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Working Papers

7. Kenya Dairy Goat and Capacity Building Programme: A socio-economic baseline report

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KDGCB Programme Staff

No. 7

Kenya Dairy Goat and Capacity Building Programme: A socio-economic baseline report

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FARM-Africa Working Papers

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FEEDBACK

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About the project

FARM-Africa's **Kenya Dairy Goat & Capacity Building Programme** aims to establish a sustainable system of community-based goat production and animal healthcare. The initiative will be strengthened and supported by both community-based organisations and local extension services provided by the Government of Kenya.

About the team

The research for this baseline survey was conducted by Dr Alastair Bradstock, Patrick Mutia, Jacob Mutemi, Isaac Mbeche, Dickson Kariba, Anthony Muriithi, Edward Chege, James Kithuka, Esther Mwongeli and Patrick Singi. The findings were written up by Dr Bradstock with input from the above-mentioned staff.

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Contents

1. Introduction

Background information on FARM-Africa

FARM-Africa has been working in Kenya since 1987. Its first project was the Pastoral Development Project (PDP) that was implemented in three northern districts of Kenya (Samburu, Marsabit and Moyale, see Map 1 on page 4). The PDP aimed to develop an innovative extension model that would deliver a range of services (for example, animal husbandry, veterinary inputs, human health) to the marginalised nomadic people living in this arid region of Kenya.

The PDP project was implemented for approximately 14 years and was funded by a range of donor organisations with the main one being the Canadian International Development Agency (CIDA). Other organisations such as the European Union (EU), CORDAID and DANIDA made significant financial contributions to the project.

Before the project closed in the early 2000s, FARM-Africa ran a series of workshops to capture the lessons and experiences of implementing the project. The interested reader is referred to the FARM-Africa website where five publications can be downloaded that describe these issues in some detail.[1]

In the mid-1990s, FARM-Africa planned a goat project (Dairy Goat and Animal Healthcare Project) in Meru District situated to the north east of Mount Kenya (see Map 1). This new initiative built on experience that FARM-Africa had gained from implementing goat projects in both Ethiopia and Tanzania. This project was fully funded by the British Government's Department for International Development (DFID) and closed in 2004.

In the early 2000s, FARM-Africa started planning a new goat project (Kenya Dairy Goat and Capacity Building Programme, hereinafter referred to as the Mwingi and Kitui Project) in the Mwingi and Kitui Districts with the aim of testing the Meru goat model in a more arid environment. A project proposal was developed and submitted to the EU who agreed to fund the project for a two-year period. In September 2006, the EU approved a one-year no cost extension that will allow the project to continue until 2007.

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[1] http://www.farmafrica.org.uk/view_publications.cfm?DocTypeID=13 Camel Husbandry and Production; Animal Health; Natural Resource Management; Micro-enterprise Development; The Mobile Outreach Approach.

The structure of the paper is as follows. The first section outlines a selection of some of the key events that have occurred in Kenya since the National Rainbow Coalition (NARC) came to power in 2002 as well as providing some background information about Mwingi and Kitui Districts. This is followed by a description of the research approach and methods that were used to collect the data in early 2005. The next section describes the asset status of the sample households and investigates variations in holdings between different per capita income groups. The following section explores the livelihood activities of households and describes the income sources that group members rely upon to sustain and develop their livelihoods, and the final section concludes.

Kenya

The Mwingi and Kitui Animal Health Project was launched approximately two years after the NARC came to power in 2002. The NARC party defeated Daniel Arap Moi's Kenya African National Union (KANU) party that was founded in 1960 and had held power since the country gained independence in 1963.

NARC inherited a country whose institutions and economy had been severely weakened by years of mismanagement. Many human development indicators were in decline. The World Bank's country briefing paper (August 2006) shows that in 1995 primary education enrolment had fallen to 82 per cent after peaking at 91 per cent in 1989; the HIV/AIDS epidemic eroded gains made in health indicators, for example, the infant mortality rate (per 1000 births) went up from 62 to 78, and life expectancy declined from 57 to 47 years. In 1992 Kenya's Human Development Index rank was 125 and by 2002 it had fallen to 148. Once one of East Africa's most prosperous countries, Kenya was in visible decline with disintegrating infrastructure, ineffective public services and widespread corruption. Thus the NARC's manifesto commitments to addressing corruption and to improving the effectiveness of public services were well received by civil society organisations and the Kenyan public alike.

The Kenyan Government's most recent Poverty Reduction Strategy Paper (PRSP), published in 2005, recognises the fact that the agricultural sector is well placed to play a central role in not only reducing poverty but also improving food security.[2] The report highlights that while small-scale farmers account for 70 per cent of marketed production, their yields are below

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[2] http://www.imf.org/external/pubs/ft/scr/2005/cr0511.pdf#search=%22prsp%20kenya%22

average. Thus strategic investments in, among other things, research and extension, financial services, land administration, agricultural inputs and marketing are ways in which the government seeks to address this weakness.

The PRSP also gives prominence to the livestock sector as it has a high growth potential and notes the important part domesticated animals play in underpinning the livelihoods of small-scale farmers. The Kenyan Government plans to improve the productivity of this sector by implementing a strategy for disease outbreak prevention and control, and improving the quality of service provision.

The focus of FARM-Africa's project is to raise the productivity of local goats owned by small-scale farmers. In essence, this will be achieved by: introducing a cross-breeding programme, animal husbandry training, on-farm fodder establishment and management as well as developing the technical capacity of community members to administer basic veterinary treatments.

The project area

Kitui and Mwingi Districts are situated between 400m to 1,800m above sea level. The climate is hot and dry for most of the year, characterised by unreliable and erratic rainfall which makes this area less productive than, for example, the highlands of Kenya. The district has two rainy seasons with the long rains occurring between March and May and the short rains from October to December. The annual average rainfall ranges between 400-700 mm.

Productivity

Some of the key characteristics of the project area include small land holdings of approximately half a hectare in extent; widespread poverty with approximately 60 per cent of the population living below the poverty line, and extensive food insecurity with many households being dependent upon food aid.

Because small farmers in the project area are poorly organised, they are often excluded from gaining access to high value markets both within and outside the district. This is another factor that contributes to low returns from agriculture and constrains the agricultural sector from developing sustainable pathways out of poverty.

Map 1. FARM-Africa's projects in Kenya
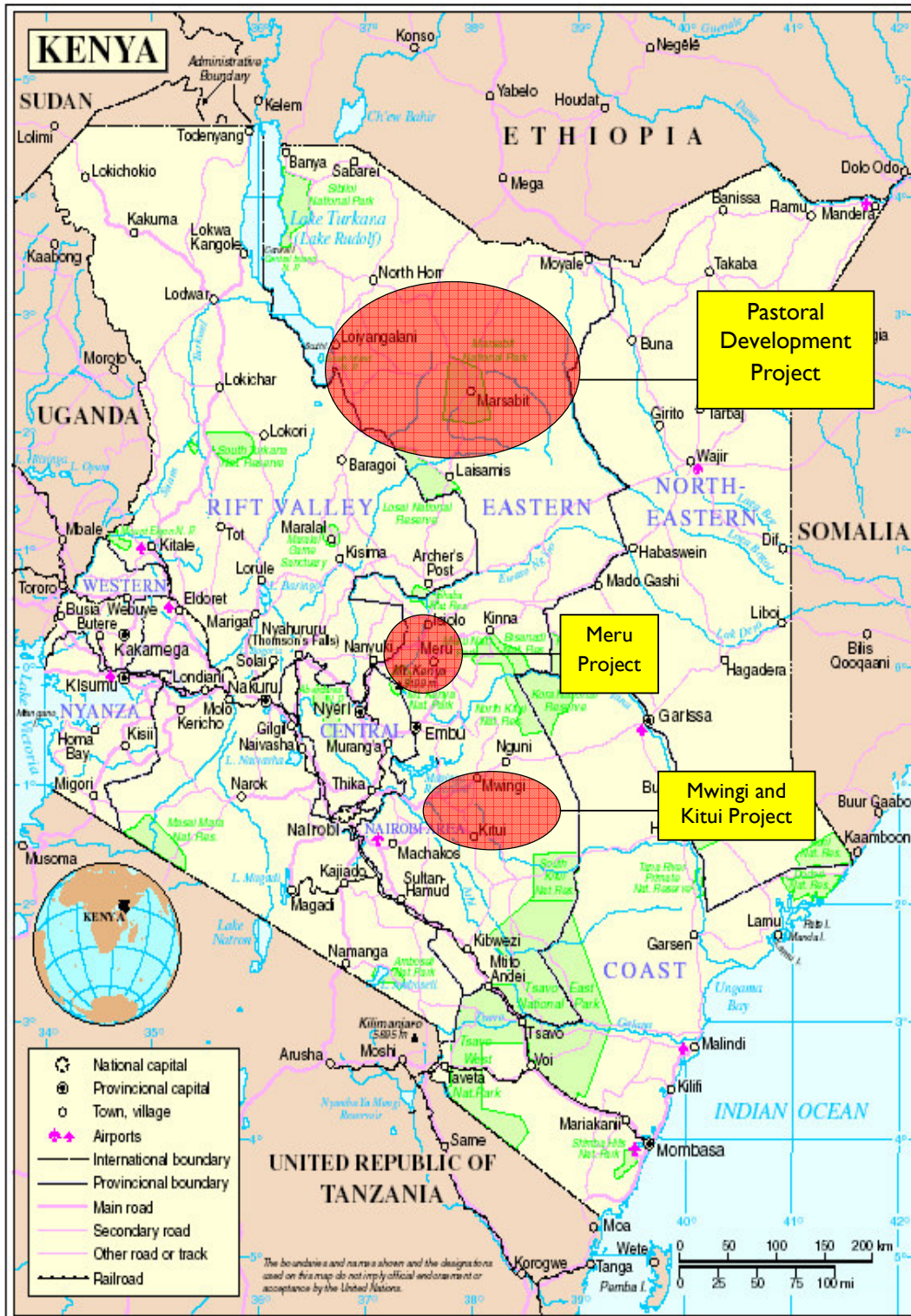
2. Research approach and methods

The research for this study was undertaken between March and April 2005. The research methods were designed to discover the current livelihood circumstances of households in the Mwingi and Kitui Districts of Kenya in order to establish a socio-economic baseline from which changes in a household's assets and incomes will be measured in the future. The follow-up research work will attempt to establish the impact that adopting the goat model has had upon a household's asset holdings and income sources. The livelihoods framework (Carney, 1998) was used as the methodological approach to understand the circumstances, options and constraints that affected the households in the two districts. The research's remit was limited and quantitative data, for example, the productivity of local goats was to be covered in a separate study.

The research process was comprised of two main elements: wealth ranking and a household questionnaire. A combination of qualitative and quantitative methods was used as the literature on this subject suggests that the research outcome is of higher quality when these two complementary methods are combined (Chambers, 1983). The outcome of the wealth ranking exercise, which drew heavily upon Grandin's (1988) work, was a random sample of 102 households that was purposively targeted at poorer households. This process involved a small group of people that were chosen to ensure an age, wealth and gender balance. The other element of the research process was a household survey that covered 102 households. This was designed specifically to gather quantitative information about households' asset holdings as well as their income sources. Prior to analysis, the data set was split into three per capita income groups or terciles with per capita income tercile III being the richest and I the poorest.

3. Emerging livelihoods

Land

It is well recognised that agriculture is a key livelihood activity of Kenya's rural poor. Table 1 below shows the distribution of land holdings across the sample and the striking feature of the table is how many households own less than one hectare of land. The median land holding of the sample is 1 hectare. Results from a recent nationwide study showed that the average farm size in the country was 0.5 hectare (Jayne et al., 2003). However a study undertaken by Freeman et al. (2003) in a similar agro-ecological zone to that of the project area showed that the average land holding was higher at 2.43 hectares. Moreover, examining land holdings of the three per capita income groups shows that the richest own nearly one and half times more land (1.1 hectare) than the poorest (0.8 hectare). The data were so variable that medians were used to compare land holdings between the different groups.

Table 1. Distribution of land, Mwingi and Kitui	
Area owned (hectares)	**Per Cent**
0.0 - 0.50	25
0.50 - 1.00	24
1.00 - 2.00	22
2.00 - 5.00	22
Greater than 5.00	7
Total	**100**

Source: Sample survey conducted in March – April 2005

Jayne et al. (2003) argue that those households controlling less than 0.5 hectares of land are effectively landless. Thus using this definition of landless effectively 25 per cent of households are landless and this has implications for adopting the goat model which are alluded to later in this section. Moreover as the size of the average household is approximately seven people or five adult equivalent units[3] coupled with the high incidence of poverty, it is unsurprising that many households are chronically food insecure as was mentioned earlier in the paper.

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[3] Men aged 15 years or older are allocated one adult equivalent unit, women aged 15 years or older are allocated 0.8 of an adult equivalent unit, and male and females under the age of 15 years are allocated 0.5 of an adult equivalent unit.

The research results provided further evidence to suggest that current land holdings were insufficient to meet households' production strategies. For example, the median quantity of land used for farming was marginally larger than the amount of land owned, suggesting that households in the project area were being forced to borrow or rent land to meet their production strategies. Indeed, the research findings showed that 15 per cent of the 134 plots of land being cultivated were being either rented or borrowed by households.

One of the premises of the FARM-Africa goat model is that, for improved goats to reach their productive potential, they must be fed correctly and their physical condition must be maintained. The important issue that this finding raises is that, where farmers have small land holdings, the project will have to find innovative ways in which to grow fodder without further undermining domestic food production. One obvious strategy will be to grow fodder on the soil and water conservation structures that are so common in the area and are not usually used for food production. How farmers address and solve this land constraint will be monitored over the course of the project.

Considering the high population densities and small land holdings in the project area, the household questionnaire sought to understand how secure households felt their rights were to the land they cultivated. Of the 93 households who responded to the tenure security question, 62 per cent believed that their right to their land was high. Interestingly of the 62 per cent of households, only five or nine per cent of them had title deeds to their land. The three key factors that gave rise to the notion of tenure security was inheriting the land, length of time working and living on the land, and purchasing the land. Other, less frequently mentioned, reasons included developing the land, and the land being surveyed in preparation for demarcation. Even though these households felt their tenure security was high, 56 per cent felt that they could still increase it by securing a title and 44 per cent believed that developing their land, for example, through planting trees, demarcating their boundaries and establishing soil conservation structures, would all contribute to increased security of tenure.

Evidence from Kenya and Tanzania suggests that those households that successfully adopt the FARM-Africa goat model have higher per capita incomes and more effective asset accumulation strategies than non-adopters. In the light of this fact, the project will implement a system to monitor these changes that will focus on, among other things, examining whether goat model adopters are more successful at acquiring land than non-

adopters, and whether adopters are employing strategies that lead to improved tenure security over the land they cultivate.

Livestock

Livestock are a key element of rural household's livelihoods especially where precipitation rates are low and rainfed crop production is irregular. Households are frequently able to use the income streams from the sale of livestock and livestock products to develop pathways out of poverty. These can include, for example, the intensification of agriculture through investing in technologies that enhance productivity as well as the development of non-farm economic activities that help to diversify income portfolios, thereby making livelihoods less vulnerable to covariate risk (Reardon et al., 1992; Ellis, 2000; Ellis and Mdoe, 2003). Livestock can also play a key role in helping households cope with the negative effects of drought. In southern Africa, research has shown that households without livestock were less able to manage the negative effects of drought than households that owned animals (Kinsey et al., 1998; Owens et al., 2003).

The research results show that 42 per cent of all households own at least one large animal such as a cow, goat, sheep or donkey, and goats are the most popular animal with 36 per cent of these households owning at least one of them. In contrast only 15 per cent and 20 per cent of households own cattle and donkeys respectively. Moreover, the ownership of large animals is heavily concentrated in male-headed households: of the 41 households owning large animals, 60 per cent are male-headed.

When chickens are included in the analysis, the results show, however, that 80 per cent of households in the sample own livestock. To enable comparisons between different species, livestock holdings were converted into 'Cattle Equivalent Units' (CEUs). This was achieved by taking market value ratios between the mean current price (five per cent trimmed mean) of different livestock species. The results are as follows: cattle = 1; goats = 0.17; chickens = 0.02; donkeys = 0.85. Table 2 below shows clearly that for the majority of livestock species ownership is skewed, as reported above, towards male-headed households.

Table 2. Livestock ownership by gender of household head, Mwingi and Kitui Districts			
Livestock type	Male-headed households	Female-headed households	Total (as a % of all households)
Chickens	54	19	73 (72%)
Goats	25	10	35 (34%)
Donkeys	13	7	20 (20%)
Cattle	9	6	15 (15%)

Source: Sample survey conducted in March – April 2005

While the median CEU value for male-headed households (0.17) was very similar to the median value of CEUs of the sample (0.19), the value of CEUs for female-headed households (0.89) was over four times larger than the median, both for the sample and for male-headed households.[4]

In summary, the results show that the livestock holdings (measured in CEUs) for the majority of households in the sample are low. Indeed chickens are the dominant animal owned by approximately half of livestock-owning households. With such low and poorly diversified holdings, it is unlikely that many households will be able to realise the potential benefits of owning livestock that were described earlier in this section. Moreover, this finding emphasises the importance of FARM-Africa's animal husbandry training for those households that will receive pure-bred and cross-bred goats as the results show that many of them may have little technical expertise in this area.

During the research process an insight was gained into how better-off households accumulate wealth through livestock. The key elements of the strategy are as follows. Rich farmers purchase cattle from pastoralists situated in or around Garissa to the northeast of Mwingi (see Map 1). The animals are then transported to the project area where they are distributed to poor farmers. The duration of the contractual arrangement between the two parties varies but may last from 18 months to two years. During this time the recipient is allowed to use the animal for draught purposes as well as consuming and/or selling any milk. In return the farmer is expected to keep the animal in good health and where farmers fail in

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[4] This stark difference in animal ownership is strange. Unfortunately, the research findings were unable to suggest which factors may have contributed to this result. While the result may be correct, it is possible that errors may have occurred during data collection where, for example, women may have over reported and men under reported their livestock holdings.

this responsibility, they will lose the animal. When the animal becomes ill, the farmer is obliged to notify the owner and, if it dies, the animal's skin must be returned to the owner, otherwise the farmer will be required to pay the full value of the animal.

Quantitative analysis is required to identify the costs and benefits arising from these agreements. However, discussions with a selected number of farmers indicated that the rich capture the majority of the benefits available in this arrangement. While recipient farmers gain access to an animal, their rights are limited to usufruct and this makes it impossible for them to integrate the asset fully into their livelihood strategies. Moreover, they will have to set aside resources, for example land and labour, to ensure that the animal remains in good health. Where land and labour have an opportunity cost, it is possible that these resources might be deployed more productively elsewhere in the farming system.

In contrast, the level of benefits accruing to the rich appears to be significant. The two most prominent are savings in land needed for grazing, and in labour time required to sustain the animal. In addition, by distributing animals to poorer farmers, individuals that own land can use their land to achieve the most productive outcomes given their resource endowments. This strategy is particularly applicable for younger richer individuals who do not own land but want to establish or increase their livestock holdings.

Further research is required before any definitive statement can be made about the nature and extent of the costs and benefits arising to these two groups.

Credit

The literature contains numerous examples of how poor people are often discriminated against in the credit market. The four main reasons which combine to cause the rural credit market to fail include the lender having insufficient information about the borrower; the borrower not having sufficient collateral; the high transaction costs that financial institutions incur when dealing with small borrowers in remote rural areas; and the high risk of default due to the occurrence of shocks or moral hazard. The literature also explains the workings of the credit market and how in recent decades new initiatives have been developed to address the failures listed above. The reader is referred to the following references for a detailed description of the issues (Ellis, 1992; Adams and Von Pischke, 1992; Matin et al., 2002; Moseley and Hulme, 1998).

Considering that financial services are poorly developed in this remote part of Kenya, and that the sample was purposively comprised of poor people, *a priori*, it is likely that the majority of households will not be accessing the formal credit market. Indeed the research results confirm this assumption. Only one of the 19 households that was borrowing money had negotiated a loan from a formal credit institution. The remainder were members of informal credit groups known locally as 'Merry-go-Rounds', more broadly referred to as 'Rotating Savings and Credit Associations' or ROSCAs. These groups are usually, but not always, comprised of women (in this study all of the individuals accessing credit were women) who agree to contribute the same amount of money on a regular basis. The groups vary in size but usually they are relatively small so that the time between receiving money from other members is kept to a minimum and small groups have the additional advantage of being more cohesive than larger ones.

Once a group is formed, the women agree when each member will receive the group's contribution. Groups are often flexible enough to accommodate the effects of extreme events so that the group does not collapse. Thus the group may extend the time between each meeting, reduce the amount of contributions, agree to support an individual member that is experiencing difficulties in maintaining their contributions and, *in extremis*, dissolve the group until more favourable conditions re-emerge. These types of schemes are popular and have been successfully implemented in countries like Bangladesh (Grameen Bank) and Bolivia (Bancosol).

The literature on the use of credit by poor people suggests that they predominately borrow to satisfy immediate consumption rather than investment needs (Matin et al. 2002; Moseley and Hulme, 1998). The research results broadly confirmed this generic finding and showed that the majority of households that had accessed the credit market had done so to purchase consumption items such as food and clothing, although a minority had invested in improving their human capital through education and health care.

What these findings suggest is that if technologies cannot be adopted without households securing access to external sources of finance, it is unlikely that they will be taken up widely. From previous experience elsewhere in its programme, FARM-Africa made a provision in the project budget for poor people to access a revolving credit fund, enabling, for example, Community Animal Health Workers to purchase veterinary drugs.

Housing

The quality of housing across the sample was poor but arguably representative of what the majority of rural households experience in the developing world. For example, the walls of 96 per cent of houses were constructed either from bricks (made locally) or from soil. The dominant roofing material used by households was either corrugated iron (53 per cent) or thatch (44 per cent). Only 10 per cent of households were able to construct a cement floor with the majority using soil. While 99 per cent of households did not have access to piped water, 69 per cent were using potable water. However the average distance that household members have to walk to access potable water is 3 to 5 kilometres and 10 to 15 kilometres during wet and dry periods respectively. None of the households included in the survey had access to electricity and this is not surprising considering that only 0.5 per cent of rural households have access to Kenya's national grid (Agumba, 2006).

Houses are often poor people's main physical asset and, where they have security of tenure, it may be used as collateral to secure loans for productive purposes that can have a positive effect on their welfare (IFAD, 2001). Moser's (1998) work on asset vulnerability in the Philippines, Ecuador, Hungary and Zambia confirmed this view. A house can be used for a variety of both consumption and production purposes, for example, using rooms in the house to make goods for the market, and leasing a room can help to increase household income.

However in this study there was no evidence to suggest that houses were making a contribution to household's livelihoods and the research findings demonstrated that none of the households was using this asset for productive purposes. The low levels of purchasing power in the project area may explain why the majority are using their houses for consumption purposes only as the opportunities to diversify their livelihoods is limited. Livingstone (1997), drawing on studies carried out in Sierra Leone, Kenya, Ghana and Tanzania, shows how low levels of economic growth are often a feature of rural communities.

Productive tools

Another asset that was investigated was the ownership of tools that can be used for farming. While a wide variety of household assets/tools was counted during the sample survey, an attempt was made to distinguish between those that were economically productive and those that were not. For example, assets such as tables, chairs and cooking equipment were

deemed not only to be agriculturally unproductive but also economically unproductive as there was no evidence that any household was using these assets to generate income. Other tools were excluded on the same grounds.

Table 3 shows the mean value of tools owned by households in the three per capita income groups. While the two poor income groups have similar holdings, the richer group is significantly larger.

Table 3. Mean value of productive tools by per capita income tercile, Mwingi and Kitui			
Productive tools	**Tercile I (poor)** *n = 34*	**Tercile II (middle)** *n = 34*	**Tercile III (better-off)** *n = 34*
Mean value of tools (Kenyan Shillings)	798	633	1,430

Source: Sample survey conducted in March – April 2005

One striking finding from the analysis was the low ownership of productive tools across the sample. For example, only six per cent of households owned an ox drawn plough, only 12 per cent owned a bicycle, 35 per cent of households did not have access to a paraffin lamp and only half owned a table. A tools index was developed and it provided further evidence to emphasise this point; showing that approximately 20 per cent of households owned no productive tools at all and 77 per cent had tools worth less than KSH 1,000 [5] or the equivalent of five spades or one third of a bicycle.

Economically Active Adults

Another asset that was studied was the number of Economically Active Adults (EAA) resident in households. These were defined as all male and female adults between the ages of 15 to 65 years old exclusive of those individuals in full-time education. Table 4 below shows the distribution of EAAs across the sample. The median values show that the number of EAAs in the three per capita income groups is similar, with the poorest group having one more EAA than the others.

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[5] Kenya Shillings

Table 4. Distribution of Economically Active Adults by per capita income tercile, Mwingi and Kitui Districts				
Income Tercile	HHs with EAAs	Median number of EAAs	Mean number of EAAs	Std. Deviation
I n = 34	33	3	2.76	1.28
II n = 34	34	2	2.38	1.1
III n = 34	34	2	2.18	1.1

Source: Sample survey conducted in March – April 2005

The research results demonstrate that across the sample the median number of residents per household is two (the variability of the data was too great to use mean values). This finding is the same as other similar studies elsewhere in the country (see for example, a livelihoods research study undertaken by Freeman et al. (2003) in the districts of Suba and Bomet in western Kenya).

There are differences of opinion among researchers about whether a large number of EAAs enable households to improve their standards of living or whether they constrain a household's ability to construct pathways out of poverty (see for example, Reardon et al. (1992) who argue that in Burkina Faso, more household members are associated with an increased ability to develop non-farm activity and an increase in per capita income but Sender's (2000) research in the Mpumulanga province of South Africa found a negative relationship between these two variables).

However the results from this study produced no significant correlations. While the correlation between the two variables (per capita income and number of EAA) was positive, it was very weak and insignificant.

Examining the number of potential EAAs in the three per capita income groups and the percentage of those individuals that are employed produces an interesting trend. While the poorest tercile has the largest number of EAAs (94), only 64 per cent of them are employed.

84 per cent of EAAs in the middle per capita income tercile are working, which is marginally less than the richest group that has 87 per cent of individuals employed.

The research findings demonstrate the limited number of poorly paid, low skilled occupations that EAAs have managed to secure in the project area. For example only 11 per cent of the 60 EAAs from the poorest tercile that are working are pursuing livelihood options off their own farm. While this group shows the lowest degree of occupational diversification, 83 per cent of EAAs from the middle and the richest per capita income groups are involved in their own agricultural operations. Interestingly only one person was employed by the government, only three people worked in the private sector and two were self-employed. Thus from an occupational perspective, the majority of active EAAs are farmers. However, as will be described below, this does not imply that households are deriving the majority of their income from on-farm activities.

Educational attainment of Economically Active Adults

One of the NARC party's manifesto pledges was to make primary education free for all Kenyan citizens, with children from poor backgrounds being given preference. Since coming to power, the evidence shows that the government has indeed made significant increases to the education budget. According to the Kenya Institute for Public Policy Research and Analysis (http://www.kippra.org/Free.asp), in the financial year 2003-2004, 4.8 billion Kenyan Shillings were allocated to the education sector and by 2005-2006 this had increased to 7.8 billion Kenyan Shillings. This was one of the first reforms that NARC implemented when they took power in 2002.

Since independence, citizens had to pay for sending their children to primary school and this led to poor people being excluded from the educational system. Studies showed that in the late 1990s, 80 per cent of children of primary school age were attending school (Bennell, 2002). The research findings of this study demonstrated that 95 per cent of children between the ages of six and 14 (the period of time when children are supposed to be attending primary school) were enrolled at a primary school.

The results show that the mean educational attainment (measured in education years) of the best educated EAA resident in the household is eight years, suggesting that primary school has not quite been completed, but that individuals should have acquired basic skills in arithmetic, reading and writing. As the data were normally distributed, the mean figure is representative of the population. The finding also show that there are no significant

differences between the mean educational attainment of the three per capita income groups, all of which were similar to the sample mean.

The data presented in Table 5 below shows the stark differences between the educational achievement of the poor and the rich. Whereas only three per cent of the per capita income tercile I have attended an educational institution beyond primary school, nearly one third of rich households have been educated to this level. This finding is explained by the fact that, in Kenya, poor people experience great difficulties in accessing secondary education due to the high cost of school fees. The differences between the poor and the middle group are not so striking for completing up to nine years of education, but beyond primary school the difference is obvious, with the middle group showing a much greater ability to access secondary and tertiary education than the poor.

Table 5. Number of completed education years by the most educated EAA of the three per capita income groups, Mwingi and Kitui			
Education years	Per capita income tercile I n=33 (per cent)	Per capita income tercile II n=34 (per cent)	Per capita income tercile III n=34 (per cent)
0-6	37	21	18
7-9	60	62	50
10-12	3	17	32
Total	100	100	100

Source: Sample survey conducted in March – April 2005

It has been argued that migrants are often the most educated members of households and by leaving, they may constrain the adoption of new technologies that might lead to productivity increases, improvements to the local environment and increases to per capita incomes (Wiggins and Proctor, 1999; De Haan, 1999). The results from this study are particularly relevant to this project. Approximately 40 per cent of households had members that were working away from home and of those, 50 per cent were the best-educated members of the household.

With regard to the project's training inputs, as 58 per cent of households do not own large animals, FARM-Africa will have to assess animal husbandry skills carefully. The low levels of education will also have to be taken into account when designing and delivering training inputs to facilitate the adoption of pure and cross-bred goats to beneficiary households.

This recommendation will be of particular relevance for female-headed households whose mean and median educational achievement was four and zero years respectively. However male-headed households are better educated and on average have been to school for seven years which is close to the sample mean.

Livelihood activities and incomes

The research findings demonstrate that two activities generate over 60 per cent of household's mean annual income. These were crop production (34 per cent) and non-farm activities (27 per cent). For low and middle income households they comprise approximately 65 per cent of total income and, for the richest third of households, 57 per cent of average annual income.

The three most important crops, defined as their monetary contribution to total crop production, were maize (45 per cent), cowpeas (15 per cent) and pigeon peas (10 per cent). What the findings also indicate is that most of the food grown by farmers is being consumed at the household level, for example, 82 per cent of maize, 89 per cent of cow peas and 73 per cent of pigeon peas remained at the household. This suggests that the majority are farming predominately for subsistence purposes. Less than 10 per cent of households were growing fruits (bananas, oranges and mangoes being the most common) either for the market or for home consumption and their contribution to household income was insignificant.

The research also sought to establish how households were spending their income. The literature suggests that poor people spend the majority of their disposable income on food to meet self-provisioning needs. The findings demonstrated that 87 per cent of expenditure made by 30 households over the course of the previous 12 months was being spent on food[6].

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[6] This figure was produced as follows. 30 households were randomly selected and asked to record all of their purchases over a two-week period. These expenditures were summed and multiplied by 26. This figure provided an estimate of the amount of money that households are spending on frequently occurring consumption items over a 12-month period.

The research findings illustrate clearly why households are spending such a large percentage of their disposable income on food. In the survey, households were asked to list what crops they had harvested over the preceding 12 months and to indicate how much they still had in their stores at the time of the interview. The results showed that over the 12-month period, the average household's maize store had been depleted after five months and cowpeas after four months.

Therefore the emerging picture from this part of the study is that the households interviewed are unequivocally poor; they are largely subsistence farmers; many are food insecure; they have little interaction with output markets; and they spend the majority of their disposable income on food. Moreover the data reveals that their daily per capita income is less than US $1 per day – the rather crude but widely used measure of absolute poverty.

Non-farm activities

While households were engaged in a variety of different non-farm activities, the most frequently occurring jobs were working on other households' farms (57 per cent) and labouring jobs (20 per cent). While some households had secured more skilled jobs in the local economy, such as teaching, sales assistants and woodwork, only a minority of individuals had successfully secured these types of positions.

With regard to differences in households managing to secure non-farm jobs, the emerging pattern is that the richest are the most successful per capita income group and 97 per cent of these households have at least one individual employed in this sector. The middle group is slightly less successful at 94 per cent, and the poorest group have the lowest participation rate in non-farm activities, with only 76 per cent of households securing these non-farm type jobs.

What the results also revealed is that richer households were more successful in accessing a wider variety of non-farm jobs than poorer households. For example, while poor households had only managed to access four different types of jobs, individuals from the richest per capita income group were engaged in 10 different types of occupation and the majority required more skills and experience than the jobs secured by individuals from the two other poorer groups.

Natural resources

The next most significant source of household income is the use of the natural resource base. The most frequently occurring activities include the small-scale production and sale of honey, firewood, bricks, ropes, mats, charcoal, handbags/baskets, brewing beer and sand.

When compared, however, to the numbers of households growing crops (100 per cent) and those engaging in non-farm activities (94 per cent), this activity has a participation rate of only 60 per cent. The research findings suggest that it is the better-off households who have the resources required to exploit these opportunities. For example, only 50 per cent and 59 per cent of poor and middle income households respectively had managed to integrate natural resources into their livelihoods, whilst 71 per cent of households in the better off group were successfully deriving income from this source.

Livestock

While the research results show that livestock is the fourth most important income source, it is relatively insignificant and only comprises of eight per cent of households' mean annual income. Moreover, there are no significant differences in the amount it contributes to the three different per capita income groups, and none of the groups receive more than nine per cent of its annual income from this source. Changes in this variable will of course be monitored carefully over the course of the project to determine what impact the new technologies introduced by FARM-Africa have on the establishment of new income sources and acquisition of assets.

Income portfolios

Table 6 below shows the different income sources that households from the three per capita income groups draw upon. As noted above, crop production, non-farm income activities and natural resources are the main sources of income and comprise of 81 per cent, 84 per cent, and 81 per cent for the poor, middle and rich per capita income groups respectively. Other less important sources include livestock (already discussed above) private transfers (remittance incomes) and physical transfers. The latter category includes, among other things, food aid and gifts from a variety of sources.

Table 6 below shows how physical transfers make a minor contribution to mean annual household income. What is of interest is that, during the previous 12 months, 92 per cent of

households received income from this source. Only crop production had a higher participation rate. The results reveal that the high number was due to the fact that both Mwingi and Kitui were experiencing a drought in 2004 and 2005 and, as a consequence, during the last year approximately, 90 per cent of households had received some type of food aid (supplied either by government or by NGOs). This study did not attempt to investigate whether food aid had been targeted at the poorest families. Food aid in the project area is mostly distributed by the government through various NGOs through community-based targeting that focuses on very vulnerable households. It is interesting to note that over 90 per cent of the households collaborating with FARM-Africa receive emergency relief food.

Table 6. Income sources for Mwingi and Kitui households				
Income sources	Per capita income tercile I (poor) n = 34	Per capita income tercile II (middle) n = 34	Per capita income tercile III (better-off) n = 34	Total n = 102
Crop production	37.2	32.5	33.1	33.6
Livestock	7.8	6.1	8.2	7.5
Natural resources	9.2	11.4	17.5	14.6
Non-farm self-employment	7.4	8.5	6.3	7.1
Non-farm wages (wage income)	27.6	32.1	23.7	26.6
Private transfers	5.4	4.6	8.2	6.8
Physical transfers	5.4	4.8	3.0	3.8
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: Sample survey conducted in March – April 2005

Another monitoring objective of the project will be to investigate how and if adopting cross-bred goats affects the resilience of a household's livelihood. The assumption being that those households that adopt this new technology will be more able to cope with and recover from shocks. The project will explore whether it is possible to estimate a minimum herd size that must be realised for a household's livelihood to become more robust.

Non-farm self-employment

In this research study non-farm self-employment is defined as individuals who are running their own businesses. The enterprises identified were small and concentrated on selling food and consumables (petty trading, for example, water, bread, tea) as well as selling fruits and vegetables. It is noteworthy that none of the businesses identified were involved in manufacturing, although the finding is predictable considering the low levels of economic activity in the area, the low ownership of assets and the difficulties in accessing complementary assets such as credit. As an income source for households, Table 6 shows that self-employment contributes less than 10 per cent of annual income. However, of those 20 households that have initiated these types of activities, it is more important and, on average, comprises over a fifth of their annual income. With regard to the distribution of these businesses across the sample, 85 per cent of them are concentrated in the rich and middle per capita income groups.

Private transfers

While Table 6 above shows that private transfers or remittance incomes are an insignificant source of income compared to non-farm self-employment, this is not the case for the 22 households who have an individual(s) sending them money. Indeed the mean annual amount comprised nearly one third of these households' annual income. Moreover remittance incomes, unlike non-farm self-employment, are more evenly distributed across the per capita income groups (seven households in the poor group, six in the medium group and nine in the richest group). In addition, there appears to be a positive correlation between per capita income and the amount of money remitted to households, with each per capita income group receiving approximately double the amount of the poorer group.

The literature regarding how households use remittance incomes indicates that poor households frequently purchase food and other goods for immediate consumption and richer people often use the money for investment purposes. The results of this study are broadly in line with these findings. For example, over half of the households in the poorest and middle per capita income group used their remittance monies for consumption purposes, but only 40 per cent of the richest group did so with the majority being invested to improve the productivity of their assets. For example, households were enhancing their agricultural productivity through the purchase of improved seeds and fertilizer as well as developing their human capital through education.

4. Conclusion

This study provides strong evidence to show that many of the households identified by the FARM-Africa project are significantly poor. Asset ownership across the sample is low, for example, 25 per cent of households are effectively landless; nearly two-thirds of families own neither small nor large ruminants, and those that do are predominately male-headed; one-fifth of households own no agriculturally-productive tools and the majority have very small holdings; few households are accessing the formal credit market and those that do are mostly purchasing food; many households had failed to grow sufficient food to satisfy their own requirements; and, in the 12 months preceding the study, almost 90 per cent had received food aid. The results also showed that the average educational achievement of the best educated EAA demonstrated that primary school had not been completed and considerable variability existed between men and women, with the former achieving the sample mean of eight years of education and the latter achieving only half that amount.

With regard to the different income sources that households are drawing upon, the results demonstrate very low levels of diversification and a high level of dependence on both crop production and off-farm wages. This reliance on the agricultural sector makes many households highly vulnerable to shocks, for example droughts, that negatively impact upon the agricultural sector.

FARM-Africa's proposal, submitted to the European Union in 2003, identifies poor smallholder farmers as the project's main target group, and the results from this study suggests that this group has been successfully identified.

Experience, however, suggests that choosing poor households as the recipients of new agricultural technology can be problematic. The literature on technology adoption suggests that richer rather than poorer households are most likely to adopt new technologies, as they are more able to cope with the risks of embracing new practices than poor families. The results suggest that few households in the sample would be able to adopt all but the simplest of technologies due to their income and asset poverty. However, the FARM-Africa project, benefiting from previous interventions elsewhere in the region, has planned a set of inputs that will overcome the lack of assets and market failures (for example, the credit market) thereby reducing the risk of households integrating pure-bred and cross-bred goats into their farming operations.

At a policy level this project is extremely well placed to make a contribution to effectiveness of agriculture as a possible driver of economic growth and poverty reduction in rural arid areas of Kenya and the findings may well have relevance in the region and elsewhere. To make such an input, however, the project will need, among other things, to assess the differences in productivity (for example, meat and milk) of cross-bred goats compared to local goats, as well as understanding how the income generated by cross-breds is being used (either for consumption and/or for investment purposes) and whether goats yield sufficient amounts of money to enable households to devise their own sustainable pathways out of poverty.

Appendix One

Table 7. Kenya dairy goats and capacity building programme - groups data															
District	Division	Group name	No. of members	M	F	Married	Separated	Single	Widowed	No. of children	Nursery/ primary	Secondary	College/ university	No. of orphans	Amount of milk (litres)
Kitui	Kitui Central	Wendo wa Kyangunga	25	8	17	12	0	0	13	161	41	8	2	5	0.5
Kitui	Chuluni	Kamale	21	5	16	16	2	0	3	93	68	3	1	0	0.4
Kitui	Chuluni	Mutethya	25	8	17	17	0	2	6	113	69	2	2	6	0.5
Kitui	Chuluni	Samuka	25	10	15	16	2	0	7	94	75	2	1	15	0.5
Kitui	Chuluni	Ithumula	26	9	17	24	0	0	2	100	42	4	1	21	1.5
Kitui	Kitui Central	Kwa Ngindu	25	2	23	13	1	3	9	138	51	6	1	15	0
Kitui	Kitui Central	Kwa Ukungu	25	7	18	12	0	5	8	124	62	6	2	15	0
Kitui	Kitui Central	Itethye Utethye	25	10	15	21	1	0	3	151	51	6	7	36	0
Mwingi	Nuu	Ngaani	23	8	15	16	0	2	5	133	44	6	6	4	1.0
Mwingi	Nzeluni	Utethyo wa Ngya	20	4	16	14	0	3	3	119	60	3	3	0	1.5
Mwingi	Nuu	Nyaani	22	8	14	14	0	2	6	117	40	3	0	15	0
Mwingi	Nzeluni	Nzeluni Farm	19	5	14	17	0	1	1	62	38	0	2	4	0.5

Mwingi	Nzeluni	Muamba wa Tei	25	4	21	17	0	5	3	104	74	7	1	3	0
Mwingi	Nzeluni	Utethyo witu	24	5	19	19	1	0	4	113	72	7	2	3	0.6
Mwingi	Nzeluni	Utethyo Nzeluni	21	3	18	17	0	1	3	92	44	1	1	3	1.0
Mwingi	Nuu	Kyangati	25	8	17	15	0	0	10	117	46	4	0	27	0
Mwingi	Nuu	Malawa	29	12	17	21	2	1	5	162	84	16	8	5	0.5
Mwingi	Ngomeni	Kavaani	25	10	15	21	1	0	3	141	77	8	0	0	0
Mwingi	Ngomeni	Kavuti	24	7	17	14	7	0	3	102	48	2	0	0	2
Mwingi	Ngomeni	Mitamisyi	25	10	15	19	0	5	1	99	31	3	1	0	4.5
Mwingi	Ngomeni	Kamusiliu	23	8	15	17	0	0	6	130	53	4	0	31	0.5
		Totals	**502**	**151**	**351**	**352**	**17**	**30**	**104**	**2465**	**1170**	**101**	**41**	**208**[7]	**15. 5** [8]

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[7] Amount of milk produced represent the total number of milk in litres currently produced by the 502 group members within our 21 groups.

[8] Represent orphans within the groups. Some orphans have been co-opted into the groups after their parents died. In other instances respondents included orphans within the village but whom group members support individually or as a group.

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