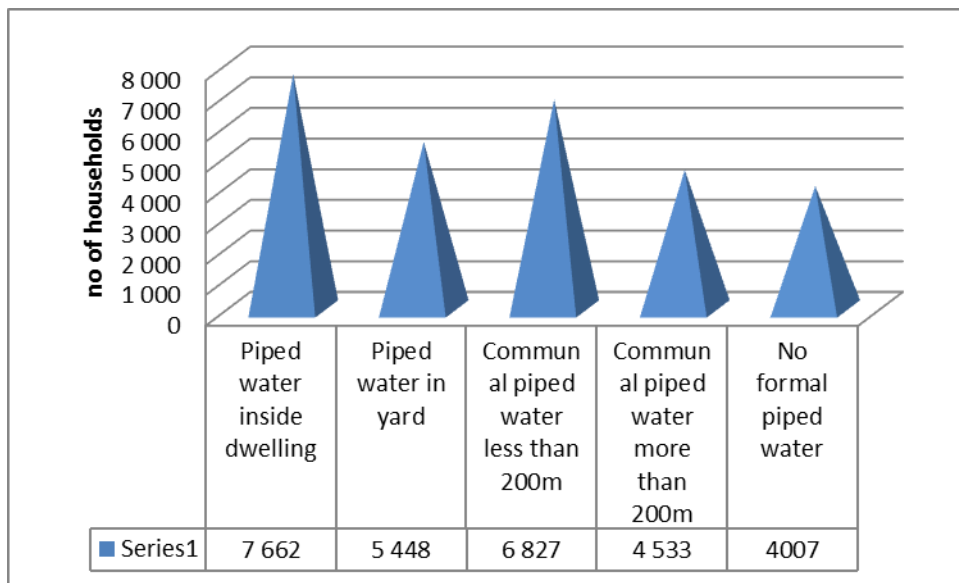


**Figure 9 Number of households by type of dwelling**

**Source: Global Insight (2009)**

### 3.13 Water infrastructure

The Nkonkobe municipality has also improved in terms of water infrastructure since 1996. The water infrastructure is divided into piped water inside dwelling, piped water in yards, communal piped water less than 200 metres away (within the RDP standard), communal piped water more than 200 metres away (Below RDP standard). Seventy percent of households have access to water within RDP standards. About 7662 of the households in Nkonkobe municipality have piped water inside their dwelling, 5448 households have access to piped water in their yard and 6827 households share a central communal piped water source, situated less than 200 metres from their dwelling. There are still areas that are without formal piped water though. There have also been huge strides made in ensuring that communities have access to education, health and sanitation. The improvement in access to infrastructure has positive implications for economic development. The establishment of dairy projects in rural areas might have also contributed towards the accessibility of clean water and availability of water infrastructure since dairy milking parlours require quality supplies of water.



**Figure 10 Number of household by level of access to water**

**Source: Global Insight (2009)**

Electricity connections in Nkonkobe municipality have shown great improvement. This is reflected in the estimates by global Insight (2009). Estimates suggest that 3 709 households have

access to Eskom electricity that they use only for lighting while 11 405 households have access to electricity that they use for lighting and other purposes. It is estimated that 13 363 out of 28 477 households have no access to electricity and use fire wood and paraffin as an alternative. These improvements in access to infrastructure have positive implications for economic development in the municipality. Access to electricity for example could be used as a catalyst to create rural based value adding business opportunities and to enable access to technology (computers and internet) in the rural areas. Increased access to telephones also makes it possible for communities to be accessible and to engage in various business activities facilitated by the municipality.

### **3.14 Governance in Nkonkobe municipalities**

Traditional leaders (headmen and sub-headmen) and the democratically elected councillors are the governing officials of Nkonkobe. The Administrative Areas (Alice and Middledrift) are divided into sub-units called wards. Each ward has a councillor who represents it in the local government. They form part of the District Council, where decisions are made. Mayors are the heads of town municipalities (Global Insight, in 2008).

### **3.15 Socio-economic activities in Nkonkobe**

According to Nkonkobe Municipality Draft Integrated Development Plan (2011), there are projects underway in the area, which involving different social groups. These aim to enhance the livelihoods of the people of the Eastern Cape communal areas. The projects focus on sectorial enterprises such as sewing, gardening, poultry, baking and stock improvement (Nkonkobe Municipality Draft Integrated Development Plan, 2011). They help communities in securing food and in improving the quality of stock. The different social groups identified are the unemployed, women, widows, out-of-school youth, farmers, pensioners, civil servants, orphans and the disabled and business people. These business people are involved in various activities such as building, carpentry, shops, shoe repairs, candle-making and beadwork (Nkonkobe Municipality Draft IDP, 2011). The community generally relies mostly on its own organisations such as churches, community schools, women's prayer groups, Farmers Unions, burial societies, Taxi Associations, and traditional leaders for social services (Perret, 1999).

### **3.16 Household sources of income**

Income diversification into non-farm activities has come to be recognised as typical practice among rural households (Obi, 2011). Davis and Pearce (2001) explained that sources of income in rural areas can be classified into three categories, namely, on-farm income, off-farm income and transfers. 'Only non-farm' refers to all the income associated with wage work or self-employment. Like many rural households, farmers in Nkonkobe municipality engage in a wide range of economic activities. Due to the high levels of poverty experienced in the municipality, most households rely on state social welfare grants as their main source of income. The establishment of dairy projects is very likely to influence the rural households around the dairy projects to undertake farm as a source of income. The assumption is that they have been getting information on how the dairy project is run and that they would be willing to practice what they have observed on a small scale. Furthermore, the presence of dairy projects is likely to encourage grain farmers around the dairy project to supply the project with grain for animal feed, triggering the households to pursue only farm livelihood strategy.

### **3.17 Conceptual framework of the study**

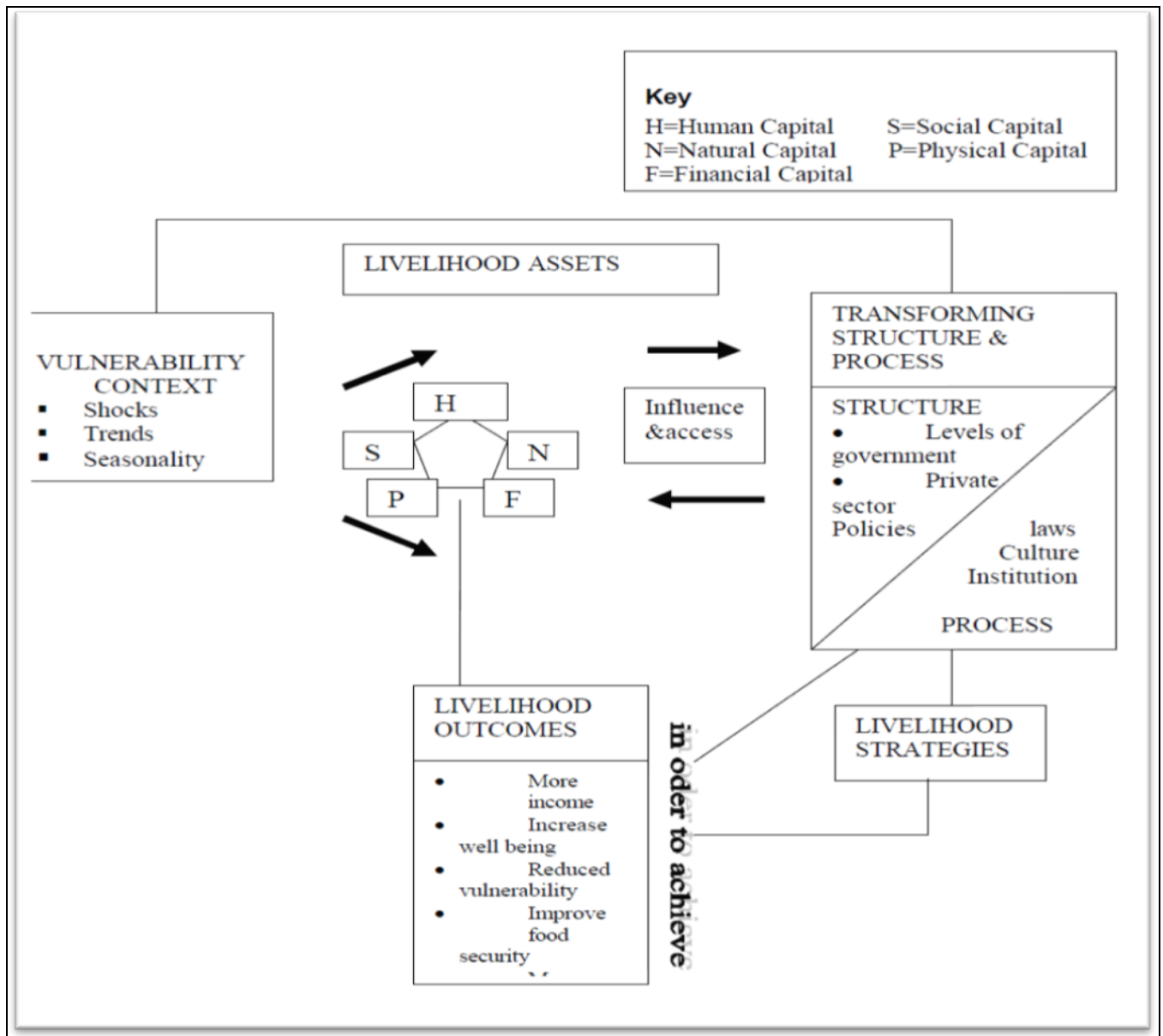
In order to study and understand the dynamics and complexities of human communities, as they build their livelihoods portfolios, this research focused on the livelihood income generating strategies of the rural households living around dairy projects. The institutions (structure/processes) lie between the households' actual potential and their aspirations. These can either make or unmake household assets. They can also define the range of livelihood income strategies at the disposal of households. Rural households' resource allocation decisions are fundamentally constrained by conditions of livelihood assets endowment or related socio-political and institutional factors (Berhanu *et al.*, 2007).

Conceptually, the framework draws on the livelihoods approach (Ellis, 2000). This framework focuses on the portfolios of households' economic activities and the results of this diversity of activity. The results are measured in income and other measures of well-being. This is further outlined on Figure 11 The framework above draws on the phenomenological approach, with the aim of understanding people. People are conceived, not primarily as biological organisms, but firstly and foremost as conscious, self-directing, symbolic human beings. This approach

emphasizes the ‘dis-analogy’ between social and natural phenomena, that all human beings are engaged in the process of making sense of their lives and worlds (Babbie and Mouton, 2003). The ability of individuals and households to combine a wide ranging portfolio of livelihood activities and kinds of resources is complex and dynamic (Chambers and Conway, 1998).

Livelihood outcomes are the goals to which people aspire, the results of pursuing their livelihood strategies, such as increased income, reduced vulnerability, increased well-being, improved food security, and more sustainable use of natural resources. Livelihoods outcomes are important because they help the analyst to understand the results of peoples’ livelihoods strategies in a particular context, why people pursue particular strategies and what their priorities are, and how people are likely to respond to new opportunities or constraints. Assets which people can rely upon play a crucial role in the livelihoods framework.

Those with more assets are more likely to have greater livelihood options with which to pursue their goals and reduce poverty. Traditionally, five categories of assets or capitals (i.e., human, social, natural, physical, and financial) are identified, although subsequent adaptations have added others.



**Figure 11 Conceptual framework of the study**

**Source: (DFID, 1999)**

Livelihood strategies are the combination of activities that people choose to undertake in order to achieve their livelihood goals. They include productive activities, investment strategies and reproductive choices. A major influence on people’s choice of livelihood strategies is their access to assets and the policies, institutions and processes that affect their ability to use these assets in order to achieve positive livelihood outcomes. Livelihoods approaches try to understand

the strategies pursued and the factors behind people's decisions, to re-enforce the positive aspects of these strategies and mitigate against constraints.

### **3.18 Research Method**

This section describes the processes and procedures employed in collecting the data, research design, sampling method, sampling frame, sampling size and methods that were used for analysis. The study was done in two leading dairy projects, namely, Fort Hare dairy and Middle Drift Project.

### **3.19 Research design**

The study used a case study approach complemented by an evaluative approach as the main research techniques. A case study technique, according to Hofstee (2006), is a research design approach that examines a single case in a tightly structured way, towards testing a hypothesis about the case itself as well as gaining principles that can be extrapolated to similar cases. In this study, a case study approach was used to capture detailed knowledge about rural livelihood portfolio available for diversification. This knowledge was based on evidence from communities that share boundaries with Alice and Middle Drift dairy projects.

The household was considered as the unit of analysis in this study. In rural traditional societies, the household is the primary decision making unit (Abbott, 1997). They can be treated as “black boxes”, which provides the information required. Each household has got its own head who may vary in age and gender; child or adult, male or female. The sampling frame considered in this research is all households in villages around Fort Hare and Middle Drift community dairy projects.

### **3.20 Research instrument**

A structured questionnaire with both closed and open-ended questions was designed and administered to households for primary data collection. The advantage of structured interviews is that they take place over a short period of time and are more specific (Yin, 1994). The questionnaire was designed in order to collect both qualitative and quantitative data.

The questionnaire was then administered to respondents through face-to-face interviews where the interviewer and the respondent interact with each other. The Face-to-face interview method

of administering the questionnaire was chosen because it has several advantages over other methods. According to Bless and Smith (2000), an interviewer administered interview is an important tool of data collection because it reduces omission of difficult questions by respondents. In addition, it reduces the problem of word or question misinterpretation (misunderstandings) by respondents and can be administered to farmers who can neither read nor write.

However, disadvantages of using these type of questions include the fact that they require the researcher to spend a lot of time generating a list or responses. If the list of responses is too long, the respondents may become confused or disinterested (Gates and McDaniel, 1997). The open questions give the respondent room to express his/her perception to sensitive issues freely.

### **3.21 Sampling procedure**

A Sample of 120 households was selected from a population of households in the villages around the dairy projects. Thus, the characteristics obtained from the sample reflect approximately the same characteristics as the overall population. A non-probability sampling method was applied in order to choose a sample size of 120 units. According to Bless and Smith (2000), in order to get reliable statistics, a sample should have at least 30 units to conduct reliable statistical analyses. A convenience sampling method was used because the total number of households in some of the villages sampled was not available.

A total number of 120 households were interviewed. Households were interviewed to understand the complexities of rural livelihoods strategies pursued in the midst of local government intervention programs like dairy projects. A gender-blind formula version of the household was adopted to provide information without gender biasness.

For the purposes of understanding households` livelihoods strategies, stratified (based on administrative areas) and randomly selected respondents from each administrative area in Nkonkobe municipality were asked about their major livelihood strategies using open-ended questions. Six villages within 10 km of the dairy project in rural areas of Middle-drift and Fort Hare dairy projects were stratified. The three villages selected from Middle-drift were Ann Show, Sweet home and Brilliant park village and the three from Fort Hare were Golf Course, Ncera and Ntselamenzi villages.

The Cross sectional data collection method was used in the research as part of the research design. The following table indicates the numbers of targeted households interviewed in Nkonkobe local municipality. Sample sizes were uniform across the administrative areas in the municipality due to the study area's location and its socio-economic heterogeneity. According to Parkin (2008), the uniformity in the sample sizes of areas would reduce the biasness in the results obtained.

**Table 1 Distribution of respondents interviewed**

<b>Alice Dairy Project</b>	<b>Middle drift</b>
20 households from Golf Course village	20 households from Ann Show village
20 households from Ncera village	20 households from Sweet home village
20 households from Ntselamenzi village	20 households from Brilliant park village

The aim of the stratified random sample is to reduce the potential for human bias in the selection of cases to be included in the sample. As a result, this stratified random sample method provides a sample that is highly representative of the population studied.

Relative to the simple random sample, the selection of units using a stratified procedure was the superior choice because it improved the potential for the units to be more evenly spread over the population and it ensured that no stratum was over-represented.

### **3.22 Data collection procedure**

Pre-testing, referred to as a pilot study, was done to avoid ambiguity and errors in the questions to be asked, get a sense of the answers expected and to make adjustments in the content of the questionnaire. This approach was advocated by (Reynolds and Dimantopoulos, 1998). Prior to the visit, the researcher notified the local authority about their intention to conduct a survey in the area. A meeting with the project managers and the headman was held at the headman's residence to explain the purpose of the survey. All the procedures and purposes behind the study were explained to the community. The interviewers explained who they were, the purpose of the

survey and the importance of their participation and co-operation during the interview to the respondents. The researcher together with extension officers from the Eastern Cape Provincial Department of Agriculture conducted the interviews.

Local extension officers from Alice and Middle Drift, who have a better understanding of the area's farming activities than the researcher also participated in the research. Interviews were conducted face to face with household heads in their homes. In the absence of the head, the spouse of the head or another family member who is directly involved in the farming activities and management of the household was interviewed. The main respondents provided most of the information, but were allowed to consult other household members where necessary. Two interviewers carried out each interview; one asked questions while the other filled in the questionnaires. The local extension officers and the researcher translated the questions into the local language of the area, isiXhosa, while conducting the interviews.

The data that was collected included the household variables, demographic data (age, sex, highest educational level attained, family size and income level), household perceptions of the dairy project, institutional variables available to the household, and livelihood portfolios pursued by rural households around the dairy projects.

### **3.23 Data analysis**

After collecting the data, the next step was the preparation of a codebook in order to assign numerical values to the answers obtained from the respondents. The data from the questionnaires was then given codes and transferred onto a spread sheet (Microsoft Excel, 2000). According to Kumar (1996), it is important that the information obtained should be in the language that the computer would assimilate when a computer was being used to analyse it. The second step was to use the descriptive statistics, specifically means and standard deviations (Microsoft Excel, 2000). Primary data collected from individual households around the two rural dairy projects through the interview schedule was analysed. Descriptive statistics such as measures of central tendency, frequency, percentages, and ranking were analysed with the use of Statistical Package for Social Science (SPSS). Multivariate statistical analyses (the multinomial logistic regression

model) were used to test hypotheses 3 whilst hypotheses 1 and 2 were analysed using descriptive statistics.

### **3.24 Approach applied**

This section demonstrates the methods of analyses applied to achieve objective number three of the study, namely ‘To identify determinant factors influencing rural households surrounding dairy projects in their choice and pursuit of certain livelihood strategies that could improve their welfare.’ A three-stage approach was applied. In stage one, major sources of income in rural areas around dairy projects were identified. In stage two, superior household’s livelihood strategies were identified by matching livelihood strategy with welfare strata of households, defined in terms of adult equivalent per capita income. This method focuses on household participation in different income earning activities of the rural economy (Barrett *et al.*, 2005; Damite and Negatu, 2004). The identification of superior livelihood strategies helps the policy makers and development practitioners to target them and make a meaningful difference in the lives of poor households in rural areas. In the last stage, a multinomial logistic regression equation (Green, 2003) is fitted to identify factors that determine households’ entry into different livelihood strategies. Finally, stage three analysed livelihood strategies in conjunction with important socio-economic characteristics of rural households around dairy projects.

In this study, households obtained income from various sources and therefore a standardized questionnaire was designed. It was used to capture data on rural household composition, socio-economic characteristics, food consumption and income levels. Data gathered also included details of participation in different farm and non-farm activities. The sources of income include income from wages, salaries and commissions; income from their own businesses; income from sales of farm produce and services, as well as from rents and interest; and income from remittances, pensions, and grants. These income sources were matched with certain broader activities or livelihood strategies. The following major livelihood strategies were identified in the process – only farm, non-farm, non-labour (off-farm), on-farm and non-farm, non-farm and non-labour and on-farm plus non-farm and non-labour (Stifel, 2010; Corral & Reardon, 2001). Thereafter, each livelihood strategy was further categorised into wage and non-wage based

activities. For example, a household which diversified its income sources into farm and non-farm sources could take up wage and non-wage activities. Wage activities refer to employment in non-farm salaried activities or employment on farms other than family farms. Non-wage activities, on the other hand, could refer to a wide variety of self-employment opportunities such as running one's own business (weaving, etc.), sales of farm produce and services, and rents and interests.

Welfare measurement is required for ordinal ranking of livelihood strategies and to do a comparative analysis of livelihood strategies that reduce poverty and economic pressure on households. Two approaches, namely, per capita income and per capita expenditure, were used to classify livelihood strategies into high or low-income earning activities.

### 3.25 Theoretical and conceptual framework

A decision regarding whether or not to choose a livelihood strategy was assumed, in this study, to fall under the general framework of utility and profit maximisation. With reference to utility measurement, O'Sullivan, Sheffrin and Perez (2006) explained that it is difficult to measure utility directly. It has therefore been assumed in this study that households make livelihood strategy choices depending on which of the options best maximizes their utility. That is, subject to household socio-economic and institutional factors, decisions to choose the non-farm, only farm, farm + non-farm, non-labour livelihood portfolios signify the direction which maximizes their utility. Based on this assumption, multinomial logistic regression was used to relate the decisions to choose livelihood portfolio strategies and the household socio-economic and institutional factors that influence these choices.

Considering the case of a rational household (designated  $i$ ), that seeks to maximise the present value of expected benefits of production over a specified time, and that must choose among a set of livelihood adaptation options including  $j$ . Household  $i$  would rationally be expected to use  $j$  livelihood adaptation option if the perceived benefit from option  $j$  is greater than the utility from switching to other options (say,  $k$ ). This is depicted, as suggested by Gbetibouo, Hassan and Ringler (2010) in equation 3.1

$$U_{ij} (\beta_j X_i + \varepsilon_j) > U_{ik} (\beta_k X_i + \varepsilon_k), k \neq j \dots\dots\dots (3.1)$$

Where;

$U_{ij}$  and  $U_{ik}$  are the perceived utility by household  $i$  of livelihoods adaptation options  $j$  and  $k$  respectively

$X_i$  is the vector of explanatory variables that influence the choice of adaptation option

$\beta_j$  and  $\beta_k$  are the parameters to be estimated

$\varepsilon_j$  and  $\varepsilon_k$  are error terms

Based on the revealed preference assumption that the household livelihood option that generates net benefits, and does not choose a livelihood option otherwise, the study relates the observable discrete choice of practice to the unobservable (latent) continuous net benefit variables as

$Y_{ij} = 1$  if  $U_{ij} > 0$  and  $Y_{ij} = 0$  if  $U_{ij} < 0$  (Gbetibouo, Hassan and Ringler, 2010). Based on this formula,  $Y$  is a dichotomous dependent variable that takes the value of 1 when the household, chooses a livelihood option in question, and 0 in other scenarios. Effectively, the probability that household  $i$  will choose a livelihood strategy  $j$  from among the set of livelihood options shall be defined as follows (Gbetibouo, Hassan and Ringler, 2010):

$$\begin{aligned} P(Y = 1/X) &= P(U_{ij} > U_{ik}/X) \dots\dots\dots(3.2) \\ &= P(\beta_j^1 X_i + \varepsilon_j - \beta_k^1 X_i + \varepsilon_k > 0/X) \\ &= P(\beta_j^1 - \beta_k^1) X_i + \varepsilon_j - \varepsilon_k > 0/X \\ &= P(\beta^* X_i + \varepsilon^* > 0/X) = F(\beta^* X_i), \end{aligned}$$

Where;

$\varepsilon^*$  is a random disturbance term

$\beta^*$  is are vectors of unknown parameters that can be interpreted as the net influence of the vector of explanatory variables influencing the choice

$F(\beta^* X_i)$  is the cumulative distribution of  $\varepsilon^*$  evaluated at  $\beta^* X_i$

The utility derived from any alternative livelihood choices depends on the attributes of the livelihood portfolio and other socio-economic and agro-economic factors affecting households' decisions. Choices made among the alternative livelihood strategies will be a function of the probability that the utility associated with a particular option (j) is higher than that associated with another alternative livelihood option.

### 3.26 Empirical model for the study

In this study, households' livelihood choices amongst four strategies were estimated within the multinomial logistic framework (Gujarati and Potter, 2009). The multinomial logistic regression model was used to analyse the factors affecting households' choices of livelihood strategies (farming, non-farm, non-labour and farming + non-farming). The model has been commonly applied to analyse discrete choice data (Farsi et al., 2007). It is suitable because it allows the analysis of decisions across more than two types of livelihood strategies. Furthermore, the multinomial logistic regression model can be used to predict a dependent variable, based on continuous and/or categorical independent variables, where the dependent variable takes more than two forms (Hill, Griffiths and Judge, 2001).

As mentioned the study followed a multinomial logistic model specification by Gbetibouo, Hassan and Ringler (2010), and Green (2003), which has been commonly applied to analyse discrete choice data. The response variable includes four distinct livelihood alternatives: farming, non-farm, non-labour and farming plus non-farm. The probability that household *i* with characteristics *X* choose livelihood strategy portfolio option *J* is therefore specified in the equations below.

The probability that a household *i* adopts (j) livelihood strategies is given by:

$$P_{ij} = \text{prob} (Y=1) \frac{e^{x_i \beta_j}}{1 + \sum_{j=1}^N e^{x_i \beta_j}} \quad j \dots 1, 2, 3 \dots N \dots \dots \dots (3.3)$$

$Y_i$  is the dependent variable representing the livelihood strategy chosen by a household and takes the values 1, 2, or 3 if the household chooses non-farm, non-labour or farming plus non-farm alternatives respectively. Farming is used as the reference category.

$\beta$  is the vector of estimated coefficients. The results of the multinomial logistic model are interpreted in terms of odds ratios; the ratios of the probability of choosing one outcome category over the reference category. These ratios are defined as:

$$\ln (P_{ij}/P_{ik}) = X_i(\beta_j - \beta_k) = X_i\beta_j \text{ if } k=1$$

A positive parameter indicates that the relative probability of choosing other livelihood strategies over farming increases relative to the probability of choosing farming over other livelihood strategies (non-farm, non-labour and farm plus non-farm).

Greene (2003) noted that in order to avoid bias and maintain consistent parameter estimates of the multinomial logistic model such as the one shown in equation 3.3, given the true reality that a household can choose more than two livelihood strategies, the assumption of the independence of irrelevant alternatives must hold.

By differentiating equation 3.3 with respect to each predictor variable, the marginal effects of these variables may also be estimated as shown below in equation 3.4.

$$\frac{\partial P_{ji}}{\partial q_i} = (\beta_j - \sum_j^N = 1^{P_{ji}\beta_j})P_{ji} \dots\dots\dots (3.4)$$

**3.27 Independent variables**

The explanatory variables that were fitted in the multinomial logistic regression model are defined in Table 2.

**Table 2 Model explanatory variables applied in the analysis**

<b>Variable</b>	<b>Description and measurement</b>	<b>Type of variable</b>	<b>Anticipated <math>\beta</math> sign</b>
<b>Age</b>	Age of household head (actual years). Age of household head can be a proxy to experience and was hypothesized to positively influence household livelihood strategy.	Continuous	+/-
<b>Gender</b>	Gender of household head. This was dichotomous variable (1=male; 0=female), which influenced the choice of household livelihood strategy.	Categorical	+/-
<b>Education</b>	Education of household head in years. No education=1. primary, secondary, tertiary and university education=2, 3,4 and 5 respectively.	Categorical	+/-
<b>Household -size</b>	Number of household members expressed in adult members	Continuous	+/-
<b>Land size</b>	Estimate of size of farming area (Actual size in hectares)	Continuous	+/-
<b>Extension</b>	Whether received or not: 1 = yes, 0 = no	categorical	+
<b>Credit access</b>	Dummy variable, access to formal credit (1), No access (0)	Categorical	+
<b>Market distance</b>	Actual distance from village to the nearest market place (km).	continuous	+/-

### **3.28 Household age**

This variable is expressed as the actual age of the household head in years. Previous studies, including Bembridge (1984), have established that the age variable is a key determinant of behavioural patterns of household and community members. With regard to age, Rao *et al.*, (2004), observed a negative relationship between age and willingness to adopt non-farm livelihood sources. Lack of agricultural land may be the factor that most influences young households in their consideration of other livelihood sources. Younger farmers are expected to be more technically constrained than older farmers, who are perceived to have acquired experience of farming and farming resources. This is supported by an observation by Fraser *et al.* (2003) that older farmers are likely to have more resources at their disposal. Depending on the nature of available non-farm activities, Kohlin and Parks (2001) further argued that older people may lack both physical strength and necessary time to engage in most non-farm activities. A negative correlation with age was therefore expected for this variable.

### **3.29 Household gender**

Several studies suggested that female headed households are often less likely to participate in non-farm activities, mainly because of culture, social mobility limitations and differential ownership/access to assets (Adugna, 2005). In contrast, literature also suggests that women in general may be more willing to participate in common pool property resources than men, and may be more involved in gathering activities than men (Folbre, 1994; Grossman, 1996). Considering this context, either a positive or a negative correlation was expected for this variable in the study.

### **3.30 Household education**

Studies conducted in several developing countries have confirmed the importance of education in the decision-making process, as well as the resultant implications for socio-economic development and human capital production (Bembridge, 1984; Mushunje, 2005). Barrett *et al.* (2001) noted that education was one of the most important determinants of non-farm earnings, especially in more remunerative and skilled employment in rural Africa. Contrary to this, Berehanu (2007) reported a negative association between education and diversification into non-

farm activities. Comparable conclusions were also reported by Muchapondwa (2003), who noted that the more educated households become, the more unlikely they are to participate in non-farm activities. Five categories which include (a) uneducated households, (b) households educated up-to primary level, (c) households educated up to secondary level, (d) households educated up-to tertiary level and (e) households educated up-to university level, were identified in this research. Either a positive or a negative association was therefore conjectured for this variable in the study.

### **3.31 Household size**

An Increase in household size might increase the dependency ratio, which in turn affects savings and investment. Conversely, a larger household may mean increased labour availability, which enhances farm production under the kind of labour-intensive farming livelihood strategies that prevail in communal agriculture. Therefore, it is possible for either positive or negative relationships to exist between household size and the pursuit of only farm livelihood strategies. This is because farming activities are labour intensive (Kabubo-Mariara, 2008).

### **3.32 Access to extension**

This variable measures whether farmers were in contact with extension officers more than twice a month. Extension services are an important source of farming information and advice for smallholder farmers (Enki, Belay and Dadi, 2001). Because of this, it can be hypothesized that on-farm livelihood strategy and extension service utilization correlate with each other; the more extension contact the smallholder has, the better the chances of adopting farming related activities as their livelihood strategy. Samuel (2003) reports a positive association between frequency of extension services and diversification into non-farm activities. Similar earlier conclusions were inferred by Gaspert *et al.*, (1999) who suggest that access to institutions may enhance awareness of the potential gains that could be derived from a dairy project. A positive association was, therefore, expected for this variable.

### **3.33 Market access**

This variable measures the distance to the point of sale for farm output, probably a market centre where buyers congregate. The greater the distance to the market place, the higher the transport costs. Farmers who are located long distances from the point of sale are likely to lack market access if they do not possess the means to transport their produce. It can therefore be hypothesized that there is either a positive or a negative correlation between market access and livelihood strategy pursued.

### **3.34 Land size**

This variable refers to the size of land in hectares. An increase in land size may enhance production if the land is effectively utilized. At the same time, land may be available but not be being effectively utilized. Effective utilization will entail application of appropriate farm practices that will lead to higher physical output than otherwise would be the case. Several studies reveal that the larger the land size, the less likely it is that owners will be willing to diversify into other non-farm activities (Lanjouw and Lanjouw, 1995; Berehanu 2007), provided that owners are getting meaningful returns. On the other hand, several studies suggest a positive association based on the complementary nature of the farming system (Fisher, 2004), notably agricultural compost (Varughese and Ostrom, 2001; Narain *et al.* 2005). Either a positive or a negative association was therefore considered for this variable.

### **3.35 Chapter conclusion**

The chapter highlighted the socio economic status of the study area and the situational analysis of the socio-economic scenario of Nkonkobe Municipality. The socio-economic situation in the Nkonkobe rural areas where most of the poor are located is worsening despite attempts by the national and local government to improve the situation and address the inequalities of the past through PGDP, IDPs, ASGISA and other developmental policies. The chapter also gave the description of the study area, methodology and also analyses the theoretical framework and analytical tools used to analyse data.

## **CHAPTER 4: RESULTS AND DISCUSSIONS**

### **4.1 Introduction**

Can dairy projects provide livelihood sources in poverty stricken rural areas? In order to answer this question, Chapter 4 explores the results of livelihood strategies of households who live around rural dairy projects. In this chapter, the descriptive and empirical results of the study are presented. The empirical results are presented and discussed later in the chapter. The empirical results are used to interpret the descriptive results of the research study.

### **4.2 Descriptive statistics**

Descriptive statistics are presented for the whole sample chosen of rural households in Nkonkobe municipality. The socio-economic factors affecting these households in the case study are discussed and results on demographic data and household income are presented first in the form of descriptive statistics, where tables, graphs and charts are used. Major constraints faced by respondents were also noted, with the objective being to understand the potential barriers that communities faces as they undertake various livelihood strategies. Using graphs, the study also explored the distribution of various household characteristics with respect to livelihood choices.

### **4.3 Demographic characteristics of sampled households**

In this section, household head's demographic characteristics such as gender, age, marital status, household size, access to credit and highest educational levels attained are discussed. Makhura (2001) outlines the importance of knowing the demographic aspects of the household because the main household activities are coordinated by the household head, and the head's decisions are most likely to be influenced by such demographic characteristics. Choices related to adoption of superior livelihood strategies are also influenced by household demographic characteristic, hence it is very important to analyse this factor before deducing conclusions.

#### 4.4 Household size

Household size refers to the number of people living together in a household, including non-family members (Perett, 1999). For this study, household size was a total count of all the people living together in a household including non-family members. All persons who spent most of their time living and sharing food with a particular household were treated as members of that unit. Household size plays an important role as a source of labour. This is offset by the fact that household size also has an impact on household expenditures per month. Average household size is shown by the Table 3 below.

**Table 3 Descriptive statistics table of household characteristics**

	HSH size	Education	Age	Gender	Extension services	Market access	Land Size
N	120	120	120	120	120	120	120
1. Mean	6.0	3.0	45.0	.78	.58	.79	1.90
2. Std. Deviation	.764	.794	9.174	.318	.347	.463	.490
3. Skewness	.364	.275	.841	-1.225	1.034	.735	.429
4. Minimum	2	1	25	0	0	0	.5
5. Maximum	10	5	75	1	1	1	2

The asymmetry of distribution was both positively and negatively skewed, as shown in Table 3 Household size, education, age, extension services, market access and land size were positively skewed, while gender was negatively skewed. Most of the characteristics had skewness values below 1, with the exception of extension; this suggests that the distribution did not differ significantly from a normal symmetric distribution. The descriptive results from Table 3 show the mean household size of 6 skewing towards the maximum household size of 10 from the households sampled suggesting that families with large household size would have enough

labour to produce grain needed by the dairy project for animal feed. The household size descriptive results argumentatively support the research of Kabubo-Mariara (2008), namely, that household size has a positive correlation with households pursuing only farm livelihood strategies because farming activities are labour intensive.

#### **4.5 Household gender**

A descriptive result (Table 3) of gender for the households in communities around dairy projects shows a negative skew towards males. The male households might have migrated to urban areas leaving the female households dependent on dairy project livelihood strategies such as selling their farm produce to the dairy projects and being employed as casual workers on the farms. This skewness might be an indication that one of the objectives of the dairy project, the empowerment of women, is being met. Literature also suggests that women in general may be more willing to participate in common pool property resources than men, and may be more involved in gathering activities than men (Folbre, 1994; Grossman, 1996).

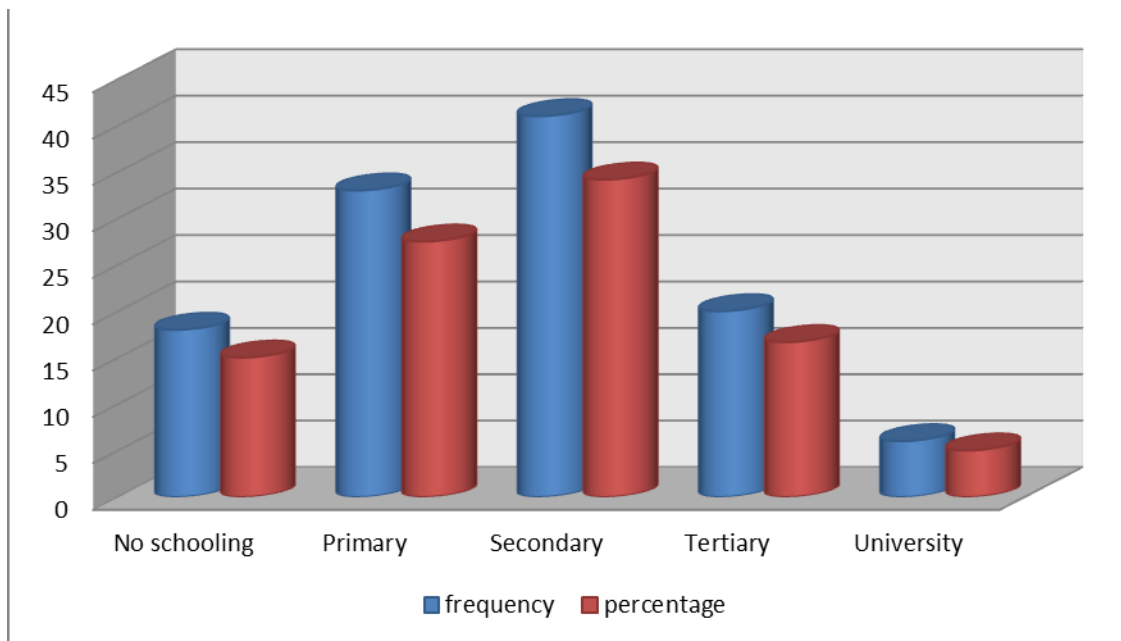
#### **4.6 Age of the household**

The descriptive results from this study illustrated on Table 3 shows that the age of household heads ranged from 25 to 75 years, with an average household-head age of 45 years. The age of the household head in this study has a positive skew towards the economically active group. This might show the tendency of healthy, strong households to depend on dairy linked livelihood strategies that require more physical energy. Middle aged, experienced and economically active people are stronger than the elderly ones and can perform tougher jobs in the field, and more easily pursue various high return livelihood portfolios available. In a related study, Bashir et al. (2012) found that an increase of a year in the age of household head decreases the chances of a household pursuing non-farm livelihood strategy.

#### **4.7 Education level of households**

Economic benefits of schooling include the potential to pursue high return or superior livelihood portfolios that generate income through self-employment. These high return portfolios commonly use skills learned in school. Improved skill and technical know-how also improves household's productivity in the field. The education levels of the household heads and the

highest education level in a household were assessed for this sample and presented. The mean educational level was 3, implying that, on average; respondents were educated up to secondary level. There is a likelihood that some households depend more on dairy project related livelihood strategies because they are not educated enough for them to migrate to urban areas to compete for other high paying jobs that require specialised skills and training. The percentages and the frequencies relating to education levels of household heads are presented in Figure 12.



**Figure 12 Education of household head**

#### **4.8 Access to extension**

The descriptive results illustrated in Table 3 showed the mean skewing towards access to agricultural extension. Households with access to extension are more likely to depend on dairy project for their livelihood because they might have acquired knowledge and training on farm production and livestock production. Similar earlier conclusions were inferred by Gaspert *et al.*, (1999) who suggest that access to institutions may enhance awareness of the potential gains from dairy projects.

#### **4.9 Access to market**

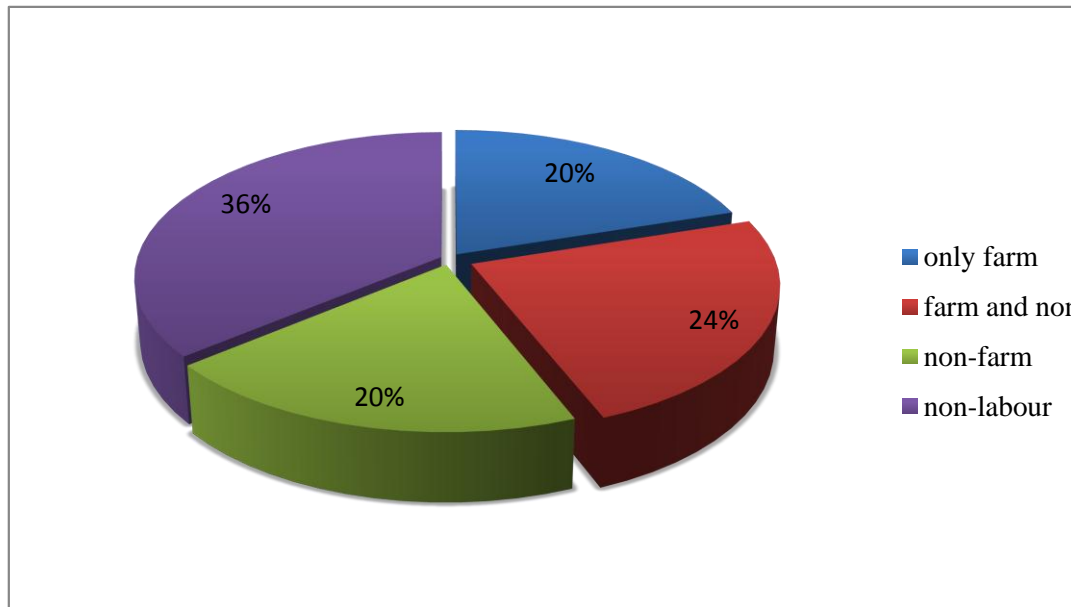
A positive skewed market access shown by descriptive analysis might suggest that the households living around dairy projects have access to market for their agricultural products that can be used as animal feeds. This may have increased the probability of the households to choosing farm related livelihood strategies because of available good market for farm products.

#### **4.10 Household land size**

The Table 3 showed an average land size of 2 hectares which is the maximum land size that the households in the research study have. This suggests the likelihood of households around dairy projects maximizing the use of their land because of the available rural market for agricultural products. Several studies reveal that the larger the land size, the less likely it is that the owner be willing to diversify into other non-farm activities (Lanjouw and Lanjouw, 1995; Berehanu 2007). This holds true provided that owners are getting meaningful returns.

#### **4.11 Distribution of livelihood strategies of the sampled households**

Chambers and Conway (1992) define livelihood as the capability, assets and activities required for a means of living. This study considers this definition, specifically looking at livelihood activities deemed critical for a means of living at the household level. This section focuses on reported livelihood strategies from the study area. Livelihood portfolios undertaken were investigated against a null hypothesis that on-farm, non-farm and non-labour activities and combinations of these are key livelihood strategies undertaken by households in communities around dairy projects. Figure 13 below, summaries the descriptive results of livelihood strategies undertaken by households who live in villages around rural dairy projects. The results agreed with conclusion of the study by Bryceson (2002) and Francis (2000) showing that rural people of Africa are engaging in a multiplex of livelihood strategies to increase food and income, and safeguard against risks and shocks. With regard to the livelihood portfolios reported by residents from the selected villages, four categories were created. These are presented in the pie graph below.



**Figure 13 Categories of livelihood strategies in the study**

**(a) Farming portfolio**

Farming portfolio represents an aggregate of choices undertaken by households in the study to spread risk. This includes households involved in: (i) field crop production of mainly grain crops like maize; (ii) horticulture; and (iii) animal production of mainly cattle, goats, sheep and poultry. The results presented in Figure 13 shows that 20 percent of the interviewed households in the study adopt only farm activities as livelihood strategies. This differs from Latin America, where several studies from Bolivia observed that, although there is a significant share of total household income from non-agricultural activities, agricultural production was still the most important source of income (Comisión Europea, 2000; Jimenez and Lizarraga 2003). The availability of dairy project in rural communities has increased the probability of rural households around them adopting the farming of grain crops. This is drawn from the fact that households indicated that dairy projects in need of grain for feeding cattle provided good market for the grain. Again, there is evidence that the households living around the dairy projects have increased in their interest in livestock production due to the access they have to the male calves sold by the dairy projects. Again the dairy projects offered mentorship in dairy farming, increasing the number of rural households around the dairy projects who considered small scale dairy farming as a livelihood strategy.

### **(b) Non-farm portfolio**

A non-farm portfolio strategy is one where all the generated income is associated with wage work or self-employment, this category includes households taking dairy project employment and those who are self-employed. From the survey, 20 percent of the 120 households interviewed chose this livelihood portfolio as a way of life. The presence of dairy projects in the rural areas has increased the number of households around dairy project taking the employment offered by the dairy project. From the study, 16 percent of the respondents indicated that they were employed by the dairy project. They were involved in various activities like herding dairy cows, irrigating and managing pastures, milking cows as well as administrative and managerial duties.

### **(c) Farm and non-farm portfolio:**

Farm and non-farm portfolios are the aggregate of choices by households to generate income from activities including: (i) employment in farm related activity or on other farms; and (ii) households mixing self-employment and farming activities. From this study, 24 percent of the households interviewed indicated that they combined farm and non-farm livelihood portfolios as a source of income generating strategies. The availability of the dairy project in the rural areas is more likely to increase the probability of households in communities around the dairy project widening their livelihood strategies and moving away from relying on farming alone. Some respondents cited that they sold their retail products like clothes to the dairy workers.

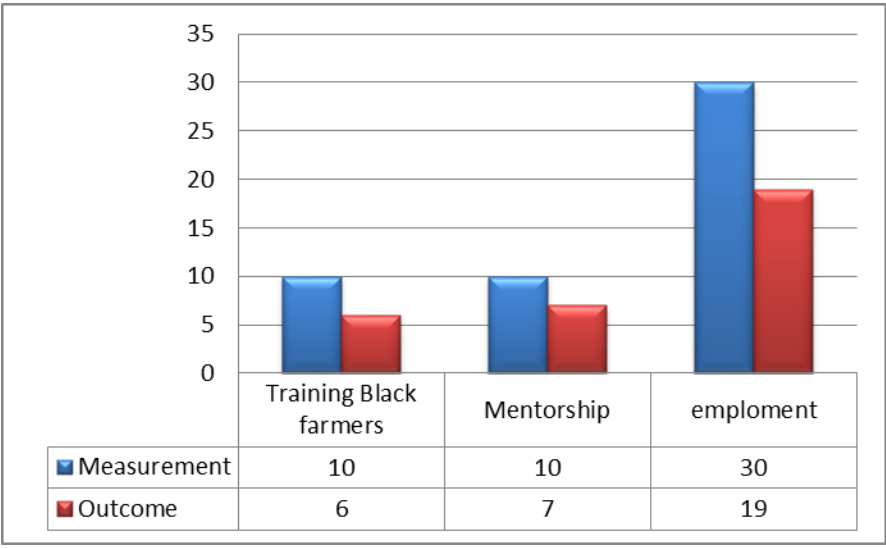
### **(d) Non-labour portfolio**

According to Carletto *et al.*, (undated), this category refers to both private and public transfers received by households as non-labour income, both in cash or in-kind. Private transfers in this category primarily refer to remittances, but can also include benefits from private organizations and/or associations as well as gifts and contributions not associated with the performance of a job or the provision of a service. The study shows that 34 percent of interviewed households around dairy projects consider social grants a livelihood source. The study shows that the main beneficiaries of the non-labour portfolio are the old aged households with members who are no longer physically active enough to take up dairy project as their available livelihood strategy.

#### **4.12 Projected objectives of rural dairy projects and deviations**

The research also explores the vision, mission and main objectives of establishing rural dairy projects in rural communities of the Eastern Cape. The responses from dairy project managers established the following vision of dairy projects: ‘Creating Profitable Sustainable Black Empowered Agri-Business’. This vision was supported by the following mission statements: ‘Driving the transformation process of white owned agribusiness through the selection, training and mentoring of black farmers through the process of long term partnerships; Transforming latent community assets into profitable businesses through long term joint ventures bringing upliftment, poverty relief and job creation and Growing and empowering businesses through investing and sharing’. The outlined mission would be met if the following outlined rural dairy project set objectives were met. The rural dairy project objectives and the expected measurement of these objectives are stated below.

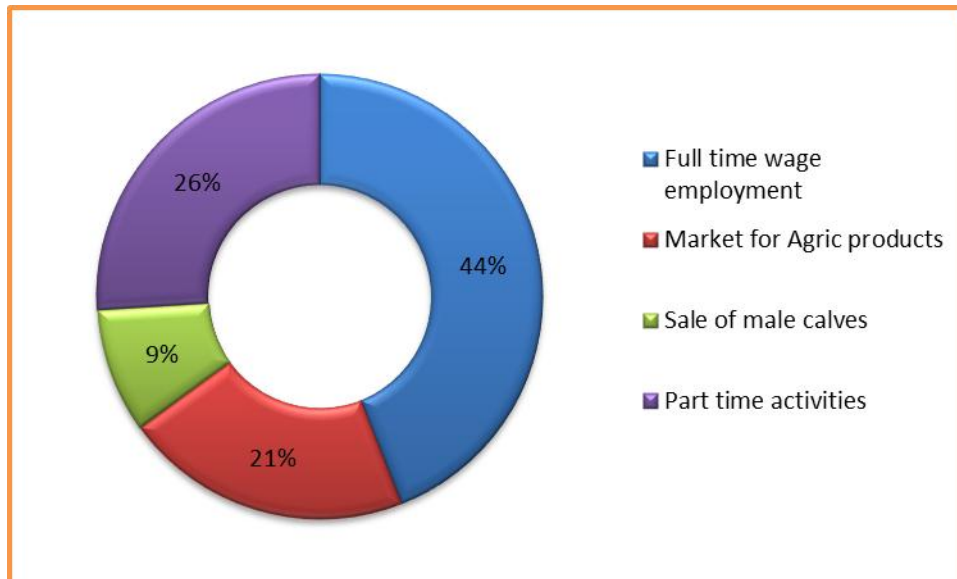
- Selection and training of highly talented black farmers through a partnership with the University of Fort Hare and other academic institutions in order to produce 10 experienced black dairy farm managers and owners per annum.
- Experiential training with highly successful farmers, insuring proper skills transfer (Mentorship) to capacitate black communities as trustees, directors and shareholder.
- Sustainable community development through the provision of capital and expertise.
- Employing 30 people per dairy project.



**Figure 14 Dairy project set objectives and the outcome**

The results presented from Figure 14 show that the dairy projects have set a measure of employing 30 people while in actual terms 19 are currently employed by dairy projects. The managers of dairy projects indicated that they had trained 6 black farmers from the various institutions, allowing them to do their field practical at the farm. This is a slight deviation from the set goal of training 10 farmers. This shows a great level of achievement by dairy project in producing skilled livestock farmers who are likely going to depend on dairy project related livelihood strategies. Furthermore, the outcome shows that the dairy projects are mentoring 7 black farmers per year. This is approaching the set target of 10 dairy farmers to be equipped with dairy skills so that they could practise dairy farming on their own. The mentorship program is likely to influence the rural households in communities around dairy projects to undertake dairy related livelihood strategies in order to improve their welfare.

#### 4.13 Rural dairy project livelihood pathways



**Figure 15 Dairy project set objectives and outcome**

The results of the study show that 44 percent of households benefiting from dairy project reported that they were employed on full time basis and were wage earners employed by dairy projects to perform activities such as feeding dairy cows, milking dairy cows, administration purposed at the dairy project and irrigating and farming grazing pastures for dairy cows. Households employed on a full time basis find it difficult to diversify their livelihood survival strategies, because of reasons like shortage of time and also the need to take time to rest. Rural households around the dairy project boundaries found the farming of agricultural products a livelihood strategy. Their enterprises were linked to the dairy project activities through marketing of their products like maize grain and soybeans to the dairy projects as fodder for dairy cows. About 9 percent of the households who had their livelihood activities linked to dairy projects reported that they purchased male calves from dairy projects and raise them for beef enterprises. Not only full time wage employment is offered by dairy projects. About 26 percentage of households indicated that they were employed on part time, casual bases in activities like construction, repairing of project fence and fixing electricity infrastructure.

The results show rural livelihood options available to households in communities around rural dairy projects. The motivation of the study was the conflicting conclusions that surround the practical potential of dairy projects to offer livelihood options to rural households around them. Based on household survey data obtained and analysed, the results suggest that dairy projects can be trusted as a reliable and sustainable livelihood sources due to the high returns achieved from the various livelihood portfolios they offer. The results complement with findings by Zitsanza (2001) that acknowledge the role dairy projects play in the development of the Zimbabwean economy through their contribution to the overall agricultural economic growth, households' income generation, and food security. This also is supported by Scoones, (2002) who acknowledge the role of dairy projects as safety nets, income sources, coping strategies and pathways out of poverty for the rural poor (Scoones, 2002). Respondents from this study noted the significant potential of rural dairy project activities to complement on-farm livelihood options chosen since households growing grain crops find market for their product at the dairy project.

#### **4.14 Ranking of livelihood strategies chosen according to adult equivalence per capita income**

Superior household's livelihood strategies were identified by matching livelihood strategies with welfare strata of households, defined in terms of adult equivalent per capita income. This method focuses on household participation in different income earning activities of the rural economy (Barrett et al., 2005; Damite and Negatu, 2004). Welfare measurement is required for ordinal ranking of livelihood strategies and to do a comparative analysis of livelihood strategies that reduce poverty and economic pressure on households. The identification of superior livelihood strategies helps the policy makers and development practitioners to target them, and to make a meaningful difference in the lives of poor households in rural areas.

Various scales are used by statistical agencies, many of which are proposed in the literature as a means for measuring the adult equivalent per capita income. The first equivalence scale that appeared in the literature was the Oxford scale, later named the OECD scale of 1982. This scale and all subsequent scales give a weight of 1 to the first adult, usual the head of the household, a

lesser weight to other adults (usually the head's spouse or some other adult above 14 years of age) and an even less significant weighting to children. The weights used in the Oxford scale which this research also adopted are presented in Table 4 below.

**Table 4 Oxford scale to measure the adult equivalent per capita income**

Member	coefficient
Head of household	1
Other adults	0.7
Children <15	0.5

#### 4.15 Comparative analysis of high returning livelihood strategies

The Table 5 gives the comparative analysis of the per capita adult equivalent income for households living around dairy projects undertaking various livelihood strategies.

**Table 5 Comparative analysis of livelihood strategies**

Livelihood strategy	Average household income/mth	Average household size		Per capita Adult equivalent income	Frequency in the survey	% of total household
		Adults >=15	Children <15			
Non-farm	R18 660	2	3	R5 831.3	24	20
Only farm	R14 350	3	5	R2 928.6	24	20
Non-labour	R1 560	2	4	R 421.6	43	36
Farm+ non-farm	R16 440	3	3	R4 215.3	29	24

Table 5, clearly shows that non-farm livelihood portfolios produce a high per capita income, that is, R5831.3 per adult equivalent per month. It is noticeable that only 20 percent of the total

interviewed households undertake non-farm as a livelihood strategy. It is likely that the households that depend on dairy wages and other non-farm activities are ranked better than other households undertaking other livelihood strategies. On the basis of the adult equivalence per capita income approach, this study has found an increase in household per capita income associated with their involvement in non-farm activities. Supported by studies done in African countries by Stifel (2010) and Abdulai & Crole Rees (2001), this study has found that rural households with the potential to undertake non-farm activities are likely to be better off than those that depend on farm activities (farm and non-labour) alone, or take up non-farm activities as their less important sources of livelihood.

Despite the positive relationship between non-farm activities and high per capita adult equivalent income, this study has found that not many households have benefited from non-farm activities in rural areas. This is consistent with the results of studies done by Stifel (2010) and Brown *et al.* (2006). Similar comparable observations were made by Carswell (2000), who notes that contributions made by non-farm livelihoods in African rural areas, have often been neglected by policy makers who have chosen to concentrate on agriculture.

About 36 percent of the households from the villages around dairy projects in this study undertake non labour livelihood portfolios such as government grants, pensions and remittances even though these are the least chosen livelihood strategies. This might show that the presence of dairy projects in rural areas does not automatically stop all the households from undertaking non-labour livelihood strategy. Available literature justifies the rationality behind this seemingly poor choice that poor households make. The choice seems to contradict the well-known theory of comparative advantage. This theory postulates that households' take up activities (strategies) that give superior returns. The literature argues in support of the economic theory that households allocate asset endowments in a manner that equates marginal returns across activities accessible to them. Poor households are forced to stick to low-return activities because of entry barriers they face to high-return strategies. According to Brown *et al.* (2006), in the presence of both high- and low-income strategies, households adopt the latter only when there are barriers to adopting the former.

The farm plus non-farm livelihood strategy has shown that it also offers better per capita adult equivalent income (R4 215.3/month) than households depending mainly on farming only (R2 928.6). These results outline the importance of the rural households' ability to mix their farming activities with activities associated with the dairy projects. This is to boost their income and to spread risks, a better approach than relying on farming livelihood strategies alone.

#### **4.16 Factors influencing households' choice of livelihood strategy**

The multinomial logistic regression model was used to test the hypotheses that household characteristics and socio-economic variables influence households to undertake certain livelihood strategies that improve household welfare or which have the potential to improve household welfare and income. Table 6 analyses livelihood strategies of households living around rural dairy projects in conjunction with important socio-economic characteristics of rural households. This is done to give some insight into the factors that influence households to enter into particular livelihood strategies.

There are a number of variables identified with the potential to affect rural households choice of a certain livelihood strategy. These include the gender of household head, the education level of household heads, the age of household heads, households' access to market, households access to extension, households access to credit, land size and household structure (family size). To confirm the validity of the idea that each of the variables had the potential to hinder households from pursuing superior livelihood strategies, a multinomial logistic regression analysis was used. One important advantage of multinomial logistic regression analysis over descriptive analysis is that it allows analysis of the impact of each individual variable on households' choice of a particular livelihood strategy, assuming that the other variables remain unchanged. Table 6 summarises estimated coefficients and estimated marginal effects. A Marginal effect can be defined as the effect of a one-unit change in the independent variables on a household's choice of a particular livelihood strategy.

**Table 6 Multinomial regression results of factors influencing household livelihood strategy**

Explanatory Variables	livelihood strategies							
	Farming		Non-farm		Farm and Non-farm		Non-labour	
	Coeff.	(P-Value)	Coeff.	(P-Value)	Coeff.	(P-Value)	Coeff.	(P-Value)
Gender (m=1, f=0)	-0.831	0.032*	0.579	0.134	1.765	0.055	-0.701	0.012*
Household size	1.793	0.022*	-0.054	0.612	0.625	0.017*	1.054	0.002*
Age (years)	0.598	0.039*	0.768	0.020*	-0.398	0.051	0.511	0.022*
Land size	1.393	0.001*	0.557	0.126	0.563	0.017*	-0.102	0.061
Credit yes=1,no=0	0.433	0.015*	1.061	0.158	0.154	0.056	0.472	-0.078
Market yes=1,no=0	0.365	0.016*	0.530	0.071	0.730	0.032*	0.542	0.065
Extension yes=1,no=0	0.543	0.032*	2.032	0.221	0.764	0.043*	0.321	0.542
Education	0.222	0.048*	0.558	0.004*	0.269	-0.058	-0.278	0.036*

Base category: Farming only

Number of observation 120

Overall Classification % 86.4

Pseudo R – Squared 0.585

Source: computation based on survey data

\* Represents level of statistical significance at least at 5% (P<0.5)

Note: Marginal effects show the average chance in the probability of livelihood strategy resulting from a unit change in the independent variable.

Tests to establish goodness-of-fit of the model fit, and the absence of heteroskedasticity, were carried out on the data. The Omnibus Test of Model Coefficients, and the Hosmer and Lemeshow Test and classification table output were determined for the assessment of the predictive power and the goodness of fit of the model. Table 7 presents the results for the Goodness-of-Fit Tests, and indicate a good fit of the model, at least in respect to the Hosmer-Lemeshow (2000) approach. The results for this approach show that the  $p$ -values were higher than the chosen probability level for the multinomial regression modelling ( $p=0.05$ ). This implies that the predicted values of the response variable are close enough to the values observed.

**Table 7 Goodness-of -fit Tests of model used**

<b>Omnibus Test of Model Coefficients</b>		
Chi-square test	Degree of freedom (df)	p Value
113.44	10	.00002
<b>Hosmer-Lemeshow Test</b>		
Chi square	Degree of freedom (df)	p Value
10.233	8	.1121
<b>Overall Classification %</b>	Before inclusion of predictors	After inclusion of predictors
	64.5%	76.4%

As noted by Pallant (2011), the Omnibus Test model Coefficients gives us an overall indication of how well the model performs. In analysing the results a 95 percent confidence interval was used, implying that for the  $p$  value to be significant, it must be  $p < .05$ . In the current case, the  $p$  value is 0.0002 at a Chi square of 113.44 with 10 degrees of freedom.

The results shown in the Hosmer and Lemeshow test in Table 7 support the model as the best. According to Pallant (2011), this test is interpreted differently from the Omnibus Test. He states that for the hosmer-lemeshow Goodness of fit test, good fit is indicated by a  $p$  value greater than .05. This opposes the Omnibus Test which implies that the in order for the  $p$  value to be significant, it should be  $p < 0.05$ . In this case the model generated a Chi square value of 10.233 with a  $p$ -value of .1121 which is  $> p$  value .05 thus supporting the model. Results of the

classification table showed an improvement from the 64.5% value (before the inclusion of predictor variables) to 76.4% (after inclusion of predictor variables). As noted by Pallant (2011), a classification table provides an indication of how well the model is able to predict the correct category.

#### **4.17 Household-head age**

The results presented in Table 6, showed that the age of heads of households significantly influences the choice of farming, non-farm or non-labour as the livelihood strategy. An increase in the age of the household head is likely to stimulate the choice of farming as a livelihood strategy. Younger farmers are expected to be more technically limited than older farmers who are perceived to have acquired experience of farming and resources. This observation was supported by Fraser *et al.* (2003), who stated that older farmers are likely to have more resources at their disposal than young farmers.

The presence of the dairy project may also have attracted economically active members of adult households who took the available employment at the dairy projects. On the other hand, the results show a positive association between old age and farming livelihood strategy. The reason might be because older farmers are perceived to have acquired experience in farming and have more of the resources needed. Similar findings were reported by Vedeld *et al.* (2004), who attributed the association to the dominance of the old households in farming activities. Depending on the nature of available non-farm activities, Kohlin and Parks (2001) argue that older people may lack the physical strength and time to engage in most non-farm dairy activities.

#### **4.18 Household size**

The positive estimated coefficient presented in Table 6 shows a relationship between household size and the probability of choosing farming and farm plus non-farm activities as livelihood strategies, by households around dairy project. These results show a positive association between household size and only farm and farm plus non-farm activities. This is as a result of the labour intensive nature of cropping and livestock activities which are common in the only farm

livelihood activities (Kabubo-Mariara, 2008). Furthermore, combining farming activities together with non-farm activities demands more labour which results in the study results agreeing with the discovery of Reardon (1997), who reports that a larger family size increases the ability of a household to supply labour to the farm and other activities. Being an additional child of the household head is more likely to influence out-migration, which suggests another line of the division of labour, apart from farming, within the household. Block and Webb (2001) found a positive association between family dependency ratios and diversification. This could be because households with more child labour have better chances to be involved in activities such as fuel wood trading, running small businesses or livestock management which employ child labour. The presence of dairy projects in the rural areas may have significantly influenced the households to mix farming with dairy activities.

A Similar relationship is found between household size and non-labour activities. For every unit increase in household size, there is an increase in the probability of undertaking non-labour as the livelihood strategy (either social grant or remittances and pensions). This might be the influence of child grants given to the households according to the number of minors below the age of 18 years. Furthermore a limited livelihood option in the rural areas has influenced the households to depend on government grants.

#### **4.19 Household-head gender**

With respect to gender, the results presented in Table 6 shows negative estimated coefficient for gender participation in only-farm livelihood activities and non-labour livelihood strategies. The results show greater participation of females in farming and non-labour livelihood strategies than males. This confirms literature findings by Narain *et al.* (2005), which link participation of female headed households and farming activities. Female headed household are culturally expected to take care of the children left by their fathers, and are more likely to be the beneficiaries of child support grants or child maintenance (Narain *et al.* 2005). It has generally been argued that female-headed households are more vulnerable to food insecurity and non-income aspects of poverty because of their inability to participate in productive activities. For example, cultural restrictions on women's ability to participate fully in food production

activities, and cultural practises that do not support the education of girl children in some of the poorest areas of South Asia, have left the women vulnerable in times of economic crisis (Kabeer, 1990). Therefore, the dairy project fits well because of its ability to increase the number of female taking up dairy livelihood activities.

On the other hand, the observed positive estimated coefficient between gender and the farm plus non-farm livelihood strategy, shows that households headed by males were statistically significant to participate in farm and non-farm livelihood strategies. This implies that an increase in the number of males increases the probability of transition from farming to farm plus non-farm livelihood strategy. Males are being able to be involved in many activities male households have energy to take extra activities during off days, and to take up other activities that add to their total income and that improve the household welfare. These results support several studies suggesting that female headed households may be less likely to participate in non-farm activities, mainly because of culture, social mobility limitations and differential ownership of/access to assets (Adugna, 2005).

#### **4.20 Land size**

The results presented in Table 6 shows a positive estimated coefficient between household head involvement in farming and farm plus non-farm livelihood strategies with respect to increase in land size. This suggests that greater land size statistically increases the probability of household's involvement in farming only and farm plus non-farm livelihood strategies. Households with large areas of land were linked to farming and farm plus non-farm livelihood strategies. Households with more hectares of land might have realised that if land can be used effectively, it can provide a lucrative livelihood strategy that deserves to be chosen. Households living around dairy projects have been influenced positively by the rural dairy projects to utilise their land effectively in order to produce more grain that can be used by the dairy project as animal feed. Provided that owners of land are getting meaningful returns, several studies reveal that the larger the land size, the less likely it is that owners will be willing to diversify into other non-farm activities because of the demanding nature of farm activities (Berehanu, 2007).

#### **4.21 Access to extension**

As observed in Table 6, there is a positive estimated coefficient between the number of extension visits and the household's involvement in farming and non-farm livelihood strategies. The results are statistically significant predictors of a household with access to extension choosing farming as livelihood strategy. The findings show that, the more extension contact with households, the better the chance of the household undertaking farming as their livelihood strategy. Extension services are an important source of farming information and advice to smallholder farmers (Enki, Belay and Dadi, 2001). These results oppose findings by Samuel (2003), which state that there is a positive association between frequency of extension services and diversification into non-farm activities.

#### **4.22 Market access**

As expected the results show a positive estimated coefficient between market access and households choosing farming and farm plus non-farm activities as their livelihood strategy. The shorter the distance from the agricultural market place, the greater the significance of adopting farming and farm + non-farm livelihood strategies available. This is because, the greater the distance to the market place, the higher the transport costs and the greater the need for transport facilities, therefore households will not be willing to produce products which do not have market. Households that are located at far distances from the point of sale do not get access to market because they do not possess the means to transport their produce. The dairy projects have proved to be a lucrative market place for fodder crops since they are used as animal feeds. As a result of this, many rural households around the projects choose farming and farm plus non-farm livelihood activities because of the available market that is located close to the point of production.

#### **4.23 Access to Loans and/or credit**

Results presented in Table 6 showed that there is a positive estimated coefficient between households who had access to agricultural loans and the choice of farming livelihood strategy. Households around dairy projects who cited that they had received loans from the dairy project as a form of capital, have invested their loans in agriculturally related activities. Foltz (2005) developed a model that links credit access with agricultural profitability and investment in Tunisia. His findings show that credit constraints negatively affect farm profitability. In the

absence of credit support from the institutional agencies, the resource poor rural households are not able to start their own non-farm enterprises because these enterprises require more start-up capital than they have (Geberu and Beyene, 2012).

#### **4.24 Education**

The positive estimated coefficient between more years of education and farming only livelihood strategies, shown in Table 6, indicates a statistically significant link between the number of years spent gaining an education and the probability of the household heads choosing farming as a livelihood activity. This shows that for agricultural productivity to be high, it needs the household to have acquired some educational skills. This is because agricultural knowledge, skill and attitude are shaped through education.

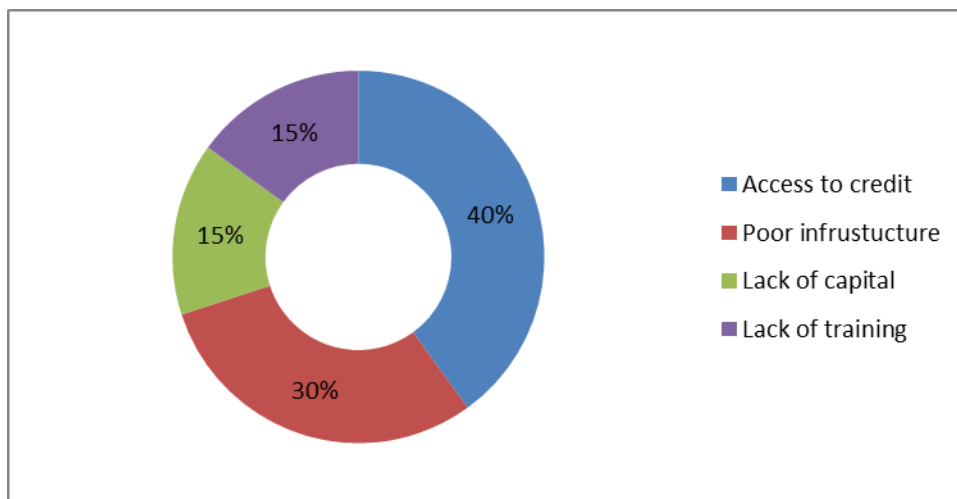
This research also shows a positive association between education and involvement in non-farm livelihood. This is also supported by the empirical evidence of Micevska and Rahut (2008), which found a positive association between education and participation in non-farm activities. Barrett *et al.* (2001) notes that education was one of the most important determinants of non-farm earnings, especially in more remunerative and skilled employment in rural Africa.

The results also show a negative estimated coefficient between education and the likelihood of relying on non-labour livelihood strategies. Less educated households run out of survival options and are only left with the adoption of non-labour livelihood strategies. The dairy projects influenced positively the households in surrounding communities to further their education by offering wages that would enable the households to be able to pay school fees and to upgrade their studies.

#### **4.25 Institutional barriers in undertake high return livelihood strategies**

Choosing high return livelihood portfolios is important for the rural households in poverty affected communities but various constraints hinder the participation by rural households around dairy projects from making use of high return livelihood strategies. Rural households in the study area face problems when attempting to undertake high return livelihood strategies. Identification

of constraints is crucial for future policy formulation. The major institutional challenges that are identified in this study include: poor household asset base, poor rural infrastructure, lack of access to credit facilities, lack of awareness, a shortage of training facilities and a lack of opportunities in the non-farm sector. These institutional factors are shown in percentages in Figure 16 below.



**Figure 16 Institutional barriers to high return livelihood strategies**

**i) Access to credit facilities**

Limited lack of access to credit facilities is one of the major limiting factors affecting rural households in pursuit of high return livelihood strategies. In the absence of credit support from the institutional agencies, the resource poor rural households are not able to start their own non-farm enterprises since these require more start-up capital than they have access to (Geberu and Beyene, 2012). Households that are unable to acquire loans from financial institutions due to a lack of collateral are forced to engage themselves in non-labour activities.

**ii) Poor infrastructure**

Infrastructure plays an important role in the development of rural livelihoods (Gebru and Beyene, 2012). Improved communication helps make access to market easier, which is important for both buying and selling of goods and services. It is also important for getting non-farm jobs. Good road networks, effective telecommunications, electricity and clean water availability enhance economic development in the rural areas. Poor infrastructural development in the study

area, hamper industrial development. This also reduces the chances of rural household undertaking livelihood strategies that improve their welfare. Some of the villages are situated far away from the major tarred roads. The introduction of dairy projects in the rural areas has greatly improved the infrastructure in the area and poor road network is no longer a problem.

### iii) **Lack of capital**

A lack of the capital needed to start and run a business affects rural households around dairy projects preventing them from taking up non-farm livelihood. Some of the rural households in the study area were not having assets necessary for self-employment and this was another obstacle to livelihood diversification. Ownership of assets such as livestock ploughs and carts may enhance rural households pursuit of only farm livelihood strategies. The dairy project has also played a major role in ensuring that the smallholder farmers overcome the challenge of a lack of capital by creating partnerships with them farmers and by selling shares to them so that they can access majors assets required to start dairy farming.

### iv) **Lack of awareness and training**

Lack of awareness in rural households of the dairy projects and the training they offer reduces the chances of households choosing non-farm livelihood strategies that are linked to dairy projects. Not all rural households in the study area are aware of the dairy projects provided by the South African government for the development of the rural sector. Some of the rural households in the study area cannot even access the training programs offered by the government in the rural areas due to illiteracy and poor infrastructure. Some rural households lack information regarding modern income-generating activities this is due to the limited information dissemination mechanisms employed.

## **4.26 Chapter summary**

The results of the study show that rural people living around rural dairy projects undertake various livelihood portfolios. These include ‘farming’, ‘farm and non-farm’ portfolios, ‘only non-farm’ portfolios, and ‘non-labour’ portfolios. Empirical findings of the study have shown that households headed by people who are well educated, are within the economically active

groups (measured by age), and that have market access, are more likely to be undertaking non-farm livelihood activities as a way of improving their welfare. From the results, households headed by women, households with large family sizes, households with large area of land, households where the age of the household head is between the ages of 30 and 60, and households with access to market, credit, and extension services, undertake 'farming' as their livelihood strategy. Households headed by people with tertiary and university levels of education are more likely to be involved in 'non-farm wage' livelihood strategy than those with no education or primary and secondary levels of education.

On the other hand, households headed by women, children, and older people, that live in a community without a suitable market for agricultural products, and whose heads are less educated, are more likely to participate in less remunerative livelihood strategies (non-labour). Findings show that households headed by women, children under the age of 30, and people older than 60 years are depending on non-labour strategies (remittances and social grants).

With reference to age, the results suggest that there is a positive correlation between young households in the communities around dairy projects (head under the 30 years) and the decision to choose social as the livelihood portfolio. This is in contrast to households in the economically active age between 30-60 years, who are eager to participate in non-farm and farm plus non-farm livelihood strategies which have high returns.

## **CHAPTER 5: CONCLUSION AND POLICY RECOMMENDATIONS**

### **5.1 Introduction**

This section provides a chronicled summary on the research findings regarding the livelihood strategies of communities around Fort Hare and Middle Drift rural dairy projects. In line with the objectives, recommendations to address the outcomes of the research are also outlined in succeeding subsections.

### **5.2 Research Conclusion**

The large dairy projects were established in Nkonkobe municipality rural areas with the primary objective of generating revenue for the households in communities around the dairy projects. This was done in the hope of using positive returns from dairy project as a catalyst for socio-economic growth of rural people. The revenue from dairy project employment was reported to be high which caused the households in communities around dairy projects to choose dairy project linked activities to improve their welfare.

Non-farm as well as farm plus non-farm livelihood strategies were indicated as the best strategies households undertake to cope with various socio-economic challenges they faced and to improve household livelihoods in this poor rural area. Old aged households, that is, households above the economically active age of 60 years undertake non-labour (social grants, remittances and pension) and farming only as their livelihood strategy, indicating higher levels of dependence of rural households on the government grants and remittances despite the presence of fully functioning dairy projects. This study has found that the presence of rural dairy projects means that households around these projects are beneficiaries of dairy project related livelihood strategies.

As land available for expansion of agriculture becomes increasingly scarce, non-farm employment must expand in order to reduce rural poverty. Similar to Barrett *et al.* (2001b), this study indicates that the non-farm sector has the potential to increase rural employment and improve income distribution. Expanding non-farm opportunities in rural areas outside of

agriculture also help to reduce the migration of rural dwellers to the cities, and to slow the spread of urban congestion. This can arise from an increased number of job opportunities in rural areas.

A multinomial logistic regression model for the correlation of livelihood strategies undertaken indicated that a lack of access to credit, markets, and extension services may be some of the current institutional constraints inhibiting households from participating in farming projects efficiently. These factors were shown to have a significant effect on the farming only livelihood strategy. In addition, household size, gender, marital status, education level and age may influence the livelihood strategies pursued by rural households. These factors may influence whether they move away from risky strategies to other portfolios that have high returns. The study, therefore, suggests that dairy projects, according to the evidence provided by the study findings, may be trusted as a reliable and sustainable livelihood source that can be introduced to many rural areas with the cooperation of other livelihood portfolios.

### **5.3 Findings and recommendations**

The finding that non-farm only and farm and non-farm wage earners are better off suggests promotion and support of wage employment opportunities in rural areas. This could come through promoting the investment of more dairy projects in rural areas as well as addressing the factors that limit rural people from undertaking livelihood strategies linked to dairy projects.

It has been realized from the results of the study that rural people around dairy projects no longer remain confined to crop production, dairying, fishing, forest management or livestock-rearing alone but that they construct and combine a range of livelihood strategies in their struggle for survival and improvement in their standards of living. This highlights that economic rural structures undergo changes continually and that understanding these changes in a given area would enhance the chances of better-formulated development policy interventions.

This study has found that some households link farming activities to dairy projects by growing fodder crops for the animals. Some respondents also outlined that they had started to keep dairy animals since the dairy projects had been implemented. They stated that they were able to do this

because they had received mentorship in dairy farming. Certain respondents, who had not been working before the project started, reported that they were now employed at the dairy projects.

The study also finds that community investment in new initiatives such as rural dairy projects is unlikely to deliver their rural development goals if the recipient communities do not perceive how and where it complements with their livelihoods. Therefore great wisdom has to be invested by those who plan for, design and support new initiatives, so that they understand household perspectives and adapt to them in order to boost the positive impact on livelihoods, and minimise the conflicts with other economic activities.

To address poor households' access to high income activities, the following socio economic policies, among others, are critical: policies that promote participation of women in economic activities; promotion of education in rural areas in general; improvement of rural infrastructure to reduce problems of market access, promotion of farmer training through extension services. Strengthening the formal and the informal education system as well as vocational training should be promoted to households around rural dairy projects so as to increase rural household's participation in more viable livelihood strategies that offer better prospects for improving their livelihood.

The lack of access to financial services for the informal, micro and small enterprise are acknowledged as constraints on potential diversification into non-farm economy activities by households around dairy projects, therefore the financial institutions are encouraged to improve loan access to small entrepreneurs.

The recommendation of the study to the policy makers is that the rural non-farm sector needs its due share of development policies as it has the potential to uplift the rural areas. More precisely, the formal wage sector needs urgent support to boost the standard of living of rural households. The finding gives the economic direction to policy to design policies that promotes and support non-farm activities as a means to address poverty in rural areas. To make a meaningful difference in the lives of poor households in rural areas, policy makers and development practitioners have to create more awareness in the minds of rural people about opportunities to

diversify into non-agricultural activities. This might show the importance of having dairy projects in the rural areas as these contribute towards household income.

#### **5.4 Areas of future studies**

Areas that need future research include the investigation of the type and availability of assets influencing households in communities around dairy projects in undertaking various livelihood option. In addition to this, studies are needed to find out any linkages between land policies and a shift from farming to non-farming activities. Full devolution of user rights to local communities from the current statutory rights to use natural resources as part of a local authority, may be another missing policy link which needs further research. Further studies are needed to test the significant difference in the pattern of these activities across the villages around dairy projects and those that are in areas without dairy projects.

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**UNIVERSITY OF FORT HARE**  
**FACULTY OF SCIENCE AND AGRICULTURE**  
**DEPARTMENT OF AGRICULTURAL ECONOMICS & EXTENSION**  
*Rural households livelihood strategies in communities around the Fort Hare and  
 Middle Drift rural dairy projects in Eastern Cape Province South Africa*

Questionnaire Number:

Village:

**A. HOUSEHOLD CHARACTERISTICS:**

**1. A] Household structure**

	<b>Sex</b> 1] Male 2] Female	<b>Age</b> 1] <20 2] 21-30 3] 31-40 4] 41-50 5] 51-60 6] 61-70 7] 71+	<b>Marital Status</b> 1] Single 2] Married 3] Divorced 4] Widow	<b>Education</b> 1] No education 2] Primary 3] Secondary 4] Tertiary 5] University 6] Other	<b>Occupation</b> 1] Retired 2] Unemployed 3] Farmer 4] Self-employed 5] Other
<b>Head</b>					
<b>Spouse</b>					
<b>Child(ren)</b>					

**Salary scale**

Unemployed	Below 1000	1-5000	5-10 000	Over 10 000 (net)
0	1	2	3	4

**Dependency Ratio**

Number of dependents	Below 2	2-4	5 and above
Code	1	2	3

**Land ownership**

Type of ownership	Community	Private	lease
code	1	2	3
Size (Ha)			

**Access to credit**

Access to credit	Yes	Total amount per year (R.....)	No
Code	1		2

**Access to Social grants**

Access to Social grant	Yes	Total amount per year (R.....)	No
Code	1		2

**Remittances**

Access to remittances	Yes	Total amount per year (R.....)	No
Code	1		2

**Market access**

Distance to the nearest major market	Below 10km	10-15km	Over 15km
Code	1	2	3
<b>Problems of marketing</b>	1. Distance	2. information	3. low price

**SECTION B (ECONOMIC ACTIVITIES)**

Major source of income (Indicate with an X. N.B you can indicate more than two sources)

Source	Agriculture	Wages & Salaries	Social Grants	Remittances	Farm and non-farm
	On-farm	Non-Farm	Non-Labour		
Code	0	1	2	3	4

Household Livelihood strategies pursued during the 2011/12 season

Livelihood strategy	Economic Activity	Income obtained
On-farm	Animal production	
	Crop Production	
Non--farm	Wages/Salaries (dairy)	
	Part time jobs	
	Sales (non-wage)	
	Grants	
Non-Labour	Remittances	
	Donations/gifts	
	Credit	
	pension	
<b>Total</b>		R

Sources of employment (1) ... government (2) ... NGOs ... (3) ...Tourism..(4) Tourism (5) Dairy

During which time do you take up part time jobs (1)... off season (2) ... on farming season (3) ... Night

Physical assets purchased/obtained from the main livelihood adopted

Asset	Year purchased/obtained	Expected monetary value
1. Livestock		
2. House		
3. car		
4. other		
Total value		R

Household expenditure

Code	Goods and services required (needs)	Average Cost
1	food	
2	Energy, water and shelter	
3	cash	
4	School fees	
5	transport	
Total cost		R

Are you getting any benefits from the dairy project? [1] ..... Yes [2] .....No

If yes may you specify the type of benefit in the following table.

Job description	Job status	Salary/wages	Training	Mentored in
1] milking	1] permanent		1] livestock management	Dairy entrepreneurship
2] feeding	2] temporary/ seasonal		2] milking course	1] Yes
3] driving	3] casual			2] No

	4] cleaning 5] other	4] other		3] breeding course 4] other	
Household head					
Spouse					
Child(ren)					

List any other benefits you get from the dairy project ..... [1] beef meat (culled cows).  
[2].... Calves [3] ..... dung. ....[4] Market for maize .... (5) other.

Uses of	wages	Pension	Remittances
1. Buy food and other essentials			
2. invest in additional labour			
3. cope with drought			
4. purchase of inputs			

Has your diet changed since the introduction of the Dairy project in the area?

1]..... yes                      2]..... no

What cause you not to pursue dairy project activities?

(1) ... shortage of time, (2)... No interest (3) ... low wages... (4) ... shortage of skill ... (5)  
...other

Indicate your daily meal change from the time the dairy project was introduced in your area

Meals per day	Breakfast	Lunch	Super
Before dairy project	1] once 2] twice	1] once 2] twice	1] once 2] twice

	3] Nil	3] Nil	3] Nil
After dairy project was implemented	1] once 2] twice 3] Nil	1] once 2] twice 3] Nil	1] once 2] twice 3] Nil
	Food secure	Quantity Short	
Before dairy project	1] Yes 2] No	..... .....bags	
After dairy project was implemented	1] Yes 2] No	..... .....bags	
Strategies used to solve food shortages	1] Borrowing/buying credit 2] Selling livestock 3] Reducing portion 4] Omission of meals		

**Perception towards the project** (1).. Takes grazing area/ compete for natural resources (2)... Damage our land ...(3) ... pollutes our land...(4) ... other.

### C. ANIMAL PRODUCTION

#### CATTLE

Cattle	Bulls	Cows	Heifers	Oxen	Total
Number					
Number sold					
Price/ Animal					
Number slaughtered					
Number donated as gifts					
Number used for batter trade					

Other uses of cattle (1)... ploughing (2)... Transport (3) ... Cultural asset (4) ... other

**Products and Uses**

**Milk:**

Uses of milk: home consumption..... for sale .....

**Milk Productivity**

<b>Milk Produced (Jan-Dec)</b>	<b>Unit price (R/L)</b>	<b>Average household consumption per year</b>	<b>Quantity for Sale in 2011/2012</b>	<b>Quantity given away</b>	<b>Market 1] local 2] Dairy 3] Other</b>
Dairy cow					
Goats					
Other ( specify)					

**Skin/ Hides**

<b>Skins obtained (Jan-Dec 2012)</b>	<b>Price of the products</b>	<b>Total revenue obtained</b>

**SHEEP**

<b>Sheep</b>	<b>Rams</b>	<b>Ewes</b>	<b>Lambs</b>	<b>Total</b>
Number				
Number sold				
Price/ sheep				
Number used for batter trade/donated				

**Products and Uses**

**Mutton:** Number of sheep slaughtered (Jan-Dec 2012):

Nature of sheep slaughtered: Rams..... Ewes.... Monetary Value of mutton consumed R.....

**Milk:**

Uses of milk: home consumption .....L for sale .....L

Number of sheep milked (Jan-Dec 2012)	Approximate capacity of milk obtained per day per sheep	Total Quantity obtained	Price of milk per litre	Total Revenue

**Wool:** Number of sheep sheared

Quantity of wool sold (year 2012)

Amount of money obtained R.....

**Skin**

Skins obtained (Jan-Dec 2012)	Price of the products	Total revenue obtained

**GOATS**

Goats	Rams	Ewe	Kids	Total
Number				
Number sold				
Price/ Animal				
Number donated as gifts				
Number used in ceremonies				

**Products and Uses**

Monetary value of meat consumed R.....

**Milk:**

Uses of milk: home consumption..... for sale .....

Number of cows milked (Jan-Dec 2012)	Approximate capacity of milk obtained per day per goat	Total Quantity obtained	Price of milk per litre	Total Revenue

**Skin**

Skins obtained (Jan-Dec 2012)	Price of the products	Total revenue obtained

**PIGS**

Pigs	Boar	Sow	Piglets	Total
Number				
Number sold				
Price/ pig				

Monetary value of pork consumed R.....

**Crop production**

Do you own land for crop production? Yes (1) No (0) (tick the appropriate)

Production (Hectares occupied)

Year/ Crop	Sweet-potato	Cereals	Vegetables	Legumes	Others/ harvesting of trees
2009/10					
2010/11					
2011/12					
2012/13					

Household **CROP** production

Name/ type/ variety grown: .....

Year	Area grown	Average yield	Price per unit	value obtained

Household reasons for growing the crop

Reason	Quantity/ ha	Monetary Value/ kg	Gross amount of money
Home consumption			
Sale			
Animal Feed			

**Thankyou for your cooperation**