**Mitigation of Climate Change in Agriculture (MICCA) Programme
Background Report 4**

Socio-economic Survey
EADD-MICCA Pilot Project in Kenya

Final report

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MICCA Programme

Pilot Project:
Enhancing agricultural mitigation within the East Africa Dairy Development (EADD) Project in Kenya

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0. EXECUTIVE SUMMARY

Working within FAO's main efforts of sustainable food security, nutrition and productivity, the Mitigation of Climate Change in Agriculture (MICCA) Programme's main goal is to help developing countries contribute to climate change mitigation in agriculture and move towards low-carbon emission agriculture. In Kenya, the MICCA Programme, in collaboration with the East African Dairy Development Project (EADD), is focusing on introducing climate-smart agriculture into the livestock sector.

The objective of this socio-economic survey is to collect data on current livelihoods and agricultural practices, and gain a greater knowledge about the impacts of climate change among small-holder farmers in the project areas. The survey design should be utilized in the same way or adjusted as a tool to evaluate the outcomes and impacts on the socio-economic situation of other MICCA Programme activities, such as capacity development and greenhouse gas assessments.

In the survey, 357 households were visited by six enumerators in six locations at the Kaptumo EADD site. Focus groups and key informants were also interviewed. The households were selected randomly and are representative of the locations. The team is aware of possible interviewer effects and other factors affecting the validity and reliability of data.

The demographics within the sample are in line with national statistics. It is heartening to note that the level of school attendance is quite high in the sample. Household and farm assets are rather basic (mobile phones, radios, hoes and shovels). Only a few individual households can afford more luxurious items (refrigerators, cars, carts, threshers). Almost all households use wood as their main energy resource, with an average per capita wood consumption of 3.1 kg (median 2.4 kg) per day. These figures are much higher than the national average of 1.5 kg.

The majority of the interviewees (91.9 percent) practice both cropping and livestock. The most common animals are cattle (92 percent) and chickens. This reflects the Kalenjin cultural tradition of raising large livestock, rather than smaller animals, like goats or sheep. The herds are made up of cross-breeds of Aryshire and Friesian. Households own on average 5.4 animals, with project participants owning generally one additional animal. This runs contrary to the EADD approach, which emphasizes down-sizing famers herds while improving their overall milk productivity on the farm.

More than two-thirds of all respondents keep their cattle predominantly on paddocks (63.9 percent). Less than one-quarter keep them grazing on communal land (21.4 pecent), and another 9.9 percent tether their animals. The land used for paddock is on average 0.9 acres. No farmer in the household survey has installed a zero-grazing unit. The concept of zero grazing is known among farmers and promoted by the Kaptumo Division and EADD.

The daily average volume of milk per cow in the sample is 4.2 to 4.8 litres. The daily average volume for all cows per farm is 9.8 litres. Project participants produce on average three litres more than non-participants. Almost all households use their milk for their own consumption and sell their surplus on a regular basis. Although the income figures from milk sales for project participants are not much higher than the overall sample values (8.5 percent mean, 14.7 percent median) they are significantly higher than those of non-participants (15 percent mean; 23.2 percent median). Calculations show that the monthly income generated from selling milk accounts for 30 percent of the monthly household income (mean).

The main feed for livestock is grass. Two-thirds of the farmers feed Napier grass mainly to milk cows. About three-quarters of the farmers use feed supplements, one-quarter use feed concentrates, and a

rather small number use crop residues as feed. The reasons why on-farm fodder production is not higher include a shortage of land, limited finances and lack of knowledge. However, the awareness of the impact of improved fodder on milk production and the willingness to learn about it is evident. Farmers apply manure on their own fields, especially for fodder crops, or discard it in the surrounding land. Most of the manure however is wasted by grazing cattle on paddocks. Using climate-smart agriculture principles to improve manure management and providing training on applying manure on appropriate crops could contribute to more on-farm fodder and crop production. This could be important entry point for the MICCA Programme in its cooperation with the EADD.

Farmers plant up to six different types of crops on an average size land of 2.2 acres per farm. Maize is the predominant crop (23.2 percent of all given answers), followed by beans (14.9 percent), bananas (12.2 percent) and tea (12.1 percent). Almost all crops (besides tea) are grown for the farmers' own consumption with surpluses being sold. The annual average income is between 25 000 KSH[1] and 50 000 KSH per crop. The average annual income per household is 212 020 KSH (median 62 000 KSH). Project participants earn almost 40 percent more than the sample average and 2.5 times more than non-participants. Climate variability is considered a problem for agriculture, but in the broader scheme is perceived as a rather small issue. The most pressing problems are related to diseases and crop quality. It is worth noting the high prevalence of sustainable and climate-smart agriculture practices (some are implemented by more than 90 percent of the sample) in the area.

In the last 12 months, an average of 24 130 trees were planted by 118 farmers, and 4 917 trees were protected. For the MICCA Programme, it is heartening to see such a high number of the sample already planting and protecting trees. The farmers willingness to engage in agroforestry and their awareness of its benefits are necessary prerequisites for introducing different types of trees that are valuable both for fodder production and for climate change mitigation.

EADD participants made up about 37.9 percent of all interviewees. Supplying milk to the chilling plant is the most common form of participation. The main reasons for joining the project are stability of milk prices and regular pay, which leads to higher incomes. Only a few participants joined for reasons related to better breeds, cropping or fodder related topics (of interest to the MICCA Programme).

Almost three-quarters had initial investment costs, primarily for shares, membership fees and registration fees. All of these costs are related to EADD investments and are not necessarily an indicator for investments required for climate-smart agriculture. Regular ongoing costs mentioned in a few cases are for labour, equipment, medicines and fodder. Almost all participants see more benefits than disadvantages in joining the project.

The most common reasons farmers gave for not participating in the project were that they do not produce enough milk (40.3 percent) and lack the required knowledge and training about the project or livestock breeding (23.7 percent). Some farmers also mentioned that they did not to have enough money to join. Results show that farmers would be willing to invest almost four times the average amount actually required (based on expenditures of current project participants) to improve their agricultural productivity These investments would represent 5.7 percent of the average annual income (mean) and 3.4 percent of the median annual household income.

Climate change is predominantly experienced as changes in rain availability rather than in temperature variations or other indicators. More diseases and higher household expenditures are

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[1] 1 USD = 91 KSH, September 2011

seen as the most striking impacts of climate change on families. Cropping (low yields and diseases) is clearly the main area where the impact of climate change can be seen and where farmers have already made adaptations in response to the changing conditions. However, there are many opportunities for adopting additional adaptive strategies.

The main sources of household income are cropping and raising livestock. Households have up to five economically active members. Less than a quarter of these households receive financial support from external sources (relatives, credit). The average balanced annual household income is about 30 percent higher for project participants than for the overall sample value. The annual household income for non-project participants is about 20 percent lower than the sample average and about 40 percent lower than those of project participants. Using the annual gross national income (GNI) per capita of 790 USD (World Bank 2010), the per capita mean value of the annual balanced income of 737 USD is only slightly lower than the national value. However, the median value (50 percent of all respondents in the sample) of 261 USD is only a third of the national GNI per capita value. Based on poverty lines commonly used by the World Bank, three-quarters of the sample live below the 1.25 USD line per day and 86.9 percent under the 2 USD line per day.

Nevertheless, almost three-quarters of the sample consider their household situation as 'moderate' and have enough money for basics. Only 5 households considered themselves as very poor. Generally, women-headed households perceive their situation less positively. When farmers were asked about their household priorities if more money were to became available, the most common responses given were buying food and livestock.

The following entry points for the MICCA Programme and EADD are recommended:

- supporting on-farm fodder production with climate-smart agricultural tools in ways that will lead to higher milk production, less emissions, efficient manure management and possibly zero grazing.
- providing knowledge on climate change and raising awareness about how to adopt agricultural practices to climate variability
- offering tools to mitigate climate change through climate-smart agriculture and agroforestry.

Furthermore, it is essential to provide a clear transparent introduction of EADD and the MICCA Programme in villages, and communicate to farmers the conditions, costs and benefits of joining the project. The MICCA Programme should work through existing groups or persons in the villages as multipliers. The Programme should address women and men equally, as both are involved in household decision-making.

1. INTRODUCTION

1.1 The MICCA Programme and its pilot projects

Working within FAO's main efforts of sustainable food security, nutrition and productivity, the Mitigation of Climate Change in Agriculture (MICCA) Programme's main goal is to help developing countries contribute to climate change mitigation in agriculture and move towards low-carbon emission agriculture. It is developing and implementing four pilot projects in developing countries to integrate climate-smart practices into farming systems and provide evidence that smallholders can contribute to mitigating climate change when appropriate technologies are selected. Pilot projects focus on agricultural activities, such as livestock and rice cultivation, that tend to have high emissions and a high potential for their reduction.

1.2 EADD and MICCA Programme cooperation

Each of the MICCA Programme's pilot projects is a collaborative effort carried out in partnership with national and international partners within the framework of larger agricultural development projects. In Kenya, the MICCA Programme is working with EADD, led by Heifer International together with the World Agroforestry Center (ICRAF), the International Livestock Research Institute (ILRI), Technoserve and African Breeding Services (ABS). The objective of this pilot project is to integrate climate-smart activities into existing livestock systems. Livestock is an integral part of many farming systems and the largest contributor to greenhouse gas emissions in the agricultural sector. In addition, many livestock breeds cannot be genetically improved fast enough to adapt to climate change. Livestock generates about 1.5 percent of total global gross domestic product (GDP). In developing countries, livestock contributes over 50 percent of the agricultural GDP and employs about 1.3 billion people, creating livelihoods for about one billion of the world's poor. For this reason, developing climate-smart practices in livestock-based systems is critical for achieving sustainable livelihoods in the context of climate change. The integration of trees and soil management practices can increase soil carbon accumulation and offset livestock-related emissions.

EADD is being implemented in Kenya, Rwanda and Uganda. The Project's overall goal is to help one million people lift themselves out of poverty through more profitable production and marketing of milk. Since 2009, 19 sites have been identified in Kenya, and 'hubs' are being established. The hubs provide chilling plants to store and increase the volumes of sold milk; agro-veterinary services and other services; and shops for necessities, such as medication and improved fodder. EADD is working also with existing animal health services to improve artificial insemination and vaccinations in the region (Background taken from the Project Proposal, MICCA 2011).

The MICCA Programme and EADD agreed to cooperate in the Kaptumo site, which encompasses a chilling facility in Ndurio (5 000 litre tank - installed) and in Kaptumo (10 000 litre tank – planned). The hubs are managed by Dairy Farmer Business Associations (DFBA), which are shareholders in the plant and predominantly located within the community. The Kaptumo site began collecting milk in September 2010, producing 851 litres per day. The team was able to increase production to 7 500 litres per day within one year.

1.3 Objectives of the socio-economic study

The objective of this socio-economic survey is to collect data on current livelihoods and agricultural practices, and gain a greater knowledge about the impacts of climate change among small-holder farmers in the project areas. The MICCA Programme recognizes that project partners have been working with the respective communities for almost two years and notes that the project's initial

impact and changes to farmers' livelihoods are clearly visible. The data from this study should be seen as a snapshot of the current situation, as other studies have been undertaken before cooperation with the MICCA Programme began. An extensive baseline study in the Kaptumo project area before the implementation of the EADD Project was conducted by the group of EADD organizations in 2009. The study covered project sites in Kenya, Uganda and Rwanda (EADD 2009). Where applicable, the 2009 study provides essential background information and serves a reference paper for this study.

In addition, the results from this socio-economic survey should assist the MICCA Programme and project partners to draft a sustainable and locally adapted action for the development of future interventions. The survey collaborated with the capacity development, life cycle analysis and GHG assessment activities of the MICCA Programme in the development of climate-related awareness and activities.

The study design (see next chapter) was developed for the present study and should be utilized as an evaluation tool after the three-year project ends. In this way, changes and impacts due to the MICCA Programme's interventions can be identified and measured. Based on the experiences and lesson learned from this current study, the questionnaire may change in the later evaluation. After an analysis of the data and the development of indicators upon which change should be monitored, some questions might be deleted from the evaluation questionnaire with certain issues addressed in a more focused and detailed manner.

2. METHODOLOGY

2.1 Sample size

The MICCA Programme team in cooperation with the EADD team agreed to focus its future interventions on the Kaptumo EADD site, which serves six locations in the area: Kaptumo, Kaboi, Koyo, Ndurio, Kapsoas and Kapkolei. The site includes 227 000 households (number provided by EADD coordinator in Eldoret, 2011). Taking a confidence level of 95 percent and a confidence interval of 5.5 percent, a sample size of 313 households should be surveyed. Taking a lower confidence interval of 5 percent a sample size of 378 households would be more precise, based on the following sample size calculation.

$$ss = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Z = Z value (e.g. 1.95 for 95% confidence level); p = percentage picking a choice, expressed as decimal; c = confidence interval, expressed as decimal[2]

Due to time constraints and feasibility, a sample size of 360 households was agreed upon. This allowed interviews to be conducted with 60 households per location by six enumerators in ten days. As three questionnaires could not be evaluated, the overall sample size is 357 questionnaires; higher than the minimum sample size of 313 households (taking a confidence interval of 5.5 percent). As most of the locations consist of several villages, care was given to visit each of the villages. The number of questionnaires to be completed was adjusted based on the size of the village.

Table 1. Location of interview

Location of Interview	Frequency	Percent	Valid Percent
Kaptumo	58	16.2	16.2
Ndurio	60	16.8	16.8
Kapkolei	59	16.5	16.5
Koyo	61	17.1	17.1
Kapsaos	61	17.1	17.1
Kaboi	58	16.2	16.2
Total	**357**	**100.0**	**100.0**

We believe the data presented in this survey are representative for households in the Kaptumo area. However, the team is aware that interviewer effects and other errors during the selection process and interviews might have occurred. As is common for such studies, the sample therefore might be biased and is not free of external factors. The team leader did her utmost to avoid as many external factors as possible by offering in-depth training to interviewers, providing ongoing quality control of questionnaires and identifying possible risk factors.

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[2] Source: http://www.surveysystem.com/sample-size-formula.htm

2.2 Research instruments

The household questionnaire (see Annex A) consists of 58 questions divided into sections on demographics, household and farm assets, household economics, farm management (cropping and livestock), food security and access to markets. One section focuses solely on farmers experiences with and awareness of climate change and their preparedness strategies.

In addition to the quantitative household survey, focus group discussions with farmer groups, stakeholders and key informants were conducted. The questions developed for those interviews have to be understood primarily as guiding questions as discussions were expanded to other topics where possible.

2.3 Data collection

The survey followed a random selection approach in which enumerators conducted interviews in all areas of the village, starting from one central location and interviewing every third house. In locations where households were very scattered, every second house was visited. This approach ensured that all parts of the villages were included in the survey. The enumerators were very familiar with the locations and knew the subdivisions and their boundaries very well. Focus groups were organized by the project office and constituted a diverse group: adopters and non-adopters, farmer groups who employed climate-smart agriculture practices temporarily or not at all, as well as women's groups or mixed groups.

Unfortunately communication to set up the meetings was sometimes patchy. As a result a smaller number of interviews were conducted.

A two-day training session with enumerators, an assistant and data clerk was held. The session included the testing of the survey instrument in Kaptumo followed by a round of feedback from the enumerators and editing of the final questionnaire. The data collection took place between 5-16 September, 2011. Interviews were held in Swahili and translated into the local language if needed.

Picture 1. Focus group discussion in Ndurio

Each household was given a household code which will allow other project components to identify whether the households have been included in the sample or not. This code consists of a two letter location code, the initials of the household head and the year of his/her birth. In addition global positioning system (GPS) coordinates have been taken of the visited households. All data provided by the interviewees will be treated anonymously and family names will not be given out to third parties. For this reason, the list of household codes is not attached to this report. However, it can be obtained from the MICCA Programme office (micca@fao.org).

The data was analysed with statistical software *PSPP* which is an open source version of the standard *SPSS* software. The data are in *.sav* format and can be transferred into other formats, such as Microsoft Excel. The data set is available in a CD-Rom. Tables of each question can be found in Annex B.

3. FINDINGS

This chapter presents the main findings of the household questionnaire and, where applicable, the findings of the focus group discussions. The analysis focuses on the aspects most important for the MICCA Programme.

3.1 Demographics

Visits were made to 357 households in six locations. On average the households contain five persons, with a minimum of one and a maximum of nine household members. In 50 percent of all cases (median value) two adults live in a household. Households having children number 271, with an average of three and a maximum of six per household. Out of 357 households, 50 percent have one elderly person over 65 years. About 38 percent of all interviewed farmers participated in some way in EADD activities and considers themselves to be project participants. More data on project participants will be presented in chapter 3.6.

Table 2 below shows the sex of interview partners in the sample:

Table 2. Sex of interview partner

Sex of interview partner	Frequency	Percent	Valid Percent
Woman	204	57.1	57.5
Man	145	40.6	40.8
Woman and Man together	4	1.1	1.1
Boy	1	.3	.3
Boy and girl together	1	.3	.3
Total	**355**	**99.4**	**100.0**

The interviews were conducted during the day, which can explain the higher prevalence of female interviewees. Men may have been working in field, transporting milk to chilling plants or going to market.

The majority of all interviewees are married and consider a man to be head of the household (over 80 percent). In female-headed households (59 cases), the women are predominantly single (35.6 percent); others are either divorced (6.8 percent) or widowed (32.2 percent).

The mean age of all interviewees is 43 years with the majority of interviewees between 40 and 49 years. The age range varies from babies of a couple of months to the oldest household member who was 100 years of age.

In the study area the predominant ethnic group is the Kalenjin. It is not surprising, therefore, that only one person in the sample does not consider himself a Kalenjin[3]. The Kalenjin is one of the five largest ethnic groups in Kenya. They are known to be predominantly pastoralists, while some have also taken up agriculture (African Studies Center 2011).

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[3] Care should be given to this answer, as ethnic tensions are high in the area. During the field study, there was an ongoing a trial in Den Hague that was trying to address the post-election violence in the Eldoret area. It was broadcast live and closely followed by the population as it has suffered from these conflicts in 2008 and central figures in court were from this area. We need to assume that interviewees might have answered this question in favor of the predominant ethnical group to avoid being identified as a minority or causing tensions with interviewers.

In 28 households, the survey found one person that has never been to school, and in twelve cases two people have not been to school. Those who had not attended school are mainly elderly. In two households, one person (both invalids) under 14 was found who has never been to school. The majority of households have members that have been to school and/or have left it already. Taking the median, 279 households have two children currently in school. The high rate of school attendance can also be seen in seven cases where up to six children are currently enrolled in school. The high rate of school attendance can be explained by the free education policy enacted by the Kenyan government in 2008.

3.2 Household and farm setting

3.2.1 Household assets and energy

As shown in tables 3.a and 3.b, almost all households (94.6 percent) possess a radio or stereo. Most (87.9 percent) also own a mobile phone, although network coverage in some of the villages is extremely unreliable. On the other hand, only a few households are connected to electricity, making it difficult to charge phones and batteries. The lack of electricity also explains why only 3.7 percent have a refrigerator and 3.1 percent a satellite dish. Every third household has a bicycle. Only 11.5 percent of the households have a motorcycle.

Tables 3a and 3b. Household assets

Household assets (1)	Mobile phone		Bicycle		Motorcycle		Car or truck		Radio or stereo		TV set and/or DVD		Satellite dish	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	312	87.9	115	32.4	41	11.5	36	10.2	336	94.6	134	37.7	11	3.1
No	43	12.1	240	67.6	314	88.5	318	89.8	19	5.4	221	62.3	343	96.9
Total	**355**	**100.0**	**355**	**100.0**	**355**	**100.0**	**354**	**100.0**	**355**	**100.0**	**355**	**100.0**	**354**	**100.0**

Household assets (2)	Refrigerator		Own stand pipe		Own borehole or well		Own water tank		Access to shared well/borehole/ stand pipe		Latrine/toilet	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	13	3.7	64	18.0	93	26.2	84	23.6	190	53.4	352	99.2
No	342	96.3	291	82.0	262	73.8	272	76.4	166	46.6	3	.8
Total	**355**	**100.0**	**355**	**100.0**	**355**	**100.0**	**356**	**100.0**	**356**	**100.0**	**355**	**100.0**

From a sanitation point of view it is very heartening to see that 99.2 percent of all households claim to own a latrine or a toilet. On the other hand, less than half of the interviewed population has access to an improved water resource (their own stand pipe or borehole), with 53.4 percent of the households using a shared well, borehole or stand pipe. This is contrary to the international trend, in which more households tend to have access to an improved water source than a sanitation system.

Households were asked to identify their main resource of energy for cooking, heating and/or lighting. A disquieting 98.6 percent of all 357 households said wood was their main energy resource with another 1.4 percent using charcoal. A few households also mentioned using electricity (16 cases), biogas (2 cases) or solar panels (2 cases) in combination with either wood or charcoal.

The minimum use of wood per household in one week is 4 kg, and the maximum use is 1 820 kg. This figure would mean a weekly average per household consumption of 210 kg and a 49.34 kg per capita consumption. Considering the national average of 1.5 kg (Compete 2009: 10) the figures seem high. Errors may have occurred in data conversion or data entry. However, even when excluding the outliers with 20 percent of the highest values from the calculations, an average per capita

requirement per week would be 22.1 kg (median 17.1 kg) and daily requirement per capita of 3.2 kg (median 2.4 kg). The results are still quite high and need to be treated carefully. In a future survey, other methods will be required to measure the daily consumption and enumerators need to be trained on estimating and capturing measurements explicitly.

The MICCA Programme would be interested in seeing the absolute figures decrease substantially in the final evaluation survey after having engaged in activities to raise awareness on reforestation and agroforestry and providing alternative energy solutions (biogas, low-energy cookers).

3.2.2 Farm assets and farming practice

The majority of all visited farms (91.9 percent) practice cropping and keep livestock on a self-employed basis. Only 23 cases (6.4 percent) crop exclusively and only 6 cases (1.7 percent) keep livestock exclusively. The same situation applies for women-headed households, although the percentage of those exclusively raising livestock is slightly higher (6.8 percent) than for the overall sample. Those women mainly own chicken and goats.

When asked about their farm assets, 20 interviewees did not give any answer. They may have not known if they owned their respective assets, preferred not to answer or did not have any assets. Out of 335 farmers who answered this question, 99.7 percent own a hoe, 82.4 percent a shovel and 69.9 percent a machete. The latter figure might be higher, as interviewees may not have understood the word 'machete' and the interviewer may not have explicitly asked about it in the local language.

Improved farming assets like ploughs, carts, tractors and threshers are not common in the study area. Only a few responses were given regarding assets required for improved/advanced dairy farming, such as milking parlours, milking machines and teat dips. Less than half of all respondents have separate areas for human and animals, and even fewer households (19.9 percent) have any barns at all. This implies an immense hygiene and health risk, especially for children in the household, and an inefficient use of manure. The low numbers given for pulverizer ownership (2 cases) and chaff cutters (11 cases) give an indication of the low fodder production among dairy farmers. More information on fodder production will be presented in chapter 3.3.

3.3 Livestock

A general problem in the area, according to EADD staff and Kaptumo Livestock Division representatives, is the increasing milk deficit due to growing population. The expanding population is also causing farm sizes to shrink. The free ranging of cattle is not possible anymore as the land is too densely populated. Other problems seen by the Livestock Division in Kaptumo include, increasing prices for inputs, like medicine and feeds; the high costs of fodder production; and the tendency to use fertilizer for food production instead of fodder production. According to key informants, the number of cattle per household should be decreased and the remaining cattle improved by artificial insemination and proper feeding.

The majority of interviewed households own cows (331 out of 357, or 92 percent), followed by 238 households that own chickens. Only 93 household own goats, and 98 households own sheep. Donkeys are owned by 17 households and no one owns pigs. Similar distributions are found among female-headed households, although the percentage of women raising chicken and goats is slightly higher than for the rest of the sample. The average number of three goats or sheep (mean value) per farm shows that for smaller animals the herds are not as large as for cattle. The average size of a household cattle herd size is 5.4 heads (mean value). This distribution can be explained by the Kalenjin culture which promotes cattle raising as a means of attaining wealth and status. Owning goats and sheep are for '…poorer and less affluent people…' or just children (Idenya Interview) and is not considered as prestigious raising livestock. High cultural value is given to cows, but not to poultry or goats.

3.3.1 Herd set-up

The most common breeds amongst the interviewed households are Aryshire, Friesian and cross-breeds of each.

Table 4. Statistics on types of cattle

Statistics on types of cattle	Numbers						
	2. Bulls	**3. Oxen**	**4.a Milk cows**	**4.b Cows**	**5. Heifers**	**6. Female calves**	**7. Male calves**
# valid	68	43	298	89	147	222	172
# missing	289	314	59	268	210	135	185
Mean	1.28	1.67	2.43	1.72	1.67	1.33	1.22
Median	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Sum	**87**	**72**	**724**	**153**	**245**	**295**	**210**

The majority of farmers claimed to have pure-bred cattle. However, enumerators and EADD team colleagues assume that the majority of the breeds are actually crossed breeds, and that farmers are not aware of the exact genetic composition of their animals. The precise number of each of the cattle type and the respective breeds can be seen in the tables in Annex B and the *.sav* file.

In total, the 329 households possess 1 768 heads of cattle. On average one household owns 5.4 animals and the median is 4 animals per household. When deducting calves, the average size is 3.9 per household (median 3). The herds range from one animal up to 22 heads, although herds with more than 10 cattle are rather exceptional[4].

However, the data show that project participants possess on average 6.6 (median 6) heads per household and non-participants 4.6 (median 4) heads per household. A possible interpretation of these numbers could be that project participants generally own more cattle than non-participants. This is contrary to EADD approach, which is to decrease the herd size while improving overall yields.

One possible reason project participants have more cattle is that they use more artificial insemination and as a result have higher numbers of calves in the herd. However, calculations show that even after deducting calves from the herds, project participants own more cattle than non-participants. Other explanations might be that project

Picture 2. Livestock Division figures

participants are currently trying to improve the cattle they own before selling them for higher prices or were able to buy a new animal before selling others.

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[4] The national livestock statistics is summarized by Technoserve 'as follows 'Almost all Kenyan dairy statistics are only estimates, at best' (Technoserve 2008: 8) and shows the difficulties to compare the numbers found in this sample with numbers of national or official statistics.

According to the Livestock Division of Kaptumo (see picture 2) there are 24 000 heads of cattle in the division, with 3 000 pure exotic breeds, 14 200 crosses of exotic and 5 000 bulls (for beef production). Zebus are predominant in the southern part of the division, and none were recorded in the sample.

The table 5 below shows the respondents assessment of their own household economic situation (rows) and the number of cattle owned (columns).

Table 5. Assessment of economic situation and number of owned cattle

Assessment of economic situation of the household	Number of owned cattle (grouped)												Total	
	Up to 2		2 to 4		4 to 6		6 to 8		8 to 10		More than 10			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very poor, there is sometimes even not enough food available	3	5.2	1	1.0	0	.0	0	.0	0	.0	0	.0	4	1.2
Poor, but have no food problems and only sometimes problems buying clothes	16	27.6	21	21.6	9	13.2	5	10.6	1	3.7	0	.0	52	16.2
Moderate, enough money for food clothes, health care, school	39	67.2	69	71.1	47	69.1	38	80.9	19	70.4	16	66.7	228	71.0
Moderate, enough money even for some luxurious objects like motorbike, car, computer	0	.0	6	6.2	11	16.2	3	6.4	7	25.9	8	33.3	35	10.9
Good, can run a good car, own a good house, have many luxurious goods	0	.0	0	.0	1	1.5	1	2.1	0	.0	0	.0	2	.6
Total	58	100	97	100	68	100	47	100	27	100	24	100	321	100

Based on these findings, households considering themselves poor own smaller herds, generally less than four cows. Households considering themselves 'moderate', with enough money for basic expenditures (the majority of the sample), possess average size herds, between four and six cows. Interviewees who have herds with more than ten cows have a 'moderate' household situation. The sample therefore does not reflect a situation where a number of households are poor with only few cows on one hand and, on the other hand, rich households having many cows. Generally, it is a moderately wealthy sample that averages the same amount of cows across the different economic statuses.

EADD's objective is to assist farmers owning improved breeds to increase milk production. Farmers should reduce their herd size and work towards improving production with high-protein fodder and animal health services rather than having a bigger but less productive herd. From a farm productivity point of view, it is heartening to see that the majority of cattle are milk cows, which should enable farmers to increase their productivity and raise their income from selling milk.

More than two-thirds of all respondents keep their cattle predominantly on paddocks (63.9 percent). Less than a quarter keep them grazing on communal land (21.4 percent), and only 9.9 percent tether their animals. Few farmers said they had two locations for feeding their cattle, such as combining grazing with paddocks or tethering and paddocks. 252 households have at least one paddock; 170 households said they had two; 120 households had three; and 39 households had even four paddocks. Taken all paddocks together, the average size of land used as paddock is 0.95 acres (median 0.70) per interviewee.

Farmers who own larger than average paddocks (one acre), have an average herd size of 7.9 (median 7) animals, which they keep predominantly on paddocks. These cows produce on average 13.2 litres milk per day (median 13 litres), which is 1.7 litres (median 1.9 liters) per cow. Farmers who own less than one acre of land, own on average 4.8 cattle (median 4). The average amount of milk they produce is 9 litres (median 8), which is 1.9 litre per cow (median 2 litres). Although the differences are quite small for this sample, these figures could give an indication in future surveys about whether smaller land sizes will force farmers to reduce the number of cattle and/or change feeding practices because less grass is available.

None of the farmers mentioned having a zero-grazing unit or plan to have one. Observations in the field and impressions from focus groups show that the concept of zero-grazing units is known but only practiced by about 30 farmers in the entire Kaptumo Division. EADD is strongly promoting zero grazing, but it requires a relatively high investment from the farmers. The main costs involved are for the excavation of the ground. Poles and roofs can be produced with local goods, according to Mr. Idenya, head of the Livestock Division in Kaptumo. He also suggests that project participants could make use of the 'check-off' system, whereby participants could finance the units by paying off their loans with milk. In his opinion, EADD and the MICCA Programme could work together to promote zero grazing among the communities. As a next step, Idenya sees a 'community dairy farming system' in which cows from several farms are located in one big zero-grazing unit with farms merely producing fodder for the cattle. This would allow for an efficient use of manure (also for biogas) and enhance fodder production in the area. Possibilities for zero-grazing units might be a good entry point for the cooperation of the MICCA Programme and EADD given the potential imporved feed production has for climate-smart agriculture.

3.3.2 Milk production and usage

No significant differences were noted between the average amount of milk produced by different breeds. The milk of all mentioned breeds is sold equally. On average a milk cow produces 4.2 to 4.8 litres per day. The median amount is 4 or 5 litres per day.

Over half of all respondents gave at least one reason for variations in daily milk production. About one-third attributed the fluctuations to a cow's lactation period (37.6 percent). Other respondents attributed the fluctuations to the quantity and type of feed (32.2 percent) and another group to changes in weather and temperature (21 percent). Isolated cases said that an increase in milk production is caused by supplements and/or concentrates and that decreases are due to a lack of water. On one hand, it is obvious that farmers understand the need and the impact of improved feeding techniques for the well-being and production of their cattle. On the other hand, the number of households using or producing high-protein feeds is very low (This is presented in more detail later in the report). Farmers lack the required knowledge regarding better cropping techniques and crop selection to produce their own improved fodder. This knowledge gap could be filled by the MICCA Programme's support to EADD in identifying needs and finding possible ways to integrate climate-smart agriculture techniques.

Only 307 households gave a more detailed responses about the milk produced per day by all cows. Figures ranges from one litre up to 48 litres of milk, with a mean of 9.8 litres. A closer look at project participants (135 cases) and non-participants (172 cases) indicates that the average median value for project participants is three litres higher than the median amount produced by non-participants and two litres higher than the overall median average. Although the sample size represents only a small part of EADD participants, this is an encouraging result for the project.

Table 6. Overall amount of produced milk per day

Overall amount of produced milk per day (in litres)	PROJECT PARTICIPANTS	NON-PARTICIPANTS
N Valid	135	172
N Missing	0	49
Mean	11.5	8.4
Median	10.0	8.0
Minimum	1.5	1.0
Maximum	40.0	48.0
Sum	**1552.0**	**1453.0**

Graph 1 shows that the majority of households sell their milk and use the milk for their own consumption. Only four households reported that they did not consume the milk they produced. This could either be a mistake in data entry, an incorrect answer or the respondents may have been commercial farmers.

Graph 1. Use of milk
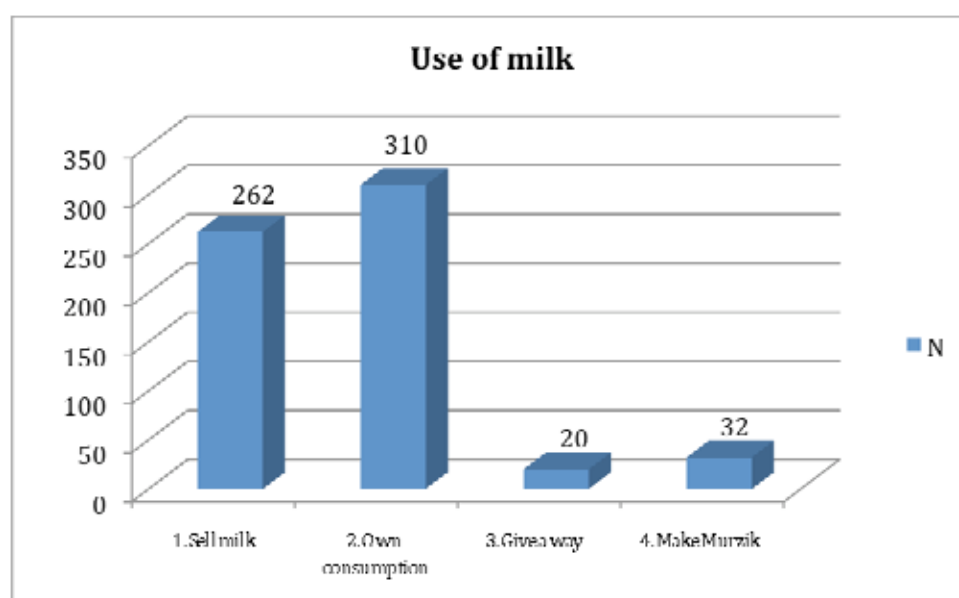
Only 10 percent of the respondents produce '*murzik*', a local beverage fermented in a closed container (gourd) and treated with a special aroma from plants for about a week. Focus group discussions and key informants emphasize that the shortage of milk caused by the increase in population and land scarcity does not allow farmers to continue the production of this traditional drink. As a result, *murzik* has become a rarity in the area. On average 7.2 litres are sold per day per household and 3.2 litres are kept for household consumption. Some households mentioned that they give milk away for free (about 1.5 litres per day).

Putting those numbers in relation to the overall milk per day available for the household, on average 66 percent (median) is sold and 33 percent (median) is consumed by household members. In 31 cases, household members consume 100 percent of their milk themselves and do not sell anything. There is no significant noticeable difference for female-headed households.

None of the households conserve milk in form of '*lala*' (another type of fermented milk) or yoghurt nor sell other dairy products. Apparently yoghurt is not common in the area due to the lack of electricity and the consequent storage difficulties. Although the climatic conditions would allow the

yoghurt production, one interviewee mentioned that he would not know where to get bacteria, or what to do with it.

Before the chilling plant was built, farmers sold less milk than the available supply. Several interview partners mentioned that, thanks to the chilling plant, they can sell all the milk they want and no longer need to discard any. This positive change is reflected in the differing income figures from milk sales for project participants and non-participants. For the overall sample, the monthly income from milk sales varies depending on the litres sold. On average 6 225 KSH are earned from milk sales, with a median value of 5 000 KSH per month.

Table 7 shows that the mean and median values for the monthly income from milk sales for project participants are higher than the values for the overall sample and for non-participants.

Table 7. Monthly income from milk sales (in KSH)

Monthly income from sold milk (in KSH)	PROJECT PARTICIPANTS	NON-PARTICIPANTS
N Valid	122	137
N Missing	13	84
Mean	6807	5745
Median	5860	4500
Minimum	840	400
Maximum	27000	30000
Sum	830405	786990

Although the figures for project participants are not much higher than the overall sample values (8.5 percent mean; 14.7 percent median), they are significantly higher than those of non-participants (15 percent mean; 23.2 percent median). Possible reasons for this difference are: the stable prices offered by the chilling plant; the fact that all milk can be transported and sold at the chilling plant with no milk discarded; changes in farm management (reducing herd sizes, changing fodder); and the use of animal health services provided by EADD.

A later chapter will present in more detail the household income and economic situation. The mean monthly income from the sale of milk (6 225 KSH) makes up 30 percent of the monthly household income (mean value). Taking the median values of 5 000 KSH of monthly income from milk sales, it makes up as much as 51 percent of the median monthly income in KSH (9 800 KSH).

Table 8. Ratio of balanced income and income from milk sales

Ratio of balanced income and income from sold milk	Monthly income from sold milk (in KSH) (mean) 6225	Monthly income from sold milk (in KSH) (median) 5000
Monthly balanced household income KSH (mean) 20172	30.9%	
Monthly balanced household income KSH (median) 9800		51.0%

Increasing the numbers of project participants would enable more farmers to share in the success of current project participants, so it would certainly be of interest for EADD and the MICCA Programme to support an increase in project participation. The percentage of milk sales as a part of the monthly household income could be seen as an indicator of improved livestock management and

demonstrate the possible positive impact on food security and the general socio-economic household situation.

It should also be noted that not all farmers sell their milk to the Kaptumo chilling plant or not exclusively to the plant. There are other chilling plants in the area that might be even more easily accessible than Kaptumo for some households. Others sell their milk in local or regional markets (see chapter 3.5) or to 'hawkers' who pick up the milk at the farm and take it to a more distant location. The hawkers do not necessarily have stable prices and do not pay in a reliable manner. In addition, the hawker's price is often lower than the one provided by the chilling plant. However, due to the poor transport and road infrastructure, not all farmers can easily reach the Kaptumo chilling plant and, therefore, depend on hawkers and smaller markets.

3.3.3 Feeds and fodder production

In focus group discussions, farmers revealed that most of the feeds used are of low quality. One reason given for this was the farmers' lack of knowledge regarding the production and storage of fodder. Another complaint farmers made was about a lack of seeds that would allow them to produce more maize and use the surplus yield or crop residues as feed. It also became apparent that cultural beliefs affect feeding practices. For example, many farmers consider that using crop residues for feed is bad for cattle. This also explains why more farmers are not producing their own fodder.

The majority of interviewed households feed their cattle with fresh grass without distinguishing between different types of cattle. As outlined above, animals are feed either on a paddock, tethered or left to graze on communal land. Six of the farmers interviewed have to buy fresh grass, as they do not produce enough themselves. They pay on average 205 KSH per week. Only one farmer stated that he required 150 kg of fresh grass per week per head. All the others respondents failed to estimate the required volume of grass feed.

Two-thirds of all farmers are feeding Napier grass (214 cases) to their cattle, and in 24 percent of those households only to milk cows. All households produce their Napier grass themselves and do not need to buy it. Only 175 farmers were able to estimate the required amount of Napier grass for their cattle. Volumes are given in bucket-loads, wheel barrows, sacks and kg. Those units were converted into kg based on figures provided by the local assistant and ILRI (see Annex C). On average 224 kg of Napier grass per household are required for all their cattle per week (median 120 kg). The majority uses between 50 and 300 kg; volumes below and above that are exceptional.

One-third of all farmers feed their animals crop residues; the majority to all cattle, and only 2.8 percent to milk cows. The ratio[5] is very low and does not exceed 20 percent of the daily fodder ratio. The average is around 9 percent. Only two households buy crop residues, paying 100 KSH and 750 KSH per week for this. Although only a small percentage in this sample uses crop residues as feed, at least there is an awareness of the possible positive impact crop residues can have on milk production.

Only one-quarter of the interviewed households feed concentrates to their cows. Half of this group reports feeding concentrates to all their cows, whereas the other half only feeds high-protein concentrates to milk cows. A small number (4 percent) of farmers produce the concentrate themselves (using molasses and sweet potato vines or dairy meal and maize). Farmers spend between 25 KSH and 3 000 KSH on concentrates per week and on average 380 KSH (median 150 KSH).

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[5] Unfortunately, only a few households and/or enumerators understood the need to evaluate the daily ratio of the single fodder components. Therefore, the given answers are rather low and can only be understood as trends.

Three-quarters of the farmers feed supplements (salts and minerals) to their cattle. The ratio in the daily fodder scheme is very low, with 1 or 2 percent as the main percentage indicated. Supplements are explicitly fed to milk cows. In one case, the supplements were also given to a heifer. The required amount per cattle per week is on average 1.3 kg. In all cases, the supplements have to be bought. Costs range between 8 and 600 KSH, with a mean price of 132 KSH.

To summarize the different feeding systems, the main feeds are fresh grass and Napier grass, which are high in protein, but not high enough to improve the milk quantity and quality, according to EADD staff and other livestock experts in the area. The positive impact of feeding concentrates, supplements and crop residues are visible, and these feeding practices should be reinforced by the project.

The number of households producing high-protein crops like Lucerne and Dismodium is expected to increase during future project phases. Practices, such as drying crop residues and pulverizing them to produce concentrates are currently not common, but they could be an entry point for cooperation between the MICCA Programme and EADD.

Interviewees gave many reasons for not producing their own cattle fodder. Insufficient land to plant fodder crops (55.5 percent) is the main reason, followed by lack of finances (27 percent) and lack of knowledge (8.8 percent) concerning cropping techniques and crop selection. Only a few interviewees (8.8 percent) said that they did not see the necessity of fodder production at all. This shows the widespread awareness among the population about the need to improve fodder production and the willingness to learn about it. This offers an excellent opportunity for the MICCA Programme to promote climate-smart agriculture practices to produce more and improved fodder crops as well as crops whose residues can be used to produce dried concentrates. Intensive training should be developed to work with farmers on adequate crop selection, cultivation and processing to achieve the desired increases in milk production.

In addition to improved feed management, another way to improve dairy production is through cattle breeding using artificial insemination with improved semen. EADD is offering artificial insemination services and has seen a steep increase in the use of these services. 84 households said they had used artificial insemination over the last 12 months; about two thirds have tried it once, and 21 percent twice.

3.3.4 Manure management

Manure management is an essential element in climate change mitigation and a possible focus area for future cooperation between the MICCA Programme and EADD. Manure can be used to fertilize soils and enhance fodder crop production or the production of crops whose residues can be used for fodder. In addition, manure is a producer of greenhouse gases, methane and nitrous oxide. It is also a health and water quality hazard. Improper manure management is harmful to community well-being and contributes to climate change.

Graph 2. Use of manure
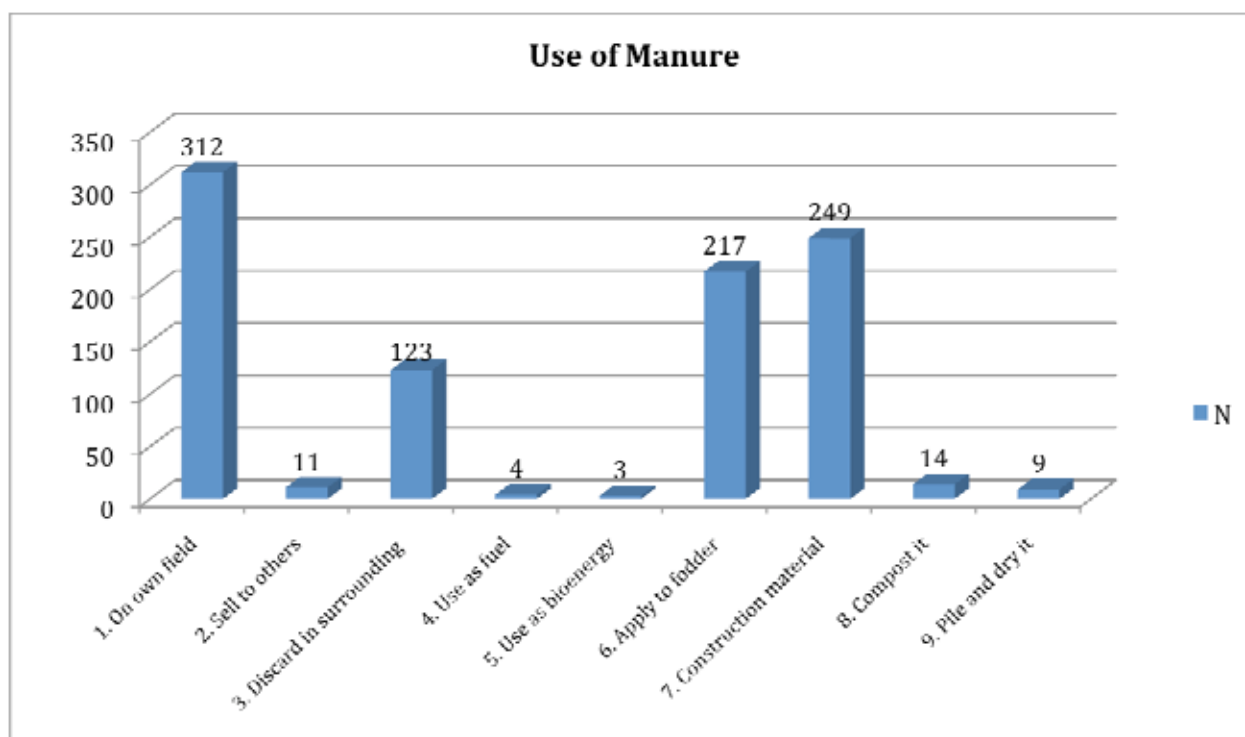
Graph 2 shows that the majority of farmers use manure on their own field (312 cases, 87 percent). A substantial number even apply it to fodder crops. At the same time, more than one-third of the farmers discard the manure in the surrounding area. About three-quarters use the manure as construction material, predominantly for animal shelters (see picture 3).

In only a few cases is manure used as fuel, biogas or compost. The use of manure as an alternative energy resource is not common. However, its use as fertilizer is known to more than two-thirds of the interviewed households. In focus group discussions, the idea was raised to use manure as fuel for fires to reduce the deforestation in the area. Participants shared the view that they lack the knowledge about which crops they should and could apply manure to improve production.

Picture 3. Manure used as construction material

Because livestock is kept in paddocks or sent to graze on communal land, manure cannot be collected easily and reused for other purposes. Rain washes away substantial amounts of manure, making it impossible to collect. From a manure management point of view, the current predominant way of keeping cattle (on paddocks) clearly makes an efficient and adequate use of manure difficult. Assisting farmers with manure management and promoting on-farm fodder and crop production through improved manure management could be another important entry point for the MICCA Programme. Zero grazing could be one approach for achieving better manure management.

3.4 Cropping

3.4.1 Types of agricultural practices

Except for four households, all interviewees practice some form of cropping. The majority of the 354 households interviewed cultivate on their own fields. Less than 8 percent cultivate on leased fields. About one-third cultivate a single main plot, while another third cultivates several fields. Horticulture and gardening is very common (81.3 percent). Planting and harvesting trees is practiced by only one-third of the households interviewed. Harvesting bushes and fruit is done by only 13.6 percent of the households. The majority of farmers produce food for their own consumption and have some surplus food to sell. Only 12 households practice subsistence farming.

There were many different responses given to questions about agricultural problems. The most frequently cited problems are diseases (34.7 percent) followed by lack of seeds (19.2 percent). During farm visits and interviews with farmer groups, it was apparent that the last seed order/distribution was covered with a fungus that caused low maize yield and damaged the soil. In focus groups, the team learned that farmers still use those infected crops as fodder for their cattle, which constitutes a major health hazard.

Farmers mentioned that access to water for animals and people can be a problem. Apparently, incidences of water-borne diseases are high and access to safe water is low. In addition, cattle watering along the river side and cattle tracks leading to and from the water sources are causing soil erosion. According to some focus group discussion participants, the topsoil is decreasing and overstocking is causing less grass to grow.

Farmers also complain about expensive inputs, such as fertilizers and equipment (9.4 percent). A lack of knowledge and training in areas such as improved farming techniques and crop selections was mentioned by 7.8 percent of the interviewees. Lack of finances (5.3 percent), low yields (3.9 percent) and lack of market access (3.4 percent) were some of the other problems mentioned. Problems related to weather (changes in weather, hailstorms, more rain and natural calamities) accounted for 5 percent of the responses. This leads to the conclusion that climate variability is considered a problem, but is perceived as a relatively small issue. More striking problems are connected to diseases and crop quality.

3.4.2 Climate-smart agriculture

About 90 percent of all interviewees stated they knew about conservation agriculture. Often enumerators had to explain the term by outlining different cropping techniques with farmers then confirming whether or not they practice them. Most common of theses practices are ridge cultivation (93.8 percent), planting in rows (91.0 percent), planting hedge rows (91.2 percent), application of manure (90.4 percent), crop rotation (83.9 percent) and timely weeding (80.7 percent). Almost all interviewees stated they applied fertilizer on their fields. The question was intended to refer to organic fertilizer, but given the high response rate, we have to assume that many respondents understood that the question referred to the application of chemical/inorganic fertilizer. It is worth noting the high prevalence of sustainable and climate-smart agriculture practices common in the area. There is a general openness to climate-smart agriculture, which represents another entry point for the MICCA Programme.

Graph 3. Techniques most beneficial to cropping and livestock

Techniques most beneficial to Cropping and Livestock
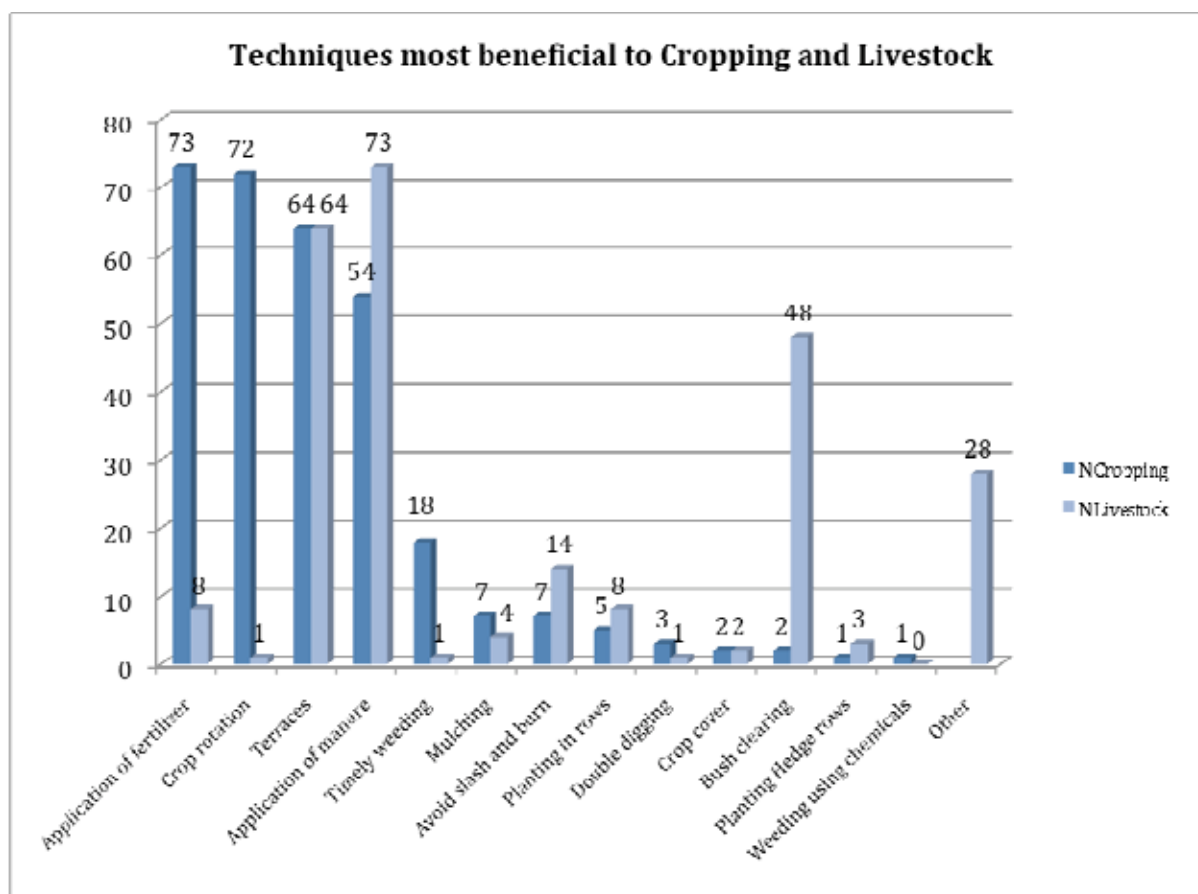
The most beneficial techniques for cropping and raising livestock are also the techniques practiced by most of the interviewees. Planting hedge rows is practiced by 91.2 percent of the interviewees. However, this practice is not considered to be very beneficial (It was only mentioned in a single case as being beneficial for cropping or livestock). In terms of techniques that benefit livestock, the application of manure is the most given answer. This can be explained by the fact that manure is applied to the Napier grass that the farmers cultivate themselves and possibly to crops whose residues are used as fodder.

Terraces can be beneficial because fodder, like Napier grass can then be planted along slopes and other fodder plants are not washed away by rains. Other techniques that could enhance fodder production, such as cover crops, double digging or crop rotation are not considered very beneficial for raising livestock.

The most important finding is that cropping techniques that can be considered as climate-smart are commonly practiced in the project area. The general openness for and use of such techniques among the population is a good entry point for the MICCA Programme, which would be able to build on existing practices and expertise. Project interventions would not have to start from scratch, but could emphasize the benefits and impacts of existing practices when combined other techniques currently still 'unpopular'. In almost half of the cases, the father of the family decided to use these practices, and in a quarter of cases the mother. Men as well as women should be considered as household decision makers, and both men and women should be considered in any project interventions.

3.4.3 Crop production

All farmers engaged in cropping plant a broad variety of crops; 279 households plant up to 6 types of crops, 33 households have up to seven crops, and seven households cultivate eight different types of

crops. Maize is the predominant crop, (planted by 23.2 percent of all interviewees), followed by beans (14.9 percent), bananas (12.2 percent) and tea (12.1 percent). Napier grass is planted by 7.8 percent of all interviewees. However, enumerators in the first few days did not note when respondents said they planted grasses. From previous figures, we know we know that at least 214 households are feeding Napier grass to their cattle and produce it themselves. This is exactly double the numbers of responses to this question. In addition, vegetables (6.5 percent), avocados (6.3 percent) and potatoes (4.6 percent) are also relatively common. Other crops, cultivated by fewer households, are cabbages and kales, guava and passion fruits, yams and sweet potatoes, sugar cane, coffee and sorghum.

For each of the given crops the farmer estimated the plot size. At this point, it would be difficult to present the average plot sizes for each crop. This information can be extracted from the respective data table in annex B and might be valuable for emission calculations or other analyses. For evaluations in the coming years, rather than calculating the exact sizes of the different plots, it might be more worthwhile to see whether there have been changes in the crop selection, whether more crops or their residues are being used for fodder, and whether farmers decided to plant more resilient crops. Adding up all the plots used for the different crops, the survey found that 769.90 acres are being used for cropping activities by all farmers. The average size being cultivated by a farmer is 2.2 acres (median 1.5 acres), ranging from 0.03 to 20.59 acres.

The graphs below shows the different types of crops being treated with manure, inorganic fertilizer, pesticides and herbicides. The team leader and assistant explained the differences between these inputs to the respondents several times. Based on the high responses given for herbicides and pesticides, we have to assume that enumerators as well as interviewees are not fully aware of the difference.

Graph 4a. Inputs applied to crops (1)
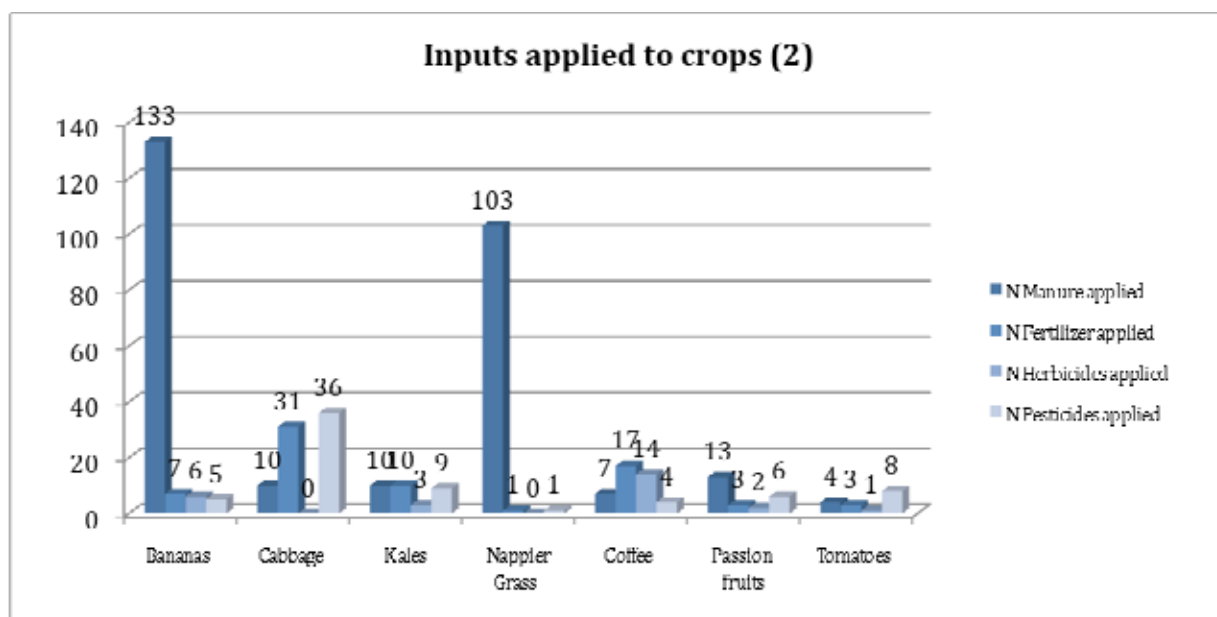
From graphs 4a and 4b it can be seen that manure is mainly applied to Napier grass and bananas, whereas fertilizer and other inorganic matter is mostly applied to maize and tea, the two predominant cash crops in the area. Avocados, tomatoes, passion fruits, coffee, kales, onion and potatoes are treated less often with inputs than others.

Except for Napier grass, all the other crops are marketed. The data show that all the tea produced is sold, whereas for most other crops, a portion is used for household consumption before selling the surplus.

Looking at the revenues from all crop sales, the average annnual income is between 25 000 KSH and 50 000 KSH per crop. Most revenues are generated from maize, tea, banana and bean production. Adding up all revenues from these crops, a household can make on average 212 020 KSH (median 62 000 KSH) per year by selling crops. In the sample, the minimum amount a household generated annually from crop production was 500 KSH and 6 027 700 KSH the maximum. For more detailed tables see. Annex B.

As mentioned in an earlier paragraph, the yields for project participants are higher than for non-participants. This is also reflected in the income figures generated by crop sales.

Table 9. All annual revenue from all crops sales (in KSH)

All annual revenue from all sold crops (KSH)	PROJECT PARTICIPANTS	NON-PARTICIPANTS
Valid	127	204
Missing	8	17
Mean	338 989	133 910
Median	83 000	55 550
Minimum	1500	500
Maximum	6027700	2023500
Sum	43051542	27317520

The mean average income from crop sales for project participants is almost 40 percent higher than the sample average and 2.5 times higher than the mean average for non-participants. Looking at median values, the difference is about 25 percent between the sample average and the average for

project participants, and 33 percent between project participants and non-participants. Although EADD is not yet extensively promoting conservation agriculture or agricultural techniques in general, this is a noteworthy point. The differences could be explained by the fact that project participants have become more market oriented since joining the project and can afford more inputs due to increased income from milk. As a result they can generate higher yields than non-participants. Although the absolute numbers have to be treated with caution due to small sample sizes, it is still a significant difference.

About one-third of all interviewees also produce other agricultural goods including, eggs (48.7 percent), honey (19.2 percent), chicken (20 percent), sheep and goats (each 5 percent). In most cases, the livestock is kept on the farm and sold or slaughtered. Honey and eggs are also sold. The overall annual revenue from such additional goods averages 9 143 KSH (median 6 000 KSH). Only 10 percent of the respondents earn more than 20 000 KSH.

3.4.4 Tree planting

More than three-quarters (79 percent) of interviewed farmers said they planted or protected trees. Some of the households planted and protected several types of trees over the last 12 months. Details are given in the table below.

Table 10. All type of tree(s) planted

All type of tree(s) planted	Frequency	Percent
Cypress	92	17.5
Gravelia / *Grevillea*	18	3.4
Nandi Flame	16	3.0
Indigenous Trees	193	36.8
Fruit trees	1	.2
Eucalyptus / Blue gum	184	35.1
Avocado	4	.8
Bottle brush	12	2.3
Pinus	2	.4
Mahogany	1	.2
Jacaranda	2	.4
Total	525	100.0

The list in table 10 shows that the majority of trees planted are considered indigenous trees and Eucalyptus (Blue Gum). The latter is a tree which requires a great deal of water. It should be assessed as to how appropriate it is to plant this type of tree in the area, and whether alternatives can be found and promoted. A list of trees that interviewees and enumerators considered 'indigenous' can be found in Annex D. The list could be revised by ICRAF to provide more detailed information about each species, their potential as fodder trees and their general environmental sustainability.

Over the last 12 months, 205 respondents planted on average 118 trees (median 30). A total of 24 130 trees were planted. The minimum number stated was one, and the maximum was 3 000.

Table 11. Number of trees

Number of Trees	All planted trees		All protected trees	
	N	**%**	**N**	**%**
Up to 5	24	11.7	43	34.7
6 to 10	25	12.2	24	19.4
11 to 25	50	24.4	19	15.3
26 to 50	35	17.1	16	12.9
51 to 100	28	13.7	7	5.6
101 to 200	25	12.2	11	8.9
More than 200	18	8.8	4	3.2
Total	205	100.0	124	100.0

The table shows that fewer interviewees protected trees (about a third of interviewees) during the last 12 months. By under protection, we do not consider maintaining and nursing newly planted trees, but deliberately protecting trees by informing or prohibiting others from cutting down trees or branches. Respondents on average protected 40 trees (median 10). The minimum number given was one and the maximum was 600. The overall number of protected trees is 4 917.

Even though a high number of people are already planting trees, 71 respondents said they are willing to begin planting or protecting trees in the future. If this is correct, then almost everyone who stated they were not planting or protecting trees yet, would begin doing so in the future.

For the MICCA Programme it is heartening to see such a high number of the sampled households already planting and protecting trees. Building upon farmers' willingness and awareness of agroforestry practices is a necessary prerequisite for introducing different types of trees that are both beneficial as fodder trees and contribute to climate change mitigation.

3.5 Markets, labour and food security

Kaptumo is very well connected by major roads to important urban and economic centers, including Eldoret in the north-east and Kisumu in the south-west. Other regional markets are in Nandi Hills, Kakamega, Kabsabet (a list of all mentioned markets are in Annex B). As mentioned above, some of the locations linked to the Kaptumo EADD site suffer from a lack of public transport and weak road infrastructure, especially during rains. This reduces access to markets and requires farmers to spend more time getting to markets. Although the MICCA Programme might not be able to affect the market situation in the area, it is still important to analyse current market accessibility and future potential.

As outlined in chapter 3.4, all crops mentioned are marketed. In addition to crops, respondents sold milk (17.9 percent) and eggs (4.25 percent) at markets. However, markets where cattle and other livestock are sold were mentioned in the sample. Depending on the goods and the location of the market, the frequency of market visits varies. In most cases, the interviewed farmers go to the markets themselves, whereas about half of the times goods are sent through a middle man.

3.5.1 Visited markets

Overall, 333 Households sell at least one type of agricultural product at a market; 239 household can sell up to two goods, 131 household sell three and 35 households sell four goods. On average, the distance to market is between four and six km. In only a few cases, did the distance exceed more than 20 km. Considering frequency and distance in relation to each other, it becomes obvious that

markets visited daily or once a week are closer than those visited once or twice a year. The mode of transport varies depending on the distance between house and market (see table 12). The majority of farmers interviewed use a motorcycle or go by foot. It is striking that only a few households use donkey carts or bicycles.

Table 12. Mode of transport to market

36. Distance both ways to market (in km)	Mode of transport to market													Total	
	Foot		Bicycle		Motorcycle		Car		Minibus		Truck		Donkey cart			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Up to 0.5	25	30.5	0	.0	1	.9	1	1.3	0	.0	1	7.1	0	.0	28	9.4
0.51 to 1	25	30.5	0	.0	6	5.6	4	5.2	0	.0	1	7.1	1	11.1	37	12.4
1.01 to 2	14	17.1	1	11.1	8	7.5	2	2.6	0	.0	2	14.3	1	11.1	28	9.4
2.01 to 4	10	12.2	4	44.4	22	20.6	7	9.1	0	.0	2	14.3	1	11.1	46	15.4
4.01 to 6	8	9.8	4	44.4	14	13.1	8	10.4	0	.0	1	7.1	3	33.3	38	12.7
6.01 to 8	0	.0	0	.0	32	29.9	9	11.7	0	.0	0	.0	1	11.1	42	14.0
8.01 to 10	0	.0	0	.0	15	14.0	19	24.7	0	.0	1	7.1	1	11.1	36	12.0
10.01 to 20	0	.0	0	.0	8	7.5	14	18.2	1	100.0	4	28.6	1	11.1	28	9.4
More than 20	0	.0	0	.0	1	.9	13	16.9	0	.0	2	14.3	0	.0	16	5.4
Total	82	100	9	100	107	100	77	100	1	100	14	100	9	100	299	100

All planted crops are sold on markets. Bananas, beans, maize, teas and vegetables are the most commonly sold crops[6].

In summary, the majority of interviewed households have access to markets that they visit with varying frequency. In general, farmers either walk or use motorcycles to reach the markets and have to travel on average four to six km. Only few households have to travel further than 20 km to sell their goods. These figures confirm the generally good market access in Kaptumo.

3.5.2 Required on-farm labour

More than one-third of respondents needed to hire labour during the last 12 months. Only 14 farms hired permanent female staff (on average 1.9 women; median 1.5 women), whereas 63 farms hired male permanent staff (on average 1.25 men; median 1 man). Female permanent staff are predominantly hired for picking tea (79.1 percent), whereas men are hired predominantly for herding (63.5 percent). Other tasks for men include, picking tea, weeding and general farm activities. More farms hired casual labour over the last 12 months. Forty-two farms hired female casual labour for an average of 230 days per year (median 156 days per year). This could be either one person or several working this number of days. Again, women are hired for picking tea and some for weeding and planting.

Men as casual labour were hired on 72 farms over the last 12 months. The average amount of days is the same as for women (230 days/year; median 120 days). The main task is picking tea. Additional tasks done by casual male labour include, weeding, digging, picking coffee and harvesting.

It is reassuring to see that none of the farmers had hired, either on a permanent basis or as causal labour, girls or boys younger than 14 years old. This indicates that in general the demand for

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[6] 15 households said they sold produce from their homestead; therefore 'home' is considered a market as well.

additional labour is for tea plantations and livestock herding. The work load or demand for additional staff for cropping tasks seems rather low.

3.5.3 Food security

About 80 percent of all interviewees stated they were able to provide food for their household primarily from their own production. Only two households were never able to provide food for their families. All the others were sometimes able to provide food from their own production. These numbers confirm findings in chapter 3.4 indicating that the majority of respondents produce agricultural goods for their own consumption and sell the surplus.

Table 13. Number of months able to provide food from own farm

Number of months able to provide food from own farm	Frequency	Percent	Valid Percent
1-3 months per year	14	3.9	4.0
Up to 6 months per year	35	9.8	9.9
Up to 9 months per year	66	18.5	18.6
The whole year	142	39.8	40.1
Even more than a year	1	.3	.3
Very irregular	96	26.9	27.1
Total	354	99.2	100.0

The table shows that the area must be somewhat affluent with 40 percent of respondents able provide food for the whole year and about one-third able to provide food for up to six or nine months. On the other hand, a third of households can only provide food on an irregular basis from their own production.

To be able to provide food all year round, a system for storing food (or fodder) is essential. About two-thirds of interviewees store food or fodder. The majority use wooden granaries as shown in picture 4. About one-third of all farmers store food, and one-quarter store both food and fodder. On average, storage capacity varies between 3 510 kg to 3 913 kg. The MICCA Programme would like to see storage capacity increase further. Increased food storage capacity would help ensure food security, and more storage for fodder crops and dried fodder might encourage farmers to produce more fodder on-farm.

Picture 4: Wooden granary

3.6 Project participation

3.6.1 Project participants in the sample

More than one-third (136 cases, 37.9 percent) of the respondents participate in some project activities. Only 25 female-headed households (from 59 cases) participate in the project. The survey team agreed to consider farmers as participants if they participate in at least one activity or intervention by EADD, are share holders or supply milk.

The most common type of involvement in the project is supplying milk to the chilling plant in Ndurio or the collection center in Kaptumo (31.7 percent). Households either bring their milk to the DFBA themselves or the milk is picked up by the DFBA. Registered farmers at the chilling plant make up 20 percent of the survey sample. Farmers who participated in training session account for 17 percent. Rather low numbers are present of shareholders with the DFBA (4.2 percent). Farmers who participated in awareness campaigns represented 3.6 percent of the sample and farmers who used artificial insemination services 2.2 percent. The fact that the latter service is rather new in Kaptumo may explain the low number. In other interviews, farmers complained that the service is not very reliable as one person has to serve a wide area, often has no transport and frequently arrives too late to tend to the animal. Only four people had participated in workshops; two in exchange and learning visits. No extension worker was included in the sample. On average, farmers are involved in two activities; about one-quarter take part in three; and one household participated in six activities. The earliest participation dates back to September and November 2009, but the majority joined at the beginning of 2011.

Surprisingly, only one person made use of 'check-off' system, where by milk production is used to pay off loans. This low number may present a distorted view of the situation or the question might have been misunderstood by interview partners. From other interviews and other answers in the questionnaire, it is known that many of the project beneficiaries value the possibility of having access to loans, advance payment for their production and the ability to purchase certain goods or pay bills (e.g. school fees) with the assistance of the chilling plant. See more on this in next chapter.

Table 14 shows that farmers participating in the project predominantly consider their economic household situation as 'moderate' with enough money for basic expenditures. Poor households and more affluent households are less represented amongst project participants.

Table 14. Economic household situation and activities in project

Assess economic situation of the household	Number of different activities/participations in project												Total	
	1.00		2.00		3.00		4.00		5.00		6.00			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very poor, there is sometimes even not enough food available	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0
Poor, but have no food problems and only sometimes problems buying clothes	2	6.5	9	13.6	3	10.7	0	.0	0	.0	0	.0	14	10.5
Moderate, enough money for food clothes, health care, school	23	74.2	44	66.7	23	82.1	1	33.3	4	100.0	1	100.0	96	72.2
Moderate, enough money even for some luxurious objects like motorbikes, car, computer	6	19.4	13	19.7	2	7.1	2	66.7	0	.0	0	.0	23	17.3
Good, can run a good car, own a good house, have many luxurious objects	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0

Total		31	100	66	100	28	100	3	100	4	100	1	100	133	100

For EADD and the MICCA Programme it is noteworthy that none of the six very poor households in the sample are project participants, and only 14 households out of 57 households that consider themselves as poor are participating in the project. There are two possible reasons for this: (i) the project is so successful that farmers who participate in the project do not consider themselves poor anymore or (ii) poor households cannot afford cattle and so do not produce milk, making them ineligible to participate in the project. Given that the MICCA Programme focuses on contributing to food security, this is an important aspect that requires further research.

In half of all households (135) a man made the decision to join the project. About one-third of the decisions were made by female members of the house. In the other cases, the decision was made by men and women together. Consequently any intervention planned by the MICCA Programme would need to address women and men equally as both are decision makers on household level.

Based on responses from the household questionnaire and focus groups, the main reasons for joining the project are price stability and increased pay, both of which lead to higher incomes. Only a few respondents joined the project for access to better animal breeds or farm services. Due to awareness raising activities and specific MICCA Programme training sessions focusing on climate-smart agricultural practices, fodder production and manure management may also be reasons why farmers want to join the project.

3.6.2 Investments and current costs

When asked about the initial investments for joining the project, only 126 interviewees gave a repsonse. Almost three-quarters had initial investment costs, whereas a third did not have any expenditures.

Table 15. Investments and costs (in KSH)

Investments and costs (in KSH)	Initial investment								Total	
	Membership fee		Share		Registration fee		Purchase of animals			
	N	%	N	%	N	%	N	%	N	%
100	48	78.7	0	.0	15	83.3	0	.0	63	70.0
200	1	1.6	0	.0	0	.0	0	.0	1	1.1
500	3	4.9	0	.0	0	.0	0	.0	3	3.3
800	0	.0	0	.0	1	5.6	0	.0	1	1.1
1000	9	14.8	7	77.8	1	5.6	0	.0	17	18.9
1100	0	.0	2	22.2	1	5.6	0	.0	3	3.3
16000	0	.0	0	.0	0	.0	1	50.0	1	1.1
26000	0	.0	0	.0	0	.0	1	50.0	1	1.1
Total	61	100.0	9	100.0	18	100.0	2	100.0	90	100.0

Table 15 shows that the majority of respondents spent money on shares, membership fees and registration fees. Very few houses had to purchase animals, equipment or land. Taking all initial payments into account, households made initial investments of 3 480 KSH (median 100 KSH). The big difference between median and mean can be explained by the fact that the majority of expenditures were allocated to registration fees (one-time payment of 100 KSH). In addition, other expenditures are primarily EADD-related investments, such as the registration fees, equipment for cattle and veterinary services, and not necessarily an indicator for investments required for climate-smart agriculture.

EADD offers participants the possibility to become a shareholder in the DFBA of Kaptumo chilling plant, with the standard price set at 1 000 KSH. A one-time membership/registration fee of 100 KSH also needs to be paid to access certain services. However, farmers who only supply their milk to the DFBA do not necessarily need to pay a registration fee. The statistics on memberships or shareholders do not accurately reflect how many farmers are actually supplying milk, as they omit unregistered milk suppliers. A more reliable figure on milk suppliers is provided by the monthly payment books/cards managed by the DFBA staff.

Expenditures for animals (between 18 000 and 26 000 KSH), equipment (20 000 KSH) and land (150 000 KSH) has been necessary only for single households. Those expenditures are also not necessarily used for climate-smart agriculture activities. None of the interviewees explicitly said they spent money on equipment for activities to increase fodder production, plant trees, etc.

More than half of the project participants (65 cases) have regular ongoing costs. Three out of 65 households have to pay for labour (between 5 000 and 18 000 KSH per year); six have additional costs for equipment (350 to 2 400 KSH); seven have additional costs for other resources, like drugs and fodder (4 000 to 24 000 KSH); and 13 farmers now pay for veterinary services (200 to 15 000 KSH) on a regular annual basis. 56 households declared that they require more time for agricultural work now; on average 349 hours per year (median 365 h per year) with a minimum of twelve hours per year up to 1 095 hours per year.

The overall amount of ongoing costs (excluding shares, membership fees and additional time) could only be calculated for 21 cases (The majority of the 65 cases only mentioned the need additional time but no fiscal expenses). These ongoing costs average 8 588 KSH (median 5 000 KSH) and range from 350 KSH to 39 700 KSH per year. These costs represent 3.5 percent of the balanced annual household income (0.4 percent of the median annual household income) – a relatively low additional costs for the household.

Again, the main expenditures are allocated to livestock related issues including veterinary services, drugs, fodder and labour (to herd or milk the animals). No significant conclusion can be drawn in regard to expenditures for climate-smart agriculture, as they are mostly EADD- and livestock-related costs.

3.6.3 Evaluation of project and benefits

Almost 90 percent of all project participants see more benefits in project participation than disadvantages. Seven percent see the benefits and disadvantages evenly balanced, and only 3.9 percent of the respondents see more disadvantages.

The main benefits mentioned were access to loans (37.3 percent), followed by improved income (24 percent) and reliable pay (15.7 percent). The two latter aspects are similar to responses given regarding the reasons for joining the project. One can conclude that participants' expectations when they joined the project have been realized, and that benefits continue to be perceived. Other livestock-related answers regarding benefits, such as access to artificial insemination, transport of milk, better markets for milk and improved animal health were given by individual households. A benefit mentioned by 4.1 percent of the respondents was training and gaining knowledge. This could be an entry point to build on for the MICCA Programme in its ongoing cooperation with EADD.

The disadvantages are seen as less-than-expected payments and milk rejection. Others gave personal reasons. Overall only ten famers mentioned disadvantages.

Since joining the project, three-quarters of the interviewed project participants have seen an increase in their income. The main reason for the increase is additional milk production (82.3

percent) and generally healthier more productive animals (15.2 percent). Project participation led to an additional average annual income of 7 243 KSH (median 3 560 KSH) for 75 households. This minimum increase was 1 000 KSH, and the maximum was 36 000 KSH per year. The detailed distribution of income from additional sources of income is outlined below:

Table 16. Additional income due to additional source of income

| Additional income in KSH in last 12 months for type 1 | First type of additional income / business | | | | | | | | Total | |
| | Healthier animals | | Additional milk | | Higher price per liter milk | | Selling clothes | | | |
	N	%	N	%	N	%	N	%	N	%
Up to 1500	4	33.3	7	11.5	0	.0	0	.0	11	14.7
1501 to 2000	1	8.3	11	18.0	0	.0	0	.0	12	16.0
2001 to 3000	2	16.7	11	18.0	0	.0	0	.0	13	17.3
3001 to 4000	2	16.7	8	13.1	0	.0	0	.0	10	13.3
4001 to 8000	0	.0	9	14.8	1	100.0	0	.0	10	13.3
8001 to 12000	2	16.7	3	4.9	0	.0	0	.0	5	6.7
More than 12000	1	8.3	12	19.7	0	.0	1	100.0	14	18.7
Total	12	100.0	61	100.0	1	100.0	1	100.0	75	100.0

3.7 Non-participants

Based on the numbers above, 135 households consider themselves as project participants, with 222 households not participating in any EADD imitative and not supplying milk to the chilling plant. As some interview partners often did not necessarily know how to respond, the overall sample size of non-participants is reduced for some questions.

3.7.1 Reasons for non-participation

In half of the cases, the father made the decision not to join the project. In about one-third of the households, women made the decision. In less than 10 percent of the households, the decision was made jointly by men and women. The remaining households either did not know who made the decision or were not informed about the project, so did not have to make a decision.

The main reasons farmers gave for not participating in the project was lack of sufficient quantities of milk (40.3 percent) and lack the required knowledge and training about the project or livestock breeding (23.7 percent). Almost 10 percent of non-participants do not have any cows. Single cases mentioned delayed payments, lack of finances, project costs (either the membership fee or the share) and personal reasons. Apparently, initiatives like the chilling plant had failed in the past (even the DFBA reports this). Some farmers are afraid that the project will also fail and are hesitant to join. Another complaint expressed is that a large share of the milk price is taken by Savings and Credit Co-operative Society (SACCO)[7] which reduces farmers' income.

As indicated above, project costs are rather low. There may have been misunderstandings and rumors that created the impression of exaggerated participation costs. To avoid such misconceptions, more awareness raising activities may be required highlighting the actual costs of joining the project and describing the possible benefits and additional revenue.

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[7] SACCO is cooperatve that offer loans and micro-credit facilities to their members. Farmers use those facilities to ask for loans and pay off school fees, health services and the like. The DFBA works as a guarantor by offering the 'check-off', meaning farmers can pay off their loans with produced milk.

3.7.2 Requirements and willingness to join

Many diverse answers were given about farmers' needs before joining the project.

Graph 5. Requirements to join project
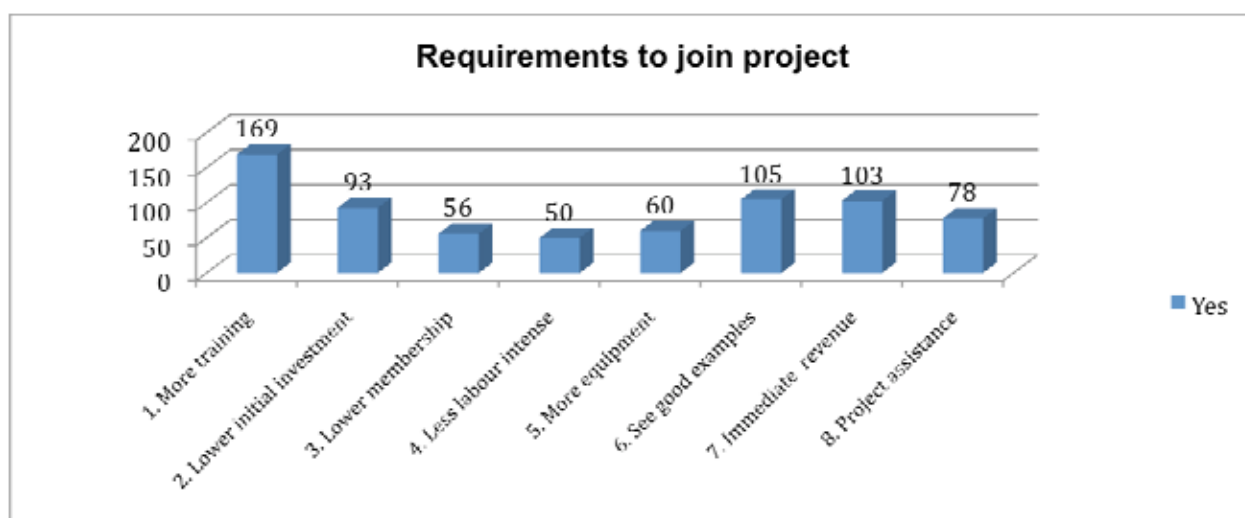
Graph 5 shows that the main requirement farmers requested to join the project was more training; demonstration of successful examples; assurances of immediate and direct benefits and revenue; lower costs of initial investments; and generally more assistance from the project. Aspects regarding labour and equipment were not as important. This graph and other given answers show that finances are the main issue in this area. Farmers want to invest less and see direct results.

When asked about their willingness to invest to improve agricultural yields, the majority of farmers said they would be willing to invest on average 13 860 KSH as a one-time investment (median 4 000 KSH). The minimum amount was 200 KSH and the maximum 200 000 KSH. A Comparison of this number with the actual investment required to join the project indicates that farmers would be willing to spend almost 4 times the average amount actually required as an investment when joining the project (taking the mean amount it is 40 times more).

Table 17. Ratio of investments willing to make (in KSH)

Ratio of investments willing to make (in KSH)		Investment willing to make (mean) 13860	Investment willing to make (median) 4000
Investment for project participation (mean) (by project participants)	3480	398%	
Investment for project participation (median) (by project participants)	100		4000%
Annual balanced hh income KSH (mean)	242062	5.7%	
Annual balanced hh income KSH (median)	117600		3.4%
Annual ongoing costs (mean)	8588	161.4%	
Annual ongoing costs (median)	500		800%

In relation to the average household income (balanced), the amount farmers would be willing to invest represents 5.7 percent of the average annual income (mean) and 3.4 percent of the median

annual household income. The investment households are willing to pay could also cover the annual average ongoing costs of 8 588 KSH (500 median) for at least one year (median 8 years).

This number should reassure the project that farmers are willing to invest much more than the actual costs required, and that these investments are not a considerable burden on for the household budgets.

3.8 Climate change

Interviewees were asked if they had heard of the term 'climate change'. Surprisingly 87.5 percent of the sample had heard of it, and respondents continued to answer questions about the impact of climate change on their lives and their preparation and adaption strategies.

3.8.1 Awareness and experience with climate change

The most common observation given regarding climate change is 'changes in weather' (42.6 percent). This is a very general term and enumerators constantly asked for more details. Most interviewees were not be able to give clearer explanations, as the weather has changed so much that no new patterns could be distinguished. Other common observations were unpredictable and erratic rainfall (16.3 percent) and increased rainfall (11.7 percent). Other answers, such as changes in rain patterns (7.1 percent), prolonged dry season (8.35 percent) and rainy and dry spells alternating in one season (3.1 percent) indicate that the observed changes relate to unpredictable weather, with more water during the wet period and less rain during the dry period. The rhythms of the seasons have changed, and within a season there are unpredictable alternations between rainy and dry spells.

In focus groups, farmers mentioned that rivers are drying due to erratic rainfalls, which leads to watering problems for cattle. Also, soil fertility has decreased due to the effects of exotic trees or poor replenishment of soil nutrients. Indigenous trees, bushes and shrubs have become extinct in their opinion.

Households that could not explain the term 'climate change' gave possible explanations which they associate with this term. Again, the majority answered with 'changes in weather' and 'increased rainfall'. Graph 6 summarizes the most striking changes observed regarding changes in weather.

Graph 6. Most striking changes in climate
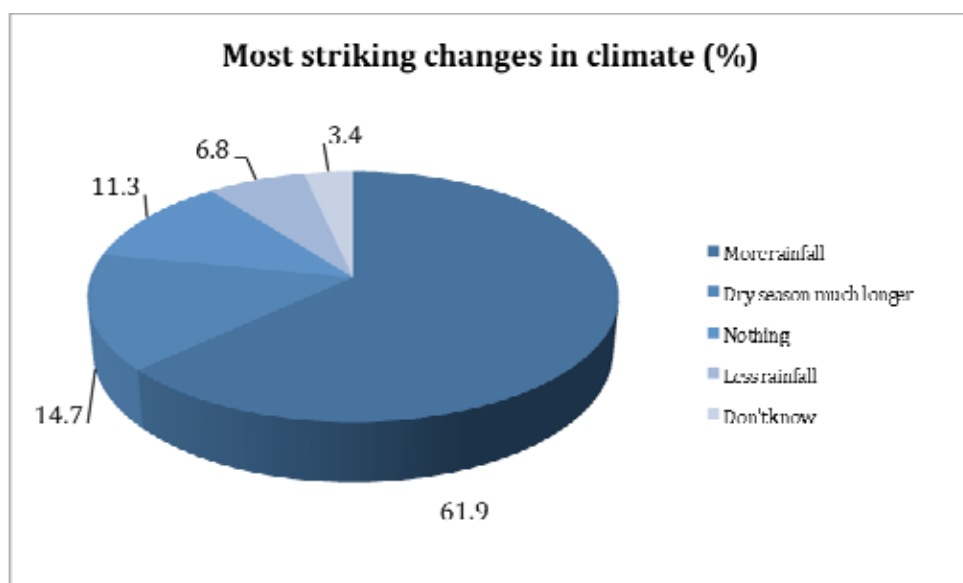
These results are in line with the statements given by the interviewees that they observe more rainfall and prolonged dry seasons. They indicate that climate change is predominantly experienced by less or more water, rather than through changes in temperature or other indicators.

For almost a quarter of all respondents, the most striking impact of climate change on their families are increased diseases, such as flu and pneumonia. This accounts for the second most commonly stated impact of climate change: increased expenditures on such things as drugs, medication and warmer clothing. Food expenditures have also increased as a result of destroyed crops. The impacts are closely interrelated: the destruction of crops causes lower yields, which reduces production, causing food shortages, lowering household incomes and increasing household expenditures on food and other items.

Graph 7. Impact on families due to climate change
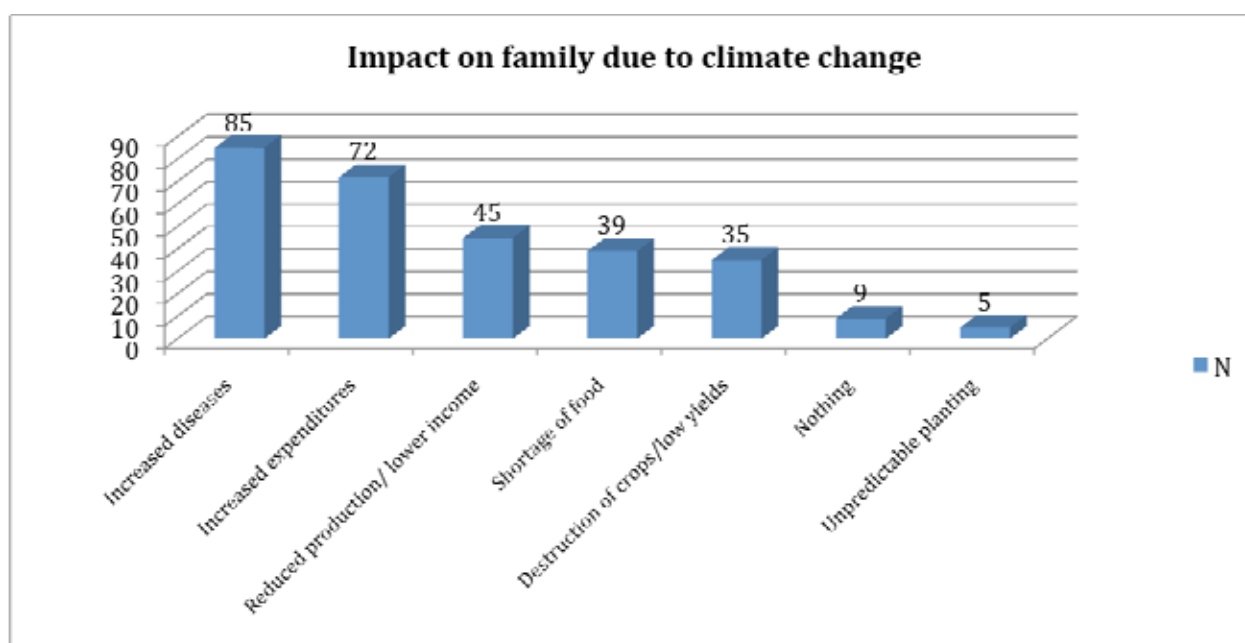
The above trends are reflected in the answers regarding the impact of climate change on agriculture and livestock. About one-third of respondents emphasized the reduced production and yields (30.3 percent) resulting of climate change, whereas 14.8 percent mention the death of livestock. A decrease in milk production was observed by 12.6 percent of the respondents and the destruction of crops by 12 percent. Erosion is mentioned by 7.3 percent of the respondents in the household-based questionnaire, but it is mentioned very often in focus group discussions.

On the other hand, some farmers have also seen some positive impact due to climate change, noting an increase in farm production (2.5 percent), improved milk production (2.2 percent), and more available feed (1.4 percent). No changes at all were observed by 3.1 percent of the farmers.

3.8.2 Adaptation and preparedness

When asked how they have modified their agriculture and livestock practices as a result of observed climate change, almost one-quarter of the farmers said they have made no changes at all. About 10 percent had started to build terraces to adapt to the increase in rainfall (to avoid erosion) and use slopes for cropping. Another 10 percent reduced their herd to require less fodder and land and concentrated on improving the milk production of the smaller herd. Some other responses to climate change mentioned by less than 10 percent of the respondents include, changing to crops that prefer

drier conditions, grow faster and produce higher yields (8.2 percent); changing planting practices, such as planting in rows (6.8 percent); planting cover crops; using manure or double digging; building sheds to protect livestock, especially against hailstorms (6.8 percent); and growing animal feed (5.3 percent).

Strategies to prepare for future changes resulting from climate variability are similar to those already made, but there are some variations. The same number of people who had made no changes yet are not planning to change anything in the future either. The most common answer regarding future preparedness was building sheds (19.5 percent) followed by timely planting and harvesting (16.4 percent). Building terraces (9.2 percent), building and using a food or fodder storage container (6.2 percent), growing other crops (5.8 percent) and growing trees (5.1 percent) were also mentioned. Again, fodder or livestock related issues were not often mentioned.

Farmers in focus group discussions spoke about reducing deforestation and increasing afforestation. They want to avoid planting exotic trees, which have had a negative impact on soils. To control erosion, they increase terracing and generally reduce farming on sloppy and swampy grounds.

From the given answers it is clear that the farmers can easily identify the observed changes in weather. However, the reasons they give for these changes are mainly examples of changes in weather, rather than explanations for why these changes occur. In focus groups interview, partners were aware that their activities also contribute to such changes in the weather. Clearing forests to plant food crops, farming of sloppy and swampy grounds and overstocking are seen as factors created by the farmers themselves that cause environmental degradation.

Cropping is obviously the main factor where the impact of climate change can be observed and where farmers already have made changes to adapt to the changing conditions. There is clearly room to implement more adaptive strategies. The need to assist farmers with cropping techniques and crop selection could be the main contribution of the MICCA Programme's cooperation with EADD. As mentioned above, climate-smart agriculture techniques and the right crop selection for food and fodder production could be sustainable approaches to local climate change mitigation and adaptation strategies.

3.9 Household economics

This chapter looks at the different sources of household revenue and the actual income rendered from it. It also assesses the economic household situation of respondents and how the household economic situation might impact other issues of interest for the MICCA Programme.

3.9.1 Sources of revenues

Interviewees were asked to state the source of revenue for each economically active household member. Even though family members worked on the same farm, income from their 'own' agriculture and livestock has been noted separately. However, it is difficult to distinguish for each family member working on the same farm a specific 'income'. For this reason, one household income was calculated for all economically active household members. The majority of interviewees mentioned several sources of revenue for one economically active household member. 293 households have at least two economically active household members; 61 households have up to three economically active household members; 23 households have up to four economically active members; and ten households have up to five economically active household members.

Graph 8. All sources of revenue
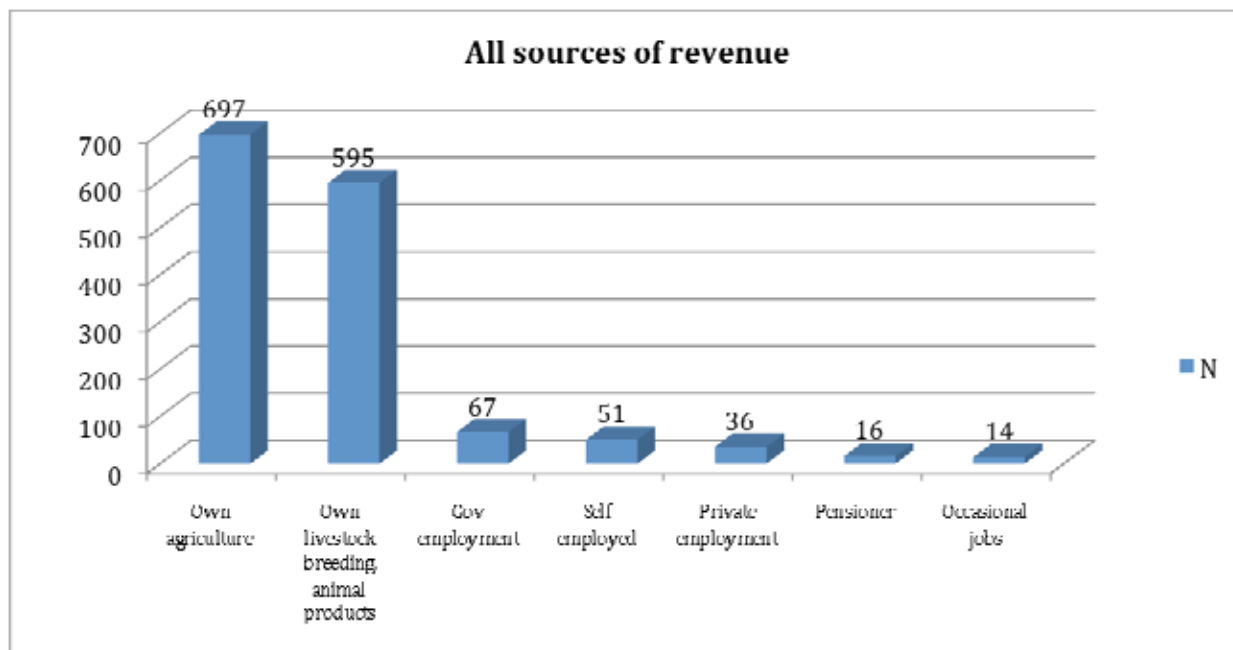
Graph 8 clearly shows that the majority of all economically active household members in the sample cultivate their own crops (46.6 percent) and have their own livestock (39.8 percent). Some government employees (4.5 percent) and privately employed persons (2.4 percent) are also inlcuded. It must be stated that these persons are also likely to have cultivate their own crops and raise livestock, and therefore appear in both categories. The self-employed, which includes shop and other business owners accounted for 3.4 percent of the respondents. Only single cases are seasonal workers or paid farm labourers. Only one respondent receives assistance from the government. Sixteen respondents receive a pension.

As stated earlier, the majority of farmers both cultivate crops and raise livestock. The number of farmers practicing only one of these activities is very low. Only four households do not have any economically active household member. We have to assume that these households either refused to answer this question or practice subsistence farming and do not consider the self-consumed yields as an income. Other than these four households, all the other households (353) have at least one economically active household member.

The majority of respondents working as a government employee earn between 100 000 KSH and 600 000 KSH per year. Ten of these respondents make even more. Farmers mostly make between 50 000 and 400 000 KSH from agriculture and livestock production. Although the groups are very different in their sizes, these figures indicate that more money can be made from paid labour in government structures than in agriculture.

Household income is calculated on the basis of revenue from the sale of crops, livestock and other farming products, and the other paid economic activities that have been mentioned. These numbers must be treated with caution, as individuals tend to give unrealistic estimates that are intended to reflect favorably on the project. We therefore understand the given numbers and further calculations based on those figures represent estimates rather than exact and fully reliable data.

The annual household income for 345 households varies between 1 500 KSH and 20 062 200 KSH with an average of 343 373 KSH (median 115 800 KSH). Dividing the household income by all household members, the average annual per capita income is 104 502 KSH (median 25 100 KSH). The main breadwinner in almost 90 percent of the cases is a man and in all the other cases a woman.

Less than one-quarter of the interviewed household declared receiving additional income from other sources, including transfers from relatives abroad or within Kenya; a saving or microfinance club; credit from a bank or a project; and gifts, such as food or animals.

Table 18. All additional income and type of income

| Amount of all annual additional external income in KSH by type | Type of additional external income | | | | | | | | | | | | | Total | |
| | Transfer from relatives abroad | | Transfer from relatives in Kenya | | Gifts | | Saving clubs/micr ofinance | | Credit from bank/frien d/project | | Food and animals | | Cattle selling | | | |
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Up to 5000	0	.0	3	13.0	0	.0	2	10.5	0	.0	0	.0	0	.0	5	8.5
5001 to 10000	1	100 .0	6	26.1	0	.0	0	.0	0	.0	0	.0	1	50.0	8	13.6
10001 to 20000	0	.0	10	43.5	0	.0	6	31.6	3	16.7	0	.0	1	50.0	18	30.5
20001 to 40000	0	.0	2	8.7	1	100.0	2	10.5	5	27.8	1	100.0	0	.0	9	15.3
40001 to 100000	0	.0	1	4.3	0	.0	6	31.6	6	33.3	0	.0	0	.0	12	20.3
100001 to 150000	0	.0	1	4.3	0	.0	1	5.3	1	5.6	0	.0	0	.0	3	5.1
More than 150000	0	.0	0	.0	0	.0	2	10.5	3	16.7	0	.0	0	.0	4	6.8
Total	1	100	23	100	1	100	19	100	18	100	1	100	2	100	59	100

Table 18 shows that most of the money comes from relatives within Kenya and from saving clubs and credit, which could include the 'check-off' system, and advances provided through the DFBA. As the amounts are rather small in the overall scheme, the figures show that the overall income structure does not change significantly as a result of this additional income.

3.9.2 Expenditures

The table below shows the statistics of expenditures for households on an annual basis. Household items are clearly the most often stated expenditures, although 43 cases did not know about these expenditures or refused to answer this question. Education, agriculture and livestock, as well as transport, are expenses the majority of interviewees also need to cover[8].

Table 19. Statistics on annual expenditures (in KSH)

Statistics on annual expenditures in KSH on:	Household items	Health	Education/ school	Agriculture	Livestock	Social affairs	Transport	Rent agricultural land
Valid	314	174	269	233	210	123	212	22
Missing	43	183	88	124	147	234	145	335
Mean	37353	13821	52861	40260	18542	8069	10639	8641
Median	21600	6000	24000	12000	12000	4000	9600	2450
Minimum	2000	500	300	1000	500	400	200	1000
Maximum	360000	240000	500000	2338000	180000	60000	120000	65000
Sum	11728680	2404840	14219683	9380510	3893786	992464	2255540	190100

---

[8] The exact distribution by type of expenditure can be seen in Annex B.

Overall, households spend between 5 000 KSH per year and 2 757 000 KSH a year. The average amount is 128 759 KSH (median 70 800 KSH) per year. This is much less than the figures given for household income. Dividing the expenditure figures by all household members, the average annual per capita expenditure is 27 185 KSH (median 14 733 KSH) and varies between 750 KSH and 462 000 KSH.

3.9.3 Balanced household income

The most interesting question regarding household economics is the balance of income and expenditures, which gives an idea of the remaining 'profit'. When deducting expenditures from the overall household income, most cases end up with negative numbers. This can be explained in two ways: (i) the data given is biased and unreliable or (ii) the data is reliable, and people live on credit. A balanced income is calculated by adding up expenditures and income and dividing it by two. The following household income results:

Table 20. Mean values of balanced income (in KSH and USD)

Statistics on balanced income	Annual balanced income		Monthly balanced income		Annual balanced income per household head		Monthly balanced income per household head	
	KSH	**USD**	**KSH**	**USD**	**KSh**	**USD**	**KSh**	**USD**
Valid	343	343	343	343	343	343	343	343
Missing	14	14	14	14	14	14	14	14
Mean	242062	2660.2	20172	221.7	67075	737.09	5590	61.4
Median	117600	1292.3	9800	107.7	23817	261.72	1985	21.8

Taken annual gross national income (GNI) per capita of 790 USD (World Bank 2010) the per capita mean value of the annual balanced income of 737 USD is only somewhat lower than the national value. When considering the median value (50 percent of all respondents) of 261 USD in the sample, it is only a third of the national GNI per capita value. This difference is quite alarming and illustrates how different statistical values and possible consequences based on these values can be.

National statistics cite predominantly poverty lines calculated based on reports from the late 90s and mid 2000s. Technoserve refers to a monthly absolute poverty line of 1 562 KSH in 2008 with 45.9 percent living below it nationwide (based on Economic Survey 2008, Kenya Integrated Household Budget Survey 2005/2006; Technoserve 2008: 7). Taking the median of the balanced monthly per head income (50 percent of the sample) of 1 984 KSH in this sample, these values are not too different from national average figures.

A different picture arises for daily household or per capita income when factoring in the poverty lines usually used by the World Bank of 2 USD and 1.25 USD per person day.

Graph 9. Households in relation to poverty lines (%)

Households in relation to poverty lines (%)
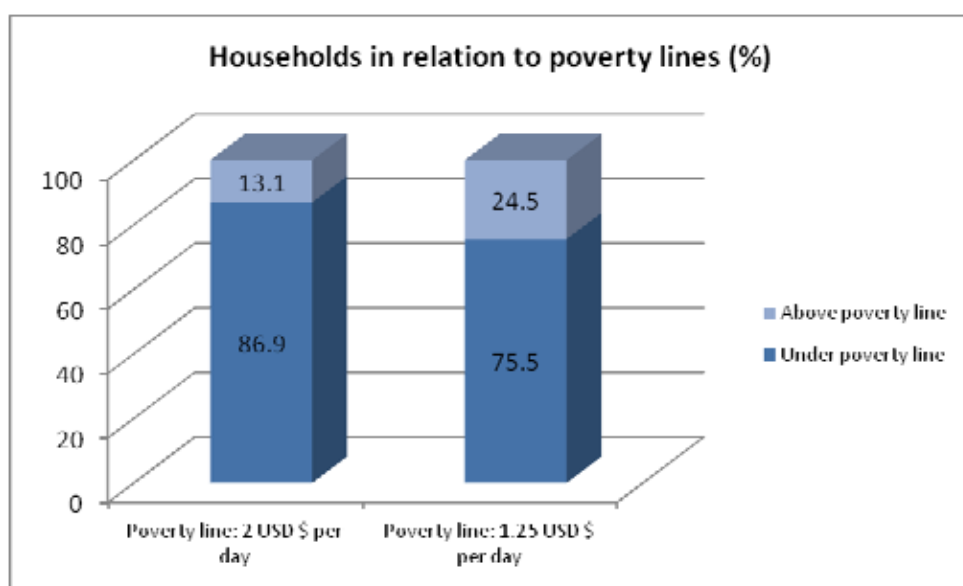
Graph 9 shows that, even when focusing on the household income per person and the balanced income per person per day, the majority of people in the sample live under these poverty lines. For the lower poverty line of 1.25 USD, this is more than two-thirds for the general income, and three-quarters when taking into account the balanced income.

Focusing on the income of project participants versus non-participants, it is clear that the average balanced annual household income is about 30 percent higher for participants than the overall sample value. Looking at the per capita balanced income, the values for project participants are about 25 percent higher than the sample average.

The annual household income for non-project participants is about 20 percent lower than the sample average and about 40 percent lower than those of project participants. On a per capita basis, non-participants have on average 15 percent less balanced income per year than the overall sample and about 33 percent less than project participants. Those are significant differences and indicate an improved household situation for project participants.

This situation is also reflected in project participants' economic situation in relation to poverty lines. Project participants living under the 2USD poverty line are only slightly less than the ratio of the overall sample. But the graph below shows that the group of persons living under the poverty line of 1.25 USD among project participants is more than 10 percent lower.

Graph 10. Households of project participants in relation to poverty lines (%)
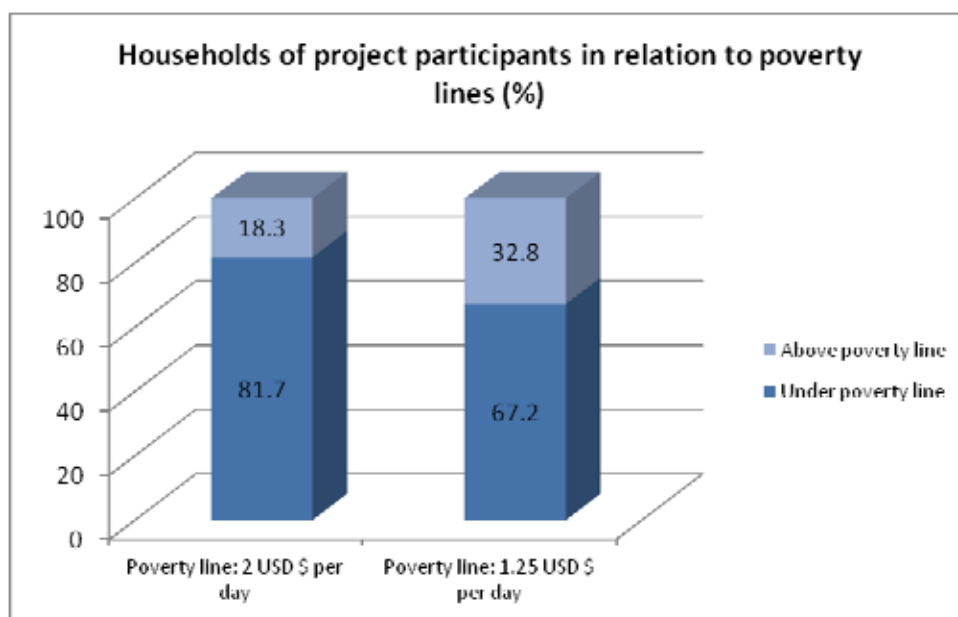
There were no significant differences for women-headed households. The ratio of women-headed households living above poverty lines is slightly higher than the overall sample. However, due to a very small sample size for women-headed households (59 cases) these figures are not very reliable. On the other hand, they suggest that women-headed households are not far below the poverty lines and do not consider themselves as extremely poor.

One can conclude that the household income from cropping and raising livestock is quite high in the area and conforms to national statistics. Having a closer look at balanced incomes and expenditures and the poverty lines defined by the World Bank, it is apparent that the area is quite poor, with the majority of people living under the poverty lines.

3.9.4 Economic assessment and priorities

Although the last chapter showed that the daily per capita income is very low, the majority of respondents consider their household situation as 'moderate' (71 percent) with enough money for food, clothes, health care and school fees. Less than 20 percent consider themselves as poor (only 1.7 percent as extremely poor) with problems purchasing food and clothing. On the other hand, only 10 percent perceive themselves as 'moderate' with enough money for luxurious goods like a motorcycle, a car or computers. Only two households out of 346 consider themselves as well-off and able to afford a car, a good house and many luxury goods.

Graph 11. Assessment of household situation (%)
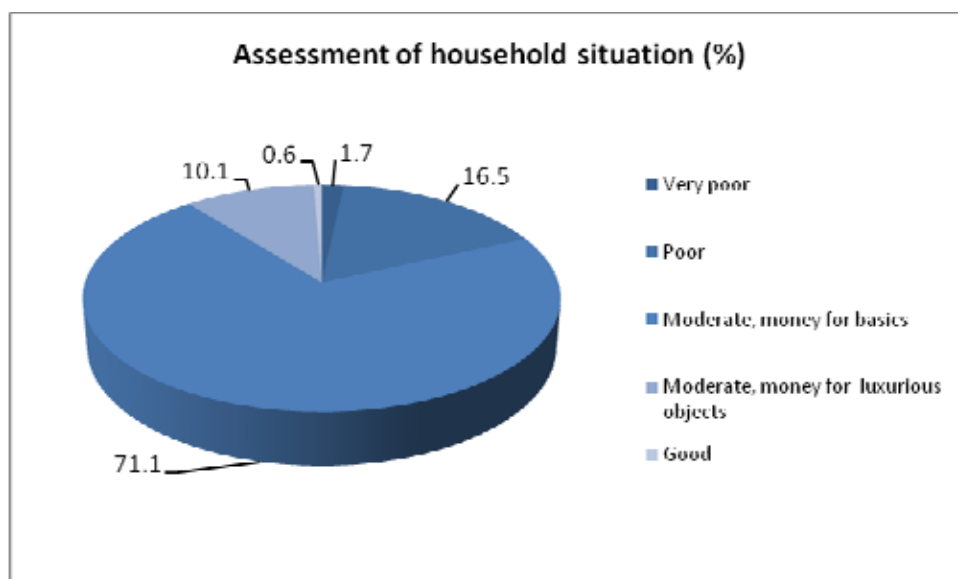
The table 21 shows the crosstab between the assessment of the economic household situation and the calculated balanced household income.

Table 21. Balanced income and assessment of household situation

Balanced household income in KSH	Assessment of household situation										Total	
	Very poor		Poor		Moderate, money for basics		Moderate, luxurious objects		Good			
	N	%	N	%	N	%	N	%	N	%	N	%
Up to 25000	2	40.0	5	9.1	14	5.9	1	2.9	0	.0	22	6.6
25001 to 50000	1	20.0	14	25.5	29	12.2	0	.0	0	.0	44	13.1
50001 to 75000	2	40.0	16	29.1	20	8.4	4	11.4	0	.0	42	12.5
75001 to 100000	0	.0	15	27.3	26	10.9	1	2.9	0	.0	42	12.5
100001 to 150000	0	.0	2	3.6	52	21.8	5	14.3	0	.0	59	17.6
150001 to 200000	0	.0	3	5.5	28	11.8	5	14.3	0	.0	36	10.7
200001 to 500000	0	.0	0	.0	52	21.8	8	22.9	1	50.0	61	18.2
More than 500000	0	.0	0	.0	17	7.1	11	31.4	1	50.0	29	8.7
Total	5	100.0	55	100.0	238	100.0	35	100.0	2	100.0	335	100.0

Besides a few outliers (e.g. earning less than 25 000 KSH and considering themselves moderate with money for luxurious goods), the overall self-evaluation corresponds with the actual income figures and can be seen as a reliable valuation.

The respondents who consider themselves as very poor, and those considering themselves as well-off, are non-participants from male-headed households with farms producing both crops and livestock. No other specific characteristics can be determined for those few cases.

Project participants did not consider themselves as either very poor or well-off. Possible reasons for those findings have been discussed in earlier. Other than that, the distribution among the economic classes are similar to the overall sample size.

In women-headed households, some respondents considered their economic situation as poor (in one case as very poor), but the majority consider it as moderate.

Table 22. Assessment of household situation (women-headed household)

Assessment of household situation (women headed household)	Frequency	Percent	Valid Percent
Very poor, there is sometimes even not enough food available	1	1.7	1.8
Poor, but have no food problems and only sometimes problems buying clothes	14	23.7	24.6
Moderate, enough money for food clothes, health care, school	31	52.5	54.4
Moderate, enough money even for some luxurious objects like motorbikes, car, computer	11	18.6	19.3
Total	57	96.6	100.0

Interviewees had the opportunity to state their three main priorities if they had more money available. The results are presented in table 23.

Table 23. All mentioned priorities

All mentioned priorities	First Priority		Second Priority		Third Priority		All priorities	
	N	%	N	%	N	%	N	%
Better Food	93	27.2	28	8.1	12	3.6	133	13.1
Better Clothes	1	.3	3	.9	4	1.2	8	.8
Repair house	13	3.8	16	4.6	43	13.0	72	7.1
Better health services	2	.6	19	5.5	60	18.1	81	7.9
Better schools	47	13.7	32	9.2	60	18.1	139	13.6
Better water	2	.6	12	3.5	13	3.9	27	2.6
Electricity supply	6	1.8	13	3.8	15	4.5	34	3.3
Buy car or motorbike	3	.9	6	1.7	8	2.4	17	1.7
Open shop/business	17	5.0	24	6.9	16	4.8	57	5.6
Start Professional training	1	.3	1	.3	1	.3	3	.3
Buy livestock	82	24.0	79	22.8	31	9.4	192	18.8
Hire farm staff	1	.3	3	.9	0	.0	4	.4
Buy livestock goods/equipment	36	10.5	46	13.3	37	11.2	119	11.7
Buy seeds			4	1.2	0	.0	4	.4
Buy agricultural goods/equipment	36	10.5	60	17.3	30	9.1	126	12.4
Other	2	.6	0	.0	1	.3	3	.3
Total	342	100.0	346	100.0	331	100.0	1019	100.0

Although most of the households assess their economic situation as moderate with only few problems regarding food and clothing, better food (27.2 percent) is the most often given first priority. Not surprisingly for the project area, the second priority item mentioned is livestock (24 percent) followed by better schooling (13.7 percent). Purchasing goods and equipment specifically for livestock was mentioned by 10.5 of the respondents and a further 10 percent said they would buy agricultural goods and equipment in general. Considering all the given priorities, the answers are more or less the same, with households requirements reflecting basic needs (food, school) and livestock-related concerns. Again, the figures could be biased, as respondents might have answered in favor of livestock-related priorities knowing they were being interviewed by a partner involved with EADD. In the future, after a number of trainings sessions have been organized outlining the benefits of climate-smart agriculture in combination with raising livestock, more cropping-related priorities may be expressed.

4. CONCLUSIONS AND RECOMMENDATIONS

The data analysis shows that the current focus of EADD, and by extension the farmers, is on raising livestock, improving milk production and developing businesses. So far, the project's main activities have been setting up farmer groups, establishing relations between the DFBA and milk suppliers and raising awareness about the project to get local support. Considering the chilling plant only started operations in September 2010, the growing number of milk suppliers and share holders, as well as the continual increase in supplied milk, represent a real measure of success for the project. It is an ideal time for the MICCA Programme to come on board and develop interventions together with EADD to build upon existing structures established by the project (farmer groups, contact farmers, functioning DFBA, etc,) and widen the scope of activities to include climate-smart agriculture and agroforestry as a means to increase food and fodder production and mitigate climate change.

These ideas are shared by the representative from the Kaptumo division, Mr Idenya, who would like to see more assistance in appropriate use of fodder, the cultivation of fodder legumes and the use of crop residues. This used to be the traditional approach "…which was lost along the way", according to him (Idenya 2011). He would welcome the MICCA Programme's support in introducing fodder trees to farmers and developing a nursery with local seeds. Possibilities should be explored for combine tea planting and climate-smart agriculture. The management team of the DFBA would also appreciate more training in the use of manure on different types of fodder grasses and an increase in on-farm production of feed concentrates.

In fruitful focus group discussions, farmers shared their ideas on where the MICCA Programme could provide future assistance. Suggestions include more awareness raising on EADD and MICCA Programme cooperation, assistance in developing organizational capacity development, more training on on-farm income diversification (e.g. advantages of small livestock targeted to women), finance (e.g. for the zero-grazing construction) or exchange and study visits. Farmers were very interested to learn more about the production and conservation of feed, soil nutrition and rain water harvesting. Others asked for more demonstration plots that would give more visibility to successful practices and serve as a model in the village. The chairman of the DFBA sums it up by saying "… seeing is believing…".

Obviously, the MICCA Programme and EADD are not be in a position to address all these 'wishes' as some are not within their mandate or project objectives. However, some of the ideas proposed are supported by the survey's findings and can serve as the basis for the following recommendations regarding the further involvement of the MICCA Programme.

I.   The MICCA Programme's main entry point is supporting on-farm fodder production with climate-smart agricultural tools in ways that will lead to higher milk production, fewer emissions, efficient manure management and possibly zero grazing. The Programme could:

   o   build upon existing knowledge and practices regarding climate-smart agriculture and fodder production, offer technical assistance on these practices to ensure planting and harvesting is done using climate-smart agricultural tools and principles;
   o   provide assistance through technical support on crop selection for fodder and the use and processing (e.g. with pulverizers) of crop residues; and
   o   promote improved manure management and analyse with EADD the compatibleness of zero-grazing units and develop strategies for their implementation if they are found to be appropriate (via check-offs, required materials and costs).

II. The MICCA Programme can provide knowledge on climate change and raise awareness about how to adopt agricultural practices in response to increased climate variability. The Programme could:

  o raise awareness about the causes and impact of climate change and the role farmers play in contributing to and mitigating climate change; and
  o show that climate-smart agriculture enables farmers to adapt to changes in climate and weather, increase their yields and enhance local food security.

III. The MICCA Programme's main objective is climate change mitigation and is well-placed position to offer tools to mitigate climate change through climate-smart agriculture and agroforestry. The Programme could:

  o assist in training sessions on climate-smart agriculture techniques and principles for food and fodder production, emphasizing manure management;
  o stress food and fodder storage as a mean of safeguarding food security and implementing climate change preparedness strategies;
  o intensify awareness on agroforestry and tree planting;
  o develop a strategy (establishing nursery, selling seeds, training farmers) to plant trees beneficial to fodder production and climate change mitigation; and
  o work on alternative energy sources (like biogas generation from manure) to decrease fuel wood requirements.

More general aspects which should be considered and addressed in further interventions include:

  o a clear introduction of EADD and the MICCA Programme in the villages with transparent communication of project objectives and activities; and
  o preparing a set of messages for general awareness activities about EADD and the MICCA Programme addressing the following topics among non-project participants:
    ▪ conditions of joining the project,
    ▪ real costs of joining the project (like registration fees, prices of shares),
    ▪ calculated potential costs versus potential profit (more yields) and
    ▪ work with existing groups or individuals in the villages as multipliers.

To carry out these recommendations, coordination among all project components is necessary. Greater coordination will help identify areas where activities will overlap and where synergies may arise. Possible strategies and activities need to be developed together to avoid duplicating efforts and to identify target audiences, activities, methodologies and indicators for monitoring and evaluating change. Findings should be compiled in an activity plan for all components. This plan could represent the road map for the cooperation of EADD and the MICCA Programme for the project site.

All planned interventions should address women and men equally, as survey results indicate that both men and women are involved in household decisions. In addition, as Mr Idenya from the Kaptumo Livestock Division added in his interview: "All kind of planned activities require ownership by people on the ground, no 'spoon feeding' projects are welcomed as they will not be sustainable."

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ANNEX A.
SOCIO-ECONOMIC SURVEY MICCA KENYA 2011

EADD - MICCA Project – Socio-economic Survey – Pilot projects Kenya

No of Interview: **Date:**   **Interviewer:**   **Ward:**   **Village:**

Introduction: "My name is …………., and I am working for the FAO MICCA project which is cooperating with the EADD project in your area. The project works on alternative agricultural practices as a way to mitigate climate change. Some interventions and trainings have been implemented already, others are still to follow. We are surveying some hundred households now to get an idea of your current livelihood and again in 3 years to document the changes. We would like to get your permission to ask you some questions about the social and economic household situation and the livestock practices. All information will be treated absolutely anonymously. The full confidentiality of this discussion is guaranteed"

****Ask each question and fill in each answer - always add DK = for 'don't know' and RA = 'refuse to answer' wherever needed!!!****

Part A: Data on demographics and education

1a. People living in HH (all hh members staying here more than half of the year)	1b. Interviewee [X]	1c. Head of hh [X]	2. Age	3. Marital status *1*	4. Ethnic group *2*	5a. Never been to school [X]	5b. Persons out of school [X]	5c. Current pupils [X]	6. Invalide [X]	51. Type of Source of Revenue *3* [ASK LATER!! - (several answers possible, mark DK, RA]			52. Annual income in KSH [mark DK, RA] Remember to check q18 (x12), q31; q33 in case hh has agriculture and q45.2 in case of other income			53. Main bread winner* 4* [rank 1-3]
1										1.	2.	3.	1.	2.	3.	
2										1.	2.	3.	1.	2.	3.	
3										1.	2.	3.	1.	2.	3.	
4										1.	2.	3.	1.	2.	3.	

											1.	2.	3.	1.	2.	3.	
5											1.	2.	3.	1.	2.	3.	
6											1.	2.	3.	1.	2.	3.	
7											1.	2.	3.	1.	2.	3.	

1 *1 = Married   2= Single   3 = Divorced   4 = Widowed   5 = Living together*

2 *1 = Luo   2 = Luhya   3 = Kalenjin   4 = Kikuyu   5 =   6 = Other: ………………………*

3 **Source of revenue**

1 =	*Gov. employment (factory, administration,)*	*5 =* *Seasonal worker (agriculture/livestock)*	*9 =* *Self employed (business, trade, handicraft)*	*13 =* *Not economically active*
2 =	*Private employment (factory, administration)*	*6 =* *Occasional jobs (piece jobs)*	*10 =* *Gov. assistance (invalid, unemployment…)*	*14= Children (<14) working*
3 =	*Paid labor in gov agriculture (full time)*	*7 =* *Own agriculture/farm management*	*11 =* *Pensioner*	*15= Children (>14) working*
4 =	*Paid labor in private agriculture (full time)*	*8 =* *Own Livestock breeding, animal products*	*12 =* *Housewife*	*16 =* *Other: ………….………….*

4 *1 = First important   2 = Second important   3 = Third important*

7.1   Did you ever participate in one of the EADD projects interventions like trainings, awareness activities?

1 = Yes   2 = No   88 = DK   99 = RA

7.2   In which of the following project interventions (implemented by EADD) did you/are you participating (trainings, support, …)?

	Interventions	Yes [mark x]	Joined/participated in *(mm/YYYY)*
1.	Participated in Training		
2.	Participated in Workshops		
3.	Participated in awareness and demonstration campaigns		
4.	Registered farmer at chilling facility		
5.	Shareholder with DFBA		
6.	Milk supplier		
7.	Learning/Exchange trips		
8.	Cattle received AI		
9.	Extension worker/trainer		
10.	Access to 'check off' from DFBA		
11.	Other:		

DFBA = Dairy farmer Business Association

AI = Artificial Insemination

HOUSEHOLD IDENTIFICATION VARIABLES

Village code *[2 letters]*		**Initial hh head**		**Birth year hh head**	

Name of household head:_____

Kaptumo	=	KT		Kaboi	=	KB
Ndurio	=	ND		Koyo	=	KY
Kapkolei	=	KL		Kapsaos	=	KS

PART C: HOUSEHOLDS ASSETS

8.   **Which of the following items do you own/have?** *[tick all, mark DK, RA]*

	Yes	No	Items		Yes	No	Items
8.1			Mobile phone	**8.8**			Refrigerator
8.2			Bicycle	**8.9**			Own stand pipe
8.3			Motorbike	**8.10**			Own borehole/well
8.4			Car/truck	**8.11**			Own water tank
8.5			Radio / stereo	**8.12**			Access to shared well/borehole/stand pipe
8.6			TV set or DVD	**8.13**			Latrine/toilet
8.7			Satellite dish	**8.14**			Other:

9.1   **What is your main energy source for the household** (cooking, heating…)**?** *[tick once]*

1 = Wood

2 = Charcoal

3 = Biogas (stove)

4 = Electricity

5 = Solar panel

6 = Battery (large, e.g. car battery for power)

7 = Other: ....

88 = DK   99 = RA

9.2   **For wood and charcoal, what is the weekly consumption** *[use kg/sacks or bags, or DK, RA]*

Volume per week   *In :*   *(sack, bag, wheel barrow...)*

PART D: FARMING PRACTICES

10.   **Do you practice any agriculture and / or livestock?** *[tick once]*

1 = Cropping only **(continue q24)**   3 = Cropping and Livestock

2 = Livestock only   4= None **(continue q35)**   88 = DK   99 = RA

11. **Does your farm have the following**? *[tick all, mark DK, RA]*

	Yes	No	Items		Yes	No	Items
11.1			Shovel	**11.9**			Milking parlour
11.2			Hoe	**11.10**			Milking machine
			Machete				Teat dip
11.3			Plough	**11.11**			Knap sack sprayer
11.4			Mechanical plough	**11.12**			Separation from animal and human
11.5			Ox/donkey cart	**11.13**			Barn for Livestock
11.6			Tractor	**11.14**			Pulveriser
11.7			Thresher	**11.15**			Chaff cutter
11.8			Biogas digester	**11.16**			Other:

12. **In case you own livestock, what kind of livestock do you own?** *[tick all, mark DK, RA]*

	Livestock	No of		Livestock	No of
12.1	Pigs		**12.4**	Chicken	
12.2	Goats		**12.5**	Cattle	
12.3	Sheep		**12.6**	Donkeys	

13.1 **In case you own cattle, please specify the type and give us some information regarding the milk production** *[note all or DK, RA]*

| Type of breed* | Herd composition (No of…) | | | | | Calves | | L milk /day | Sell its milk[x] |
	Bulls	Oxen	Milk cows	Cows	Heifer	Fe	Ma	(average per cow)	

*1 = Zebu   2 = Boran   3 = Aryshire   4 = Friesian   5 = Jersey   6 = Guernsey

6 = Aryshire cross   7 = Friesian cross   8 = Jersey cross   9 = Guernsey Cross   88 = DK   99 = RA

13.2 **In case the volume of milk per day varies significantly, give the different figures and describe what it depends on.**

a. *Max:*   *l/day*   *Min:*   *l/day*

_____

b. *Reason:*

_____

14. **Where do you keep your livestock predominantly?** *[tick once]*

1 = In a barn all the time (zero grazing)   5 = Grazing communal land and paddocks

2 = On paddocks   6 = Grazing, paddocks, barn

3 = Grazing on communal land   7 = Other: ....

3 = In barn and grazing communal land   88 = DK   99 = RA

4 = In barn and paddocks

15.   Please specify the sizes of plots used for livestock (paddocks) *[note all or DK, RA]*

	Plots/ paddocks	Size of plots				Space for # of cattle on it
		m^2	Square	Point	Acres	
15.1	1.					
15.2	2.					
15.3	3.					
15.4	4.					

Square = 0.05 Acres   Point = 0.1 Acres

16. How much is your overall produced milk per day?

Amount of produced milk _____ *In litres per day.*

17. What do you do with the milk from your milk cows? Please state daily amount *[note all or DK, RA]*

	Yes	No	Activities	l/day		Yes	No	Activities	l/day
17.1			Sell milk		**17.5**			Conserve as Lala	
17.2			Use for own consumption		**17.6**			Produce other products (yoghurt)	
17.3			Give away for free		**17.7**			Sell other milk based products	
17.4			Conserve as Murzik		**17.8**			Other:	

18. Monthly income from selling milk?

Monthly income from sold milk �_____ *in KSH/day*

19. Please share some information about your feeding system with us *[note all, mark DK, RA]*

	Fodder	Daily ratio %	Fed to*	Need to buy [x]	Self produced [x]	Weekly amount (in …) required (per cattle)	Weekly price in KSH
19.1	Fresh grass (grazing)					X X X	
19.2	Napier grass						
19.3	Kikuyu grass						
19.4	Hay/ Rhodes grass						
19.5	Lucerne						
19.6	Dismodium						
19.7	Other fodder legume						
19.8	Fodder trees						
19.9	Crop residues (straws, stover, …)						
19.10	Concentrates						
19.11	Supplements						

19.12							
Other:							

20. **If you make CONCENTRATE, what is common ratio of components?** *[note all or DK, RA]*

	Components of concentrate	Ratio (in %)
20.1		
20.2		
20.3		
20.4		

21. **If you do NOT produce FODDER, why don't you produce your own fodder?**

a.   *1. Reason:*

_____

b.   *2. Reason:*

_____

22. **What do you do with livestock manure?** *[note all, mark DK, RA]*

	Yes	No	Activities		Yes	No	Activities
22.1			Use as manure on own fields	**22.6**			Apply to produce fodder
22.2			Sell as manure to others	**22.7**			Construction material
22.3			Discard in surrounding area	**22.8**			Compost it
22.4			Use for fuel	**22.9**			Pile and dry it-discard
22.5			Biogas/Bioenergy	**22.10**			Other:

23.1 **Did you ever use Artificial Insemination for your cattle before?** *[tick once]*

1 = Yes   2 = No   88 = DK   99 = RA

23.2 **If yes, how often did you do it in the last 12 months?**

_____

Breed of the cow used AI on	Frequency of AI/year

*1 = Zebu   2 = Boran   3 = Aryshire   4 = Friesian   5 = Jersey   6 = Guernsey

6 = Aryshire cross   7 = Friesian cross   8 = Jersey cross   9 = Guernsey Cross   88 = DK   99 = RA

PART E: CROPPING PRACTICES

24.   Do you practice any cropping (incl. of vegetables, fruits, trees,…)? *[tick once]*

1 = Yes   2 = No **(continue q35)**   88 = DK   99 = RA

25.   What kind of cropping do you practice today? *[tick all, mark DK, RA]*

	Yes	No	Activities		Yes	No	Activities
25.1			Horticulture / Garden	**25.8**			Leased field
25.2			Cultivating one main field	**25.9**			Subsistence farming only
25.3			Cultivating several fields	**25.10**			Sell crops only (mangos, tea, maize…)
25.4			Cultivating communal land	**25.11**			Own consumption and selling of crops
25.5			Planting and harvesting trees	**25.12**			Shifting cultivation
25.6			Cultivating on group field	**25.13**			Harvest bushes and fruits
25.7			Own field	**25.14**			Other:

26.1 Do you face any problems regarding agriculture? *[tick once]*

1 = Yes   2 = No   88 = DK   99 = RA

26.2 If YES, what are the main problems (invasion from cattle, less yield, diseases….)?

a.   *1. Problem*

b.   *2. Problem*

27. **Do you know anything about conservation agriculture (CA)?** *[tick once]*

1 = Yes 2 = No 88 = DK 99 = RA

28. **Do you practice the following techniques?** *[tick all, mark DK, RA]*

	Yes	No	Techniques		Yes	No	Techniques
28.1			Double digging	**28.9**			Application of fertilizer
28.2			Mulching	**28.10**			Timely weeding
28.3			Avoid slash and burn	**28.11**			Weeding using chemicals
28.4			Crop rotation	**28.12**			Bush clearing
28.5			Planting in rows	**28.13**			No/minimum tillage
28.6			Planting hedge rows	**28.14**			Ridge cultivation
28.7			Crop cover	**28.15**			Terraces
28.8			Application of manure	**28.16**			Other

29. **Who decided to adopt/use those specific techniques?**

Who decided:

_____

30. **Which of those techniques (q30) have been most beneficial to increase your agricultural productivity (cropping & livestock)?**

a. *1.Cropping:*

_____

b. *2. Livestock:*

_____

31. Please share some information about your crops with us *[note all, including tea, mark DK,RA]*

	Crops/Tree (crops)	Plot Size				No. of trees	Manure [x]	Fert. [x]	Herb. [x]	Pest. [x]	Used as fodder [x]	Residue used as fodder [x]	Annual yield (in ..)	Able to sell? [x]	Annual quantity sold (in …)	Annual revenue (in KSH)
		m²	Square	Point	Acres											
1.																
2.																
3.																
4.																
5.																
6.																
7.																

32.1 Did you use soil conditioner in the last 12 months? *[tick once]*

1 = Yes   2 = No   88 = DK   99 = RA

32.2 What type of conditioner and how often did you use it in the last 12 months?

	Type of conditioner	Times used in last 12 months
1.		
2.		

33. **What other agricultural products do you produce or harvest** (beekeeping, fish …)**?** *[note all, mark DK,RA]*

	Product	Where*	Annual yield (in …)	Able to sell? [x]	Annual quantity sold (in …)	Annual revenue (in KSH)
1.						
2.						
3.						
4.						

*1 = Own field   2 = Own garden   3 = Group field   4 = Communal land   5 = At home

6 = At barn   7 = Forest   8 = Other (fill in row)   88 = DK   99 = RA

34. **How big is the overall size of your land used for crops?** *[Please assist interviewee to calculate all the agricultural land which is owned and other plots if applicable] Overall size of land used for crop: _____In m^2 / Square / Point / Acres:*

35.1 Did you plant or protect trees in the last 12 months? *[tick once]*

1 = Yes 2 = No 88 = DK 99 = RA

35.2 If Yes, what kind and how many?

	Type of trees	No of planted trees / (unit)	No of deliberately protected trees / (unit)	On own land [x]
1.				
2.				
3.				

35.3 If NO, are you planning to plant and protect trees in the near future? *[tick once]*

1 = Yes 2 = No 88 = DK 99 = RA

PART F: MARKET, LABOUR AND FOOD SECURITY

36. **Where are the next markets that you sell your products? Please state all markets you travel to on a regular basis (at least four times a year).** *[note all, also markets for milk]*

	Name of market / village/location	Sold goods (incl. fodder legume, milk.)	Frequency - Self*	Frequency – middle man*	Distance (both ways in km)	Mode of transport
1.						
2.						
3.						
4.						

*1 = Twice a year 2 = Every three months 3 = Every second month 4 = Monthly

5 = Every second week 6 = Every week 7 = Twice a week 8 = Daily

9 = Other……………… 88 = DK 99 = RA

37.1 Did you hire staff/laborer on your farm in the last 12 months? *[tick once]*

1 = Yes   2 = No   88 = DK   99 = RA

38.   **If yes, how many and for how long?** *[note all, mark DK,RA*

		Permanent staff/laborer		Casual Laborer	
	Staff	**No of**	**Main tasks**	**Man day/year**	**Main tasks**
38.1	**Women**				
38.2	**Men**				
38.3	**Girls under 14**				
38.4	**Boys under 14**				

39.1   **Are you able to provide food for your family from your own products?** *[tick once]*

1 = Yes   2 = Sometimes   3 = Never   88 = DK   99 = RA

39.2   **How many months (in the last 12 months) per year are you able to provide food from your own agricultural practices for your family?** *[tick once]*

1 = 1-3 months per year   6 = Could not provide for family back then

2 = up to 6 months per year   7 = Very irregular

3 = Up to 9 months per year   8 = Other: ....

4 = The whole year   88 = DK

5 = Even more than for a year   99 = RA

40.1   **Do you have any food or fodder storage devices?** *[tick once]*

1 = Yes   2 = No   88 = DK   99 = RA

40.2   **If yes, what type of storage do you have:** *[note all, mark DK,RA*

Type of food storage:	Capacity (unit):

Type of fodder storage:	Capacity (unit):
Mixed Storage:	**Capacity (unit):**

[Remember if the interviewee mentioned in the beginning of the interview if he/she participates in project activities or not. If interviewee does participate continue with Part G. If interview does not participate, continue with Part H.]

PART G: QUESTIONS FOR PROJECT PARTICIPANTS

The following questions are meant for all farmers participating in the different aspects of the project t (not just chilling plant members)

41.   You said you participated in some activities of the project, who decided to join and why did you decide to join the project?

a.   Who decided:

b.   Reason to join

42.1   Did you have to make an initial investment when you decided to join the project?

1 = Yes   2 = No   88 = DK   99 = RA

42.2   If Yes, what kind and for what? *[Remind them about labour, membership fee, shares, equipment and list them]*

	Type of costs	Initial amount in KES
1.		
2.		
3.		
	Total:	

43.1 Does your participation in the project result in additional costs on a regular basis?

1 = Yes   2 = No   88 = DK   99 = RA

43.2 If Yes, what kind and for what?

	Type of costs	In	Amount in last 12 months
1.	Labor	KES	
2.	Equipment	KES	
3.	Expenditure for share	KES	
4.	Resources (fodder, drugs)	KES	
5.	Veterinary services/health	KES	
6.	Additional Time	Hours	
7.	Other:		

44.1 Do you think you had more benefits or more disadvantages from joining the project?
[tick once]

1 = More benefits   2 = More disadvantages   3 = Even/balanced   88 = DK   99 = RA

44.2 What do you consider the main benefits from joining the project?

a.   *1. Benefit*

b.   *2. Benefit*

44.3 What do you consider the main disadvantages from joining the project?

a.   *1. Disadvantage*

b.   *2. Disadvantage*

45.1 In your opinion, did your income increase since you joined the project? *[tick once]*

1 = Yes   2 = No   88 = DK   99 = RA

45.2 If Yes, looking at all possible changes due to the participation in the project (healthier animals, stronger breeds, new businesses etc.) how much additional money did you earn in the last 12 months? *[Please assist interviewee to think of all possibilities that have occurred due to CA and brought some revenue]*

	Type of Income/Business	Additional amount (in last 12 months)	In
1.			KSH
2.			KSH
3.			KSH

PART H: NON PARTICIPANTS OF THE PROJECT

46.   You mentioned that you are not participating in the EADD project and its facilities. Who in your family decided not to join and why?

a.   Who decided:

b.   Reason:

47.   What would you need/wish for so you join the project, become part of the chilling plant, learn other agricultural practices? *[tick all, mark DK, RA]*

	Yes	No	Items		Yes	No	Items
47.1			More training	**47.6**			See good examples
47.2			Lower costs of initial investment	**47.7**			More immediate benefit/revenue
47.3			Less money for membership	**47.8**			More assistance from a project
47.4			More labour force	**47.9**			
47.5			More equipment	**47.10**			Other:

48.   If you would have the opportunity to produce more milk and have more agriculture revenue, what would you be willing to invest initially?

Initial investment: *in KSH*

PART I: CLIMATE AND MITIGATION AWARENESS AND KNOWLEDGE

49.1 Have you ever heard of the term 'Climate Change'? *[tick once, mark DK, RA]*

1 = Yes   2 = No   88 = DK   99 = RA

49.2 If YES, what is it?

a.   *1. Explanation:*

b.   *2. Explanation:*

49.3 If NO, what could it be?

a.   *1. Explanation:*

b.   *2. Explanation:*

50.   What is the most striking change in weather and climate that you could observe over the last decade? *[Please explain interviewee the basics of climate change and concentrate on weather variability] [tick once]*

1 =   Nothing *[continue q51]*   5 =   Dry season much longer

2 =   More rainfall   6 =   Other……….

3 =   Less rainfall

4 =   More floods   88 =   DK   99 = RA

50.1 In case you observed changes, what impact did it have on you and your family?

a.   *Impact 1:*

b.   *Impact 2:*

50.2 What impact did it have on your livestock/agriculture?

a.   *Impact 1:*

b.   *Impact 2:*

50.3 Due to observed changes, what did you change regarding your livestock and agriculture or other issues?

a. *Change 1:*

_____

b. *Change 2:*

_____

50.4 What are you already doing or planning to do to be prepared for such incidences/changes in the future?

a. *Preparation 1:*

_____

b. *Preparation 2:*

_____

PART J: ECONOMIC SITUATION

51. to 53.	*Interviewer: Ask questions 51 to 53 in Table on page 1*

54.1   Do you have additional sources of household income? *[tick once]*

1 = Yes   2 = No   88 = DK   99 = RA

54.2   If Yes, what kind of sources? *[tick all, mark DK, RA]*

	Type of Sources*	Amount per year in KSH
a.	**1.**	
b.	**2.**	
C	**3.**	

*1=Transfer from relative abroad   2 = Transfer from relative in Kenya   3 = Gifts

4 = Saving Clubs/Microfinance   5 = Credit from bank/friend/project   6 = Food and animals

7 = Other (fill in row   8 = Other: …………………………   88 = DK   99 = RA

55. Please share with us your monthly expenditures in KSH. *[Reassure the interviewee that information will be treated anonymously at all times. Note monthly **OR** anural amount, preferably monthl. Enter DK/RA were applicable.]*

Items of Expenditure	KSH/month	KSH/year

55.1	Household expenditures (food, soap, phone, taxes)		
55.2	Health		
55.3	Education/School		
55.4	Agriculture (incl. of staff, equipment) **Check questions above**		
55.5	Livestock (incl. of staff, veterinary services) C**heck questions above**		
55.6	Social expenditures (gifts, weddings)		
55.7	Transport		
55.8	Rent: agricultural land		
55.9	Rent: for house		
55.10	**Total**		

56.   How do you assess the economic situation of your household? *[tick only once]*

1 = Very poor, there is sometimes even not enough food available

2 = Poor, but have no food problems and only sometimes problems to buy clothes

3 = Moderate, enough money for food, clothes, health care, school

4 = Moderate, enough money even for some luxurious objects like motorbikes, car or computer

5 = Good, can run a good car, own good house, have many luxurious objects

88 = DK   99 = RA

57.   If you would have the ability to spend more money from additional income what would be your priorities? *[respondent should give priority numbers from 1 (very important), 2 (a bit less important) to 3 (less important); please ask the question openly and tick respective given answers]*

	Priority	Items		Priority	Items
57.1		Better food	**57.9**		Open shop or start business
57.2		Better clothes	**57.10**		Start professional training / studies
57.3		Repair, rebuilt house	**57.11**		Buy livestock
57.4		Better health services	**57.12**		Hire farm staff
57.5		Better schools (clothing, books)	**57.13**		Buy livestock goods/equipment
57.6		Better water/sanitation/ sewerage system	**57.14**		Buy seeds/trees
57.7		Electricity supply	**57.15**		Buy agricultural goods/equipment

57.8		Buy car or motorbike	57.16		Other:

Enumerator, please thank the interview partner for their efforts and time!

58. Evaluation of interview:

How do you assess the sincerity of the interviewed person?

1 = Sincere

2 = Not sincere

3 = Can not estimate the sincerity

ANNEX B:
TABLES PER QUESTION (Q) IN HOUSEHOLD QUESTIONNAIRE [9]

Q0

0 Name of interviewer	Frequency	Percent	Valid Percent
Silas Korir	64	17.9	17.9
Stella Tuweiy	44	12.3	12.3
Stanley Maritim	66	18.5	18.5
Edith Kibet	53	14.8	14.8
Joseph Kitur	2	.6	.6
Elly Kemboi	68	19.0	19.0
Doreen	60	16.8	16.8
Total	357	100.0	100.0

00 Name of the interviewer and date	Silas Korir		Stella Tuweiy		Stanley Maritim		Edith Kibet		Joseph Kitur		Elly Kemboi		Doreen		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
05.09.11	6	9.4	6	13.6	4	6.1	2	3.8	2	100.0	6	8.8	0	.0	26	7.3
06.09.11	7	10.9	5	11.4	6	9.1	7	13.2	0	.0	6	8.8	1	1.7	32	9.0
07.09.11	6	9.4	6	13.6	6	9.1	6	11.3	0	.0	6	8.8	3	5.0	33	9.2
08.09.11	2	3.1	7	15.9	7	10.6	10	18.9	0	.0	10	14.7	5	8.3	41	11.5
09.09.11	12	18.8	5	11.4	6	9.1	6	11.3	0	.0	6	8.8	10	16.7	45	12.6
12.09.11	8	12.5	7	15.9	7	10.6	0	.0	0	.0	8	11.8	15	25.0	45	12.6
13.09.11	8	12.5	0	.0	11	16.7	8	15.1	0	.0	10	14.7	10	16.7	47	13.2
14.09.11	5	7.8	3	6.8	4	6.1	5	9.4	0	.0	6	8.8	1	1.7	24	6.7
15.09.11	5	7.8	0	.0	10	15.2	6	11.3	0	.0	6	8.8	9	15.0	36	10.1
16.09.11	5	7.8	5	11.4	5	7.6	3	5.7	0	.0	4	5.9	6	10.0	28	7.8
Total	64	100.0	44	100.0	66	100.0	53	100.0	2	100.0	68	100.0	60	100.0	357	100.0

000 Location of Interview	Frequency	Percent	Valid Percent
Kaptumo	58	16.2	16.2
Ndurio	60	16.8	16.8
Kapkolei	59	16.5	16.5
Koyo	61	17.1	17.1
Kapsaos	61	17.1	17.1
Kaboi	58	16.2	16.2
Total	357	100.0	100.0

---

[9] *To navigate to specific question: With strg+f open search option, enter q and the desired question number*

Q1

1a. Number of people living in the household	Statistics
N Valid	357
N Missing	0
Mean	4.98
Median	5.00
Minimum	1
Maximum	9
Sum	1778

1b. Number of people living in the household	Frequency	Percent	Valid Percent
1	3	.8	.8
2	21	5.9	5.9
3	49	13.7	13.7
4	76	21.3	21.3
5	65	18.2	18.2
6	64	17.9	17.9
7	60	16.8	16.8
8	18	5.0	5.0
9	1	.3	.3
Total	357	100.0	100.0

1c. Number of adults living in household	Statistics
N Valid	357
N Missing	0
Mean	2.91
Median	2.00
Minimum	1
Maximum	7
Sum	1038

1d. Number of adults living in household	Frequency	Percent	Valid Percent
1	13	3.6	3.6
2	173	48.5	48.5
3	70	19.6	19.6
4	56	15.7	15.7
5	28	7.8	7.8
6	14	3.9	3.9
7	3	.8	.8
Total	357	100.0	100.0

1e. Number of children living in household	Statistics
N Valid	271
N Missing	86
Mean	2.71
Median	3.00
Minimum	1
Maximum	6
Sum	734

1f. Number of children living in household	Frequency	Percent	Valid Percent
1	59	16.5	21.8
2	74	20.7	27.3
3	62	17.4	22.9
4	47	13.2	17.3
5	21	5.9	7.7
6	8	2.2	3.0
Total	271	75.9	100.0

1g. Number of elderly (over 65) living in the household	Statistics
N Valid	89
N Missing	268
Mean	1.37
Median	1.00
Minimum	1
Maximum	2
Sum	122

1h. Number of elderly (over 65) living in the household	Frequency	Percent	Valid Percent
1	56	15.7	62.9
2	33	9.2	37.1
Total	89	24.9	100.0

1i. Sex of interview partner	Frequency	Percent	Valid Percent
Woman	204	57.1	57.5
Man	145	40.6	40.8
Woman and Man together	4	1.1	1.1
Boy	1	.3	.3
Boy and girl together	1	.3	.3
Total	355	99.4	100.0

1j. Head of household	Frequency	Percent	Valid Percent
Husband	297	83.2	83.2
Wife/woman	59	16.5	16.5
Son	1	.3	.3
Total	357	100.0	100.0

Q2

2a. Age of interviewee (grouped)	Statistics
N Valid	356
N Missing	1
Mean	43.16
Median	40.00
Minimum	18
Maximum	90

2b. Age of interviewee (grouped)	Frequency	Percent	Valid Percent
Up to 25	32	9.0	9.0
26 to 30	53	14.8	14.9
31 to 40	103	28.9	28.9
41 to 50	65	18.2	18.3
51 to 60	51	14.3	14.3
61 to 70	39	10.9	11.0
Older than 70	13	3.6	3.7
Total	356	99.7	100.0

2c. Age of second interviewee (grouped)	Statistics
N Valid	11
N Missing	346
Mean	32.0000
Median	31.0000
Minimum	21.00
Maximum	58.00
Sum	352.00

2d. Age of second interviewee (grouped)	Frequency	Percent	Valid Percent
Up to 25	3	.8	27.3
26 to 30	2	.6	18.2
31 to 40	5	1.4	45.5
51 to 60	1	.3	9.1
Total	11	3.1	100.0

2e. Age of youngest household member (grouped)	Statistics
N Valid	349
N Missing	8
Mean	12.3023
Median	10.0000
Minimum	.08
Maximum	70.00

2f. Age of youngest household member (grouped)	Frequency	Percent	Valid Percent
Up to 1	39	10.9	11.2
1.1 to 2	28	7.8	8.0
2.1 to 4	35	9.8	10.0
4.1 to 6	28	7.8	8.0
6.1 to 10	65	18.2	18.6
10.1 to 14	38	10.6	10.9
14.1 to 18	45	12.6	12.9
18.1 to 21	20	5.6	5.7
Older than 21	51	14.3	14.6
Total	349	97.8	100.0

2g. Age of oldest household member (grouped)	Statistics
N Valid	352
N Missing	5
Mean	49.55
Median	48.00
Minimum	21
Maximum	100

2h. Age of oldest household member (grouped)	Frequency	Percent	Valid Percent
Up to 30	35	9.8	9.9
31 to 35	37	10.4	10.5
36 to 40	54	15.1	15.3
41 to 50	76	21.3	21.6
51 to 60	71	19.9	20.2
61 to 70	47	13.2	13.4
Older than 70	32	9.0	9.1
Total	352	98.6	100.0

Q3

3. Marital status of interviewed person	Frequency	Percent	Valid Percent
Married	285	79.8	81.9
Single	34	9.5	9.8
Divorced	7	2.0	2.0
Widowed	22	6.2	6.3
Total	348	97.5	100.0

Q4

4. Ethnic group of interviewee	Frequency	Percent	Valid Percent
Luhya	1	.3	.3
Kalenjin	353	98.9	99.7
Total	354	99.2	100.0

Q5

5a. Number of household members never been to school	Statistics
N Valid	28
N Missing	329
Mean	1.43
Median	1.00
Minimum	1
Maximum	2
Sum	40

5b. Number of household members never been to school	Frequency	Percent	Valid Percent
1	16	4.5	57.1
2	12	3.4	42.9
Total	28	7.8	100.0

2 households mention to have one person under 14 who has never been to school.

5c. Number of household members already out of school	Statistics
N Valid	346
N Missing	11
Mean	2.45
Median	2.00
Minimum	1
Maximum	7
Sum	849

5d. Number of household members already out of school	Frequency	Percent	Valid Percent
1	30	8.4	8.7
2	211	59.1	61.0
3	54	15.1	15.6
4	28	7.8	8.1
5	16	4.5	4.6
6	6	1.7	1.7
7	1	.3	.3
Total	346	96.9	100.0

In two households (one and two) children less than 14 years old have already left school.

5e. Number of household members currently in school	Statistics
N Valid	279
N Missing	78
Mean	2.71
Median	2.00
Minimum	1
Maximum	6
Sum	756

5f. Number of household members currently in school	Frequency	Percent	Valid Percent
1	61	17.1	21.9
2	80	22.4	28.7
3	59	16.5	21.1
4	44	12.3	15.8
5	28	7.8	10.0
6	7	2.0	2.5
Total	279	78.2	100.0

Q6

6. Number of invalid children in the household	Frequency	Percent	Valid Percent
1	4	1.1	66.7
2	2	.6	33.3
Total	6	1.7	100.0

7 households mention to have an adult invalid household member.

Q7

7a. Interviewee participated in the project	Frequency	Percent	Valid Percent
Yes	136	37.8	37.9
No	220	61.9	62.1
Total	356	99.7	100.0

7b. Interviewee participated in the project (1)	Participation in Training		Participation in Workshop		Participation in awareness campaigns		Registered farmer at chilling plant		Shareholder with DFBA	
Yes	61	17.1	4	1.1	13	3.6	74	20.7	15	4.2
No	296	82.9	353	98.9	344	96.4	283	79.3	342	95.8
Total	357	100.0	357	100.0	357	100.0	357	100.0	357	100.0

7c.Interviewee participated in the project (2)	Milk supplier		Participation in Learning and Exchange trips		Cattle has received AI		Extension worker or trainer for EADD		Access to 'check off'	
Yes	113	31.7	2	0.6	8	2.2	0	0	1	0.3
No	244	68.3	355	99.4	349	97.8	357	100.0	356	99.7
Total	357	100.0	357	100.0	357	100.0	357	100.0	357	100.0

The term 'check off' might have been misunderstood by interview partners. From other interviews and other answers in the questionnaire, it is known that many of the project beneficiaries value the possibility to have access to loans, get paid in advance and purchase certain goods or pay certain bills (e.g. school fees) with the assistance of the chilling plant. See questions XYZ

7d. Number of different activities/participations in project	Statistics
N Valid	136
N Missing	221
Mean	2.1397
Median	2.0000
Minimum	1.00
Maximum	6.00
Sum	291.00

7e. Number of different activities/participations in project	Frequency	Percent	Valid Percent
1.00	32	9.0	23.5
2.00	67	18.8	49.3
3.00	29	8.1	21.3
4.00	3	.8	2.2
5.00	4	1.1	2.9
6.00	1	.3	.7
Total	136	38.1	100.0

7.f Assess economic situation of the household	Number of different activities/participations in project													Total	
	1.00		2.00		3.00		4.00		5.00		6.00				
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very poor, there is sometimes even not enough food available	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0
Poor, but have no food problems and only sometimes problems buying clothes	2	6.5	9	13.6	3	10.7	0	.0	0	.0	0	.0	14	10.5
Moderate, enough money for food clothes, health care, school	23	74.2	44	66.7	23	82.1	1	33.3	4	100.0	1	100.0	96	72.2
Moderate, enough money even for some luxurious objects like motorbikes, car, computer	6	19.4	13	19.7	2	7.1	2	66.7	0	.0	0	.0	23	17.3
Good, can run a good car, own a good house, have many luxurious objects	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0
Total	31	100.0	66	100.0	28	100.0	3	100.0	4	100.0	1	100.0	133	100.0

Q8

8a.Household assets (1)	Mobile phone		Bicycle		Motorbike		Car or truck		Radio or stereo		TV set and/or DVD		Satellite dish	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	312	87.9	115	32.4	41	11.5	36	10.2	336	94.6	134	37.7	11	3.1
No	43	12.1	240	67.6	314	88.5	318	89.8	19	5.4	221	62.3	343	96.9
Total	355	100.0	355	100.0	355	100.0	354	100.0	355	100.0	355	100.0	354	100.0

8b. Household assets (2)	Refrigerator		Own stand pipe		Own borehole or well		Own water tank		Access to shared well/borehole/stand pipe		Latrine/toilet	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	13	3.7	64	18.0	93	26.2	84	23.6	190	53.4	352	99.2
No	342	96.3	291	82.0	262	73.8	272	76.4	166	46.6	3	.8
Total	355	100.0	355	100.0	355	100.0	356	100.0	356	100.0	355	100.0

Missing values are caused by interviewees not knowing or refusing the answer.

Q9

9a. Main energy resource of household	Frequency	Percent	Valid Percent
Wood	352	98.6	98.6
Charcoal	5	1.4	1.4
Total	357	100.0	100.0

9b. Second main energy resource of household	Frequency	Percent	Valid Percent
Biogas (stove)	2	.6	11.1
Electricity	16	4.5	88.9
Total	18	5.0	100.0

2 households mention to have Solar panel as their third source of energy.

9c.Wood required per week per hh in kg	Statistics
N Valid	340
N Missing	12
Mean	210.9000
Median	140.0000
Minimum	4.00
Maximum	1820.00
Sum	71706.00

The minimum consumption of wood per household in one week is 4kg and a maximum of 1820kg. The average is 210kg per household per week and the median can be found at 140kg per week.

Looking at the per capita consumption in the household the minimum is 0.67kg per week and the maximum 455kg, with a mean average of 49.34kg and 30kg as the median average.

9d. Wood required per week per hh in kg (grouped)	Frequency	Percent	Valid Percent
Up to 25	18	5.1	5.3
26 to 50	39	11.1	11.5
51 to100	62	17.6	18.2
101 to 150	60	17.0	17.6
151 to 200	50	14.2	14.7
201 to 300	60	17.0	17.6
301 to 500	28	8.0	8.2
More than 500	23	6.5	6.8
Total	340	96.6	100.0

9e. Wood required per week per hh member in kg	Statistics
N Valid	340
N Missing	12
Mean	49.3420
Median	30.0000
Minimum	.67
Maximum	455.00
Sum	16776.27

9f. Wood required per week per hh member in kg (grouped)	Frequency	Percent	Valid Percent
Up to 5	28	8.0	8.2
5.1 to 10	38	10.8	11.2
10.1 to 15	43	12.2	12.6
15.1 to 20	28	8.0	8.2
20.1 to 30	39	11.1	11.5
30.1 to 50	62	17.6	18.2
50.1 to 100	59	16.8	17.4
100.1 to 150	26	7.4	7.6
More than 150	17	4.8	5.0
Total	340	96.6	100.0

Q10

10a. Household practicing Agriculture or Livestock	Frequency	Percent	Valid Percent
Cropping only	23	6.4	6.4
Livestock only	6	1.7	1.7
Cropping and Livestock	328	91.9	91.9
Total	357	100.0	100.0

10b. Household practicing Agriculture or Livestock	WOMEN HEADED HOUSEHOLD		
	Frequency	Percent	Valid Percent
Cropping only	4	6.8	6.8
Livestock only	4	6.8	6.8
Cropping and Livestock	51	86.4	86.4
Total	59	100.0	100.0

Q11

11a. Farm assets (1)	Shovel		Hoe		Machete		Plough		Mechanical Plough		Ox or donkey cart		Tractor		Thresher		Biogas digester	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	277	82.4	334	99.7	235	69.9	59	17.6	3	.9	26	7.7	5	1.5	2	.6	2	.6
No	59	17.6	1	.3	101	30.1	277	82.4	333	99.1	310	92.3	331	98.5	334	99.4	334	99.4
Total	336	100.0	335	100.0	336	100.0	336	100.0	336	100.0	336	100.0	336	100.0	336	100.0	336	100.0

11b. Farm assets (2)	Milking parlour		Milking machine		Teat dip		Knap sack sprayer		Separation from animal and human		Barn for livestock		Pulveriser		Chaff cutter	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	151	44.9	2	.6	4	1.2	229	68.2	137	40.9	67	19.9	2	.6	11	3.3
No	185	55.1	334	99.4	332	98.8	107	31.8	198	59.1	269	80.1	334	99.4	325	96.7
Total	336	100.0	336	100.0	336	100.0	336	100.0	335	100.0	336	100.0	336	100.0	336	100.0

Missing values are caused by interviewees not knowing or refusing the answer.

Q12

12a. Statistics of livestock	Number of owned pigs	Number of owned goats	Number of owned sheep	Number of owned chicken	Number of owned cattle	Number of owned donkey
N Valid	0	93	98	238	331	17
N Missing	357	264	259	119	26	340
Mean		4.5806	3.73	11.46	5.46	1.41
Median		3.0000	3.00	10.00	5.00	1.00
Minimum		1.00	1	1	1	1
Maximum		30.00	18	100	22	4
Sum		426.00	366	2727	1808	24

12b. Number of owned goats	Frequency	Percent	Valid Percent
1.00	13	3.6	14.0
2.00	20	5.6	21.5
3.00	16	4.5	17.2
4.00	21	5.9	22.6
5.00	8	2.2	8.6
6.00	1	.3	1.1
7.00	1	.3	1.1
8.00	1	.3	1.1
10.00	7	2.0	7.5
20.00	4	1.1	4.3
30.00	1	.3	1.1
Total	93	26.1	100.0

12c. Number of owned sheep	Frequency	Percent	Valid Percent
1	16	4.5	16.3
2	24	6.7	24.5
3	19	5.3	19.4
4	13	3.6	13.3
5	9	2.5	9.2
6	3	.8	3.1
7	5	1.4	5.1
8	4	1.1	4.1
10	3	.8	3.1
15	1	.3	1.0
18	1	.3	1.0
Total	98	27.5	100.0

12d. Number of owned chicken (grouped)	Frequency	Percent	Valid Percent
Up to 2	19	5.3	8.0
2 to 4	23	6.4	9.7
4 to 6	43	12.0	18.1
6 to 8	20	5.6	8.4
8 to 10	68	19.0	28.6
10 to 15	27	7.6	11.3
15 to 20	18	5.0	7.6
More than 20	20	5.6	8.4
Total	238	66.7	100.0

12e. Number of owned cattle (grouped)	Frequency	Percent	Valid Percent
Up to 2	60	16.8	18.1
2 to 4	100	28.0	30.2
4 to 6	70	19.6	21.1
6 to 8	48	13.4	14.5
8 to 10	27	7.6	8.2
More than 10	26	7.3	7.9
Total	331	92.7	100.0

12f. Number of owned donkey	Frequency	Percent	Valid Percent
1	12	3.4	70.6
2	4	1.1	23.5
4	1	.3	5.9
Total	17	4.8	100.0

12g. Assess economic situation of the household	Number of owned cattle (grouped)												Total	
	Up to 2		2 to 4		4 to 6		6 to 8		8 to 10		More than 10			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Very poor, there is sometimes even not enough food available	3	5.2	1	1.0	0	.0	0	.0	0	.0	0	.0	4	1.2
Poor, but have no food problems and only sometimes problems buying clothes	16	27.6	21	21.6	9	13.2	5	10.6	1	3.7	0	.0	52	16.2
Moderate, enough money for food clothes, health care, school	39	67.2	69	71.1	47	69.1	38	80.9	19	70.4	16	66.7	228	71.0
Moderate, enough money even for some luxurious objects like motorbike, car, computer	0	.0	6	6.2	11	16.2	3	6.4	7	25.9	8	33.3	35	10.9
Good, can run a good car, own a good house, have many luxurious goods	0	.0	0	.0	1	1.5	1	2.1	0	.0	0	.0	2	.6
Total	58	100.0	97	100.0	68	100.0	47	100.0	27	100.0	24	100.0	321	100.0

Q13

13a. Type of breed (1)	Frequency	Percent	Valid Percent
Zebu	3	.8	.9
Aryshire	121	33.9	36.6
Friesian	93	26.1	28.1
Jersey	3	.8	.9
Guernsey	9	2.5	2.7
Friesian cross	50	14.0	15.1
Jersey cross	5	1.4	1.5
Guernsey cross	1	.3	.3
Aryshire cross	46	12.9	13.9
Total	331	92.7	100.0

13b. Type of breed (2)	Frequency	Percent	Valid Percent
Zebu	2	.6	1.0
Boran	1	.3	.5
Aryshire	54	15.1	27.7
Friesian	68	19.0	34.9
Jersey	2	.6	1.0
Guernsey	2	.6	1.0
Friesian cross	37	10.4	19.0
Jersey cross	4	1.1	2.1
Aryshire cross	25	7.0	12.8
Total	195	54.6	100.0

13c. Type of breed (3)	Frequency	Percent	Valid Percent
Aryshire	4	1.1	15.4
Friesian	2	.6	7.7
Guernsey	2	.6	7.7
Friesian cross	5	1.4	19.2
Jersey cross	4	1.1	15.4
Guernsey cross	2	.6	7.7
Aryshire cross	7	2.0	26.9
Total	26	7.3	100.0

13d. Type of breed (4)	Frequency	Percent	Valid Percent
Friesian	2	.6	50.0
Friesian cross	1	.3	25.0
Aryshire cross	1	.3	25.0
Total	4	1.1	100.0

13e. All mentioned breeds	Frequency	Percent
Zebu	5	.9
Boran	1	.2
Aryshire	179	32.2
Friesian	165	29.7
Jersey	5	.9
Guernsey	13	2.3
Friesian cross	93	16.7
Jersey cross	13	2.3
Guernsey cross	3	.5
Aryshire cross	79	14.2
Total	556	100.0

13f. Statistics	Number of pure breed	Number of cross breed
N Valid	240	126
N Missing	117	231
Mean	1.51	1.46
Median	2.00	1.00
Minimum	1	1
Maximum	3	3
Sum	362	184

13g. Number of pure breed	Frequency	Percent	Valid Percent
1	119	33.3	49.6
2	120	33.6	50.0
3	1	.3	.4
Total	240	67.2	100.0

13h. Number of cross breed	Frequency	Percent	Valid Percent
1	72	20.2	57.1
2	50	14.0	39.7
3	4	1.1	3.2
Total	126	35.3	100.0

13i. Statistics	2. Number of bulls	3. Number of oxen	4.a Number of milk cows	4.b Number of cows	5. Number of heifers	6. Number of female calves	7. Number of male calves
N Valid	68	43	298	89	147	222	172
N Missing	289	314	59	268	210	135	185
Mean	1.28	1.67	2.43	1.72	1.67	1.33	1.22
Median	1.00	1.00	2.00	1.00	1.00	1.00	1.00
Minimum	1	1	1	1	1	1	1
Maximum	3	7	8	7	7	4	5
Sum	87	72	724	153	245	295	210

13j. 2 Number of bulls	Frequency	Percent	Valid Percent
1	51	14.3	75.0
2	15	4.2	22.1
3	2	.6	2.9
Total	68	19.0	100.0

13k. 3 Number of oxen	Frequency	Percent	Valid Percent
1	26	7.3	60.5
2	11	3.1	25.6
3	3	.8	7.0
4	2	.6	4.7
7	1	.3	2.3
Total	43	12.0	100.0

13l. 4a Number of milk cows	Frequency	Percent	Valid Percent
1	93	26.1	31.2
2	90	25.2	30.2
3	57	16.0	19.1
4	32	9.0	10.7
5	14	3.9	4.7
6	6	1.7	2.0
7	2	.6	.7
8	4	1.1	1.3
Total	298	83.5	100.0

13m. 4b Number of cows	Frequency	Percent	Valid Percent
1	53	14.8	59.6
2	19	5.3	21.3
3	12	3.4	13.5
4	2	.6	2.2
5	1	.3	1.1
6	1	.3	1.1
7	1	.3	1.1
Total	89	24.9	100.0

13n. 5 Number of heifers	Frequency	Percent	Valid Percent
1	86	24.1	58.5
2	45	12.6	30.6
3	8	2.2	5.4
4	2	.6	1.4
5	2	.6	1.4
6	1	.3	.7
7	3	.8	2.0
Total	147	41.2	100.0

13o. 6 Number of female calves	Frequency	Percent	Valid Percent
1	157	44.0	70.7
2	59	16.5	26.6
3	4	1.1	1.8
4	2	.6	.9
Total	222	62.2	100.0

13p. 7 Number of male calves	Frequency	Percent	Valid Percent
1	141	39.5	82.0
2	26	7.3	15.1
3	4	1.1	2.3
5	1	.3	.6
Total	172	48.2	100.0

13q. Number of all cattle	Statistics
N Valid	329
N Missing	28
Mean	5.4286
Median	4.0000
Minimum	1.00
Maximum	22.00
Sum	1786.00

13r. Number of all cattle	Frequency	Percent	Valid Percent
Up to 1	14	3.9	4.3
1 to 2	49	13.7	14.9
2 to 3	43	12.0	13.1
3 to 4	60	16.8	18.2
4 to 5	31	8.7	9.4
5 to 6	36	10.1	10.9
6 to 8	42	11.8	12.8
8 to 10	25	7.0	7.6
More than 10	29	8.1	8.8
Total	329	92.2	100.0

13s. Statistics	a Average daily amount of milk per cow breed (1)	b Average daily amount of milk per cow breed (2)	c Average daily amount of milk per cow breed (3)
N Valid	291	129	12
N Missing	66	228	345
Mean	4.8041	4.4651	4.2917
Median	5.0000	4.0000	5.0000
Minimum	.50	1.00	1.50
Maximum	16.00	14.00	5.00
Sum	1398.00	576.00	51.50

13s. a Average daily amount of milk per cow breed (1)	Frequency	Percent	Valid Percent
Up to 2 l	36	10.1	12.4
2.1 to 3l	58	16.2	19.9
3.1 to 4l	47	13.2	16.2
4.1 to 5l	76	21.3	26.1
5.1 to 6l	24	6.7	8.2
6.1 to 8l	28	7.8	9.6
8.1 to 10l	13	3.6	4.5
More than 10l	9	2.5	3.1
Total	291	81.5	100.0

13s. b Average daily amount of milk per cow breed (2)	Frequency	Percent	Valid Percent
Up to 2 l	25	7.0	19.4
2.1 to 3l	19	5.3	14.7
3.1 to 4l	32	9.0	24.8
4.1 to 5l	20	5.6	15.5
5.1 to 6l	13	3.6	10.1
6.1 to 8l	14	3.9	10.9
8.1 to 10l	4	1.1	3.1
More than 10l	2	.6	1.6
Total	129	36.1	100.0

13s. c Average daily amount of milk per cow breed (3)	Frequency	Percent	Valid Percent
Up to 2 l	1	.3	8.3
2.1 to 3l	1	.3	8.3
3.1 to 4l	3	.8	25.0
4.1 to 5l	7	2.0	58.3
Total	12	3.4	100.0

13t. a Sell milk of breed (1)	Frequency	Percent	Valid Percent
Zebu	3	.8	1.2
Aryshire	90	25.2	35.3
Friesian	75	21.0	29.4
Jersey	1	.3	.4
Guernsey	4	1.1	1.6
Friesian cross	45	12.6	17.6
Jersey cross	1	.3	.4
Guernsey cross	1	.3	.4
Aryshire cross	35	9.8	13.7
Total	255	71.4	100.0

13t. b Sell milk of breed (2)	Frequency	Percent	Valid Percent
Zebu	1	.3	.9
Boran	1	.3	.9
Aryshire	32	9.0	29.9
Friesian	41	11.5	38.3
Jersey	1	.3	.9
Friesian cross	16	4.5	15.0
Jersey cross	2	.6	1.9
Aryshire cross	13	3.6	12.1
Total	107	30.0	100.0

13t. c Sell milk of breed (3)	Frequency	Percent	Valid Percent
Friesian	1	.3	14.3
Guernsey	2	.6	28.6
Friesian cross	2	.6	28.6
Jersey cross	1	.3	14.3
Guernsey cross	1	.3	14.3
Total	7	2.0	100.0

13u. Reason (1) for variation in average volume of milk per day per cow	Frequency	Percent	Valid Percent
Changes in weather/temperature	43	12.0	21.0
Diseases	2	.6	1.0
Lack of water	5	1.4	2.4
Lactation period	77	21.6	37.6
Quantity/type of feeds	66	18.5	32.2
Feeding concentrates/supplements (increase)	6	1.7	2.9
Drop during rain	5	1.4	2.4
Time of the day	1	.3	.5
Total	205	57.4	100.0

13v. Reason (2) for variation in average volume of milk per day per cow	Frequency	Percent	Valid Percent
Changes in weather/temperature	5	1.4	23.8
Diseases	1	.3	4.8
Lack of water	5	1.4	23.8
Quantity/type of feeds	5	1.4	23.8
Feeding concentrates/supplements (increase)	5	1.4	23.8
Total	21	5.9	100.0

13w Reason (3) for variation in average volume of milk per day per cow	Frequency	Percent	Valid Percent
Quantity/type of feeds	1	.3	100.0
Total	1	.3	100.0

Two cases mentioned when they feed more salt the cattle will drink more water and therefore the milk production will increase.

Q14

14. Location to keep livestock	Frequency	Percent	Valid Percent
On paddocks	212	59.4	63.9
Grazing on communal land	71	19.9	21.4
In barn and on paddocks	3	.8	.9
Grazing communal land and paddocks	6	1.7	1.8
Tethering	33	9.2	9.9
Tethering and paddocks	1	.3	.3
Own open farm	6	1.7	1.8
Total	332	93.0	100.0

Q15

15a. Statistics	1. Plot size (1) in Acres	2. Plot size (2) in Acres	3. Plot size (3) in Acres	4. Plot size (4) in Acres
N Valid	252	170	120	39
N Missing	105	187	237	318
Mean	.48692	.33218	.40642	.2851
Median	.30000	.20000	.20000	.2000
Minimum	.010	.010	.010	.01
Maximum	3.000	1.500	2.500	1.00
Sum	122.705	56.470	48.770	11.12

15b. Plot size (1) in Acres (grouped)	Frequency	Percent	Valid Percent
Up to 0.05	27	7.6	10.7
0.051 to 0.1	40	11.2	15.9
0.11 to 0.25	44	12.3	17.5
0.251 to 0.5	72	20.2	28.6
0.51 to 1	46	12.9	18.3
More than 1	23	6.4	9.1
Total	252	70.6	100.0

15c. Plot size (2) in Acres (grouped)	Frequency	Percent	Valid Percent
Up to 0.05	25	7.0	14.7
0.051 to 0.1	26	7.3	15.3
0.11 to 0.25	36	10.1	21.2
0.251 to 0.5	60	16.8	35.3
0.51 to 1	19	5.3	11.2
More than 1	4	1.1	2.4
Total	170	47.6	100.0

15d. Plot size (3) in Acres (grouped)	Frequency	Percent	Valid Percent
Up to 0.05	22	6.2	18.3
0.051 to 0.1	15	4.2	12.5
0.11 to 0.25	27	7.6	22.5
0.251 to 0.5	33	9.2	27.5
0.51 to 1	15	4.2	12.5
More than 1	8	2.2	6.7
Total	120	33.6	100.0

15e. Plot size (4) in Acres (grouped)	Frequency	Percent	Valid Percent
Up to 0.05	9	2.5	23.1
0.051 to 0.1	4	1.1	10.3
0.11 to 0.25	9	2.5	23.1
0.251 to 0.5	13	3.6	33.3
0.51 to 1	4	1.1	10.3
Total	39	10.9	100.0

15f. Statistics	Average size per cattle on plot (1)	Average size per cattle on plot (2)	Average size per cattle on plot (3)	Average size per cattle on plot (4)
N Valid	250	170	120	39
N Missing	107	187	237	318
Mean	.11654	.074946	.079967	.054367
Median	.08333	.060000	.058571	.050000
Minimum	.002	.0025	.0029	.0029
Maximum	1.500	.3333	1.0000	.1250
Sum	29.135	12.7409	9.5961	2.1203

15g. Average size per cattle on plot (1) (grouped)	Frequency	Percent	Valid Percent
Up to 0.01	27	7.6	10.8
0.011 to 0.025	19	5.3	7.6
0.0251 to 0.05	47	13.2	18.8
0.051 to 0.075	26	7.3	10.4
0.0751 to 0.1	41	11.5	16.4
0.101 to 0.15	30	8.4	12.0
0.151 to 0.3	45	12.6	18.0
More than 0.3	15	4.2	6.0
Total	250	70.0	100.0

15h. Average size per cattle on plot (2) (grouped)	Frequency	Percent	Valid Percent
Up to 0.01	26	7.3	15.3
0.011 to 0.025	13	3.6	7.6
0.0251 to 0.05	42	11.8	24.7
0.051 to 0.075	25	7.0	14.7
0.0751 to 0.1	28	7.8	16.5
0.101 to 0.15	22	6.2	12.9
0.151 to 0.3	13	3.6	7.6
More than 0.3	1	.3	.6
Total	170	47.6	100.0

15i. Average size per cattle on plot (3) (grouped)	Frequency	Percent	Valid Percent
Up to 0.01	23	6.4	19.2
0.011 to 0.025	11	3.1	9.2
0.0251 to 0.05	24	6.7	20.0
0.051 to 0.075	23	6.4	19.2
0.0751 to 0.1	17	4.8	14.2
0.101 to 0.15	12	3.4	10.0
0.151 to 0.3	5	1.4	4.2
More than 0.3	5	1.4	4.2
Total	120	33.6	100.0

15j. Average size per cattle on plot (4) (grouped)	Frequency	Percent	Valid Percent
Up to 0.01	9	2.5	23.1
0.011 to 0.025	4	1.1	10.3
0.0251 to 0.05	7	2.0	17.9
0.051 to 0.075	7	2.0	17.9
0.0751 to 0.1	8	2.2	20.5
0.101 to 0.15	4	1.1	10.3
Total	39	10.9	100.0

15k. Size of all paddocks (in acres)	Frequency	Percent	Valid Percent
Up to 0.1	33	9.2	13.1
0.101 to 0.25	35	9.8	13.9
0.251 to 0.5	39	10.9	15.5
0.501 to 1	68	19.0	27.0
1.01 to 1.5	36	10.1	14.3
1.501 to 3	30	8.4	11.9
More than 3	11	3.1	4.4
Total	252	70.6	100.0

15l. Number of all cattle	Size of all paddocks (in acres)														Total	
	Up to 0.1		0.101 to 0.25		0.251 to 0.5		0.501 to 1		1.01 to 1.5		1.501 to 3		More than 3			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Up to 1	4	12.1	2	5.9	2	5.3	1	1.5	0	.0	0	.0	0	.0	9	3.6
1 to 2	8	24.2	10	29.4	5	13.2	5	7.4	1	2.8	2	6.7	0	.0	31	12.4
2 to 3	7	21.2	2	5.9	8	21.1	10	14.7	3	8.3	1	3.3	0	.0	31	12.4
3 to 4	4	12.1	9	26.5	8	21.1	14	20.6	6	16.7	2	6.7	1	9.1	44	17.6
4 to 5	2	6.1	3	8.8	2	5.3	11	16.2	2	5.6	4	13.3	0	.0	24	9.6
5 to 6	4	12.1	4	11.8	3	7.9	5	7.4	7	19.4	3	10.0	1	9.1	27	10.8
6 to 8	1	3.0	3	8.8	5	13.2	11	16.2	10	27.8	4	13.3	1	9.1	35	14.0
8 to 10	1	3.0	1	2.9	4	10.5	5	7.4	5	13.9	5	16.7	2	18.2	23	9.2
More than 10	2	6.1	0	.0	1	2.6	6	8.8	2	5.6	9	30.0	6	54.5	26	10.4
Total	33	100.0	34	100.0	38	100.0	68	100.0	36	100.0	30	100.0	11	100.0	250	100.0

Q16

16a. Overall amount of produced milk per day (in litres)	Statistics
N Valid	308
N Missing	49
Mean	9.8344
Median	9.0000
Minimum	1.00
Maximum	48.00
Sum	3029.00

16b. Overall amount of produced milk per day (in litres)	Frequency	Percent	Valid Percent
Up to 2	18	5.0	5.8
2.1 to 4	31	8.7	10.1
4.1 to 6	51	14.3	16.6
6.1 to 8	51	14.3	16.6
8.1 to 10	54	15.1	17.5
10.1 to 12	29	8.1	9.4
12.1 to 16	41	11.5	13.3
16.1 to 201	18	5.0	5.8
More than 20	15	4.2	4.9
Total	308	86.3	100.0

16c. Overall amount of produced milk per day (in litres)	PROJECT PARTICIPANTS	NON-PARTICIPANTS
N Valid	135	172
N Missing	0	49
Mean	11.4963	8.4477
Median	10.0000	8.0000
Minimum	1.50	1.00
Maximum	40.00	48.00
Sum	1552.00	1453.00

16d. Overall amount of produced milk per day (in litres)	PROJECT PARTICIPANTS		NON-PARTICIPANTS	
	Frequency	Valid Percent	Frequency	Valid Percent
Up to 2	4	3.0	14	8.1
2.1 to 4	7	5.2	24	14.0
4.1 to 6	17	12.6	34	19.8
6.1 to 8	24	17.8	27	15.7
8.1 to 10	23	17.0	31	18.0
10.1 to 12	14	10.4	15	8.7
12.1 to 16	23	17.0	18	10.5
16.1 to 201	12	8.9	6	3.5
More than 20	11	8.1	3	1.7
Total	135	100.0	172	100.0

16e. Overall amount of produced milk per day (in litres)	WOMEN HEADED HH
N Valid	51
N Missing	8
Mean	11.2647
Median	10.0000
Minimum	2.00
Maximum	40.00
Sum	574.50

16f. Overall amount of produced milk per day (in litres)	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Up to 2	2	3.4	3.9
2.1 to 4	4	6.8	7.8
4.1 to 6	10	16.9	19.6
6.1 to 8	5	8.5	9.8
8.1 to 10	9	15.3	17.6
10.1 to 12	6	10.2	11.8
12.1 to 16	6	10.2	11.8
16.1 to 201	5	8.5	9.8
More than 20	4	6.8	7.8
Total	51	86.4	100.0

Q17

17a. Use of milk	1. Sell milk		2. Use for own consumption		3. Give a way for free		4. Conserve as Murzik		5. Conserve as Lala		6. Produce other milk based products (yoghurt)		7. Sell other milk based products (Lala, Murzik, yoghurt)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	262	83.4	310	98.7	20	6.4	32	10.2	.0	.0	.0	.0	.0	.0
No	52	16.6	4	1.3	294	93.6	282	89.8	314	100.0	314	100.0	314	100.0
Total	314	100.0	314	100.0	314	100.0	314	100.0	314	100.0	314	100.0	314	100.0

43 cases do not have milk or did not answer this question.

17b. Statistics	1. Amount of sold milk (in litres, daily)	2. Amount of milk for own consumption (in litres, daily)	3. Amount of milk given away (in litres, daily)	4. Amount of milk given away (in litres, daily)	5. Amount of milk used to conserve milk as Lala (in litres, daily)	6. Amount of milk used for other milk based products (yoghurt)	7.Amount of milk sold as other milk based products
N Valid	255	296	19	26	0	0	0
N Missing	102	61	338	331	357	357	357
Mean	7.2569	3.2348	1.7105	2.1154			
Median	6.0000	3.0000	1.0000	1.5000			
Minimum	.50	.50	.50	1.00			
Maximum	40.00	13.00	5.00	7.00			
Sum	1850.50	957.50	32.50	55.00			

17b.1 Amount of sold milk (in litres, daily)	Frequency	Percent	Valid Percent
Up to 2	22	6.2	8.6
2.1 to 4	58	16.2	22.7
4.1 to 6	62	17.4	24.3
6.1 to 8	47	13.2	18.4
8.1 to 10	27	7.6	10.6
10.1 to 12	9	2.5	3.5
12.1 to 16	17	4.8	6.7
More than 16	13	3.6	5.1
Total	255	71.4	100.0

17b.2 Amount of milk for own consumption (in litres, daily)	Frequency	Percent	Valid Percent
Up to 1	32	9.0	10.8
1.1 to 2	103	28.9	34.8
2.1 to 3	67	18.8	22.6
3.1 to 4	22	6.2	7.4
4.1 to 6	52	14.6	17.6
More than 6	20	5.6	6.8
Total	296	82.9	100.0

17b.3 Amount of milk given away (in litres, daily)	Frequency	Percent	Valid Percent
.50	2	.6	10.5
1.00	8	2.2	42.1
1.50	1	.3	5.3
2.00	5	1.4	26.3
3.00	1	.3	5.3
4.00	1	.3	5.3
5.00	1	.3	5.3
Total	19	5.3	100.0

17b.4 Amount of milk used to conserve for Murzik (in litres, daily)	Frequency	Percent	Valid Percent
1.00	13	3.6	50.0
2.00	6	1.7	23.1
3.00	3	.8	11.5
4.00	2	.6	7.7
6.00	1	.3	3.8
7.00	1	.3	3.8
Total	26	7.3	100.0

17c. Statistics	1. Ratio of sold milk of overall milk (in %, per day)	2. Ratio of own consumed milk of overall milk (in %, per day)	3. Ratio of milk given away of overall milk (in %, per day)	4. Ratio of milk used for Murzik of overall milk (in %, per day)
N Valid	255	295	19	26
N Missing	102	62	338	331
Mean	65.0903	41.1586	17.2556	19.4274
Median	66.6667	33.3333	14.2857	15.4762
Minimum	.13	3.57	4.17	3.33
Maximum	100.00	200.00	40.00	50.00
Sum	16598.02	12141.77	327.86	505.11

17c.1 Ratio of sold milk of overall milk (in %, per day) (grouped)	Frequency	Percent	Valid Percent
Up to 40	23	6.4	9.0
40.01 to 50	30	8.4	11.8
50.01 to 60	39	10.9	15.3
60.01 to 70	66	18.5	25.9
70.01 to 80	65	18.2	25.5
80.01 to 90	26	7.3	10.2
More than 90	6	1.7	2.4
Total	255	71.4	100.0

3 household mention to sell 100% of their produced milk.

17d. 2 Ratio of own consumed milk of overall milk (in %, per day)	Frequency	Percent	Valid Percent
Up to 10	10	2.8	3.4
10.01 to 20	54	15.1	18.3
20.01 to 30	60	16.8	20.3
30.01 to 40	76	21.3	25.8
40.01 to 50	37	10.4	12.5
50.01 to 70	19	5.3	6.4
70.01 90	7	2.0	2.4
More than 90	32	9.0	10.8
Total	295	82.6	100.0

31 cases mention to consume 100% of their produced milk.

17d.3 Ratio of milk given away of overall milk (in %, per day)	Frequency	Percent	Valid Percent
4.17	1	.3	5.3
6.67	1	.3	5.3
8.33	1	.3	5.3
10.00	5	1.4	26.3
12.50	1	.3	5.3
14.29	1	.3	5.3
15.00	1	.3	5.3
20.00	3	.8	15.8
25.00	1	.3	5.3
28.57	1	.3	5.3
30.00	1	.3	5.3
33.33	1	.3	5.3
40.00	1	.3	5.3
Total	19	5.3	100.0

17d.4 Ratio of milk used for Murzik of overall milk (in %, per day)	Frequency	Percent	Valid Percent
3.33	1	.3	3.8
6.67	1	.3	3.8
7.69	3	.8	11.5
8.33	2	.6	7.7
11.11	1	.3	3.8
11.54	1	.3	3.8
12.50	1	.3	3.8
13.33	2	.6	7.7
14.29	1	.3	3.8
16.67	2	.6	7.7
20.00	4	1.1	15.4
22.22	1	.3	3.8
23.08	1	.3	3.8
33.33	1	.3	3.8
42.86	1	.3	3.8
44.44	1	.3	3.8
50.00	2	.6	7.7
Total	26	7.3	100.0

17e. Sell milk	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Yes	43	72.9	82.7
No	9	15.3	17.3
Total	52	88.1	100.0

17f. Use for own consumption	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Yes	51	86.4	98.1
No	1	1.7	1.9
Total	52	88.1	100.0

17g. Give a way for free	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Yes	3	5.1	5.8
No	49	83.1	94.2
Total	52	88.1	100.0

17h. Conserve as Murzik	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Yes	9	15.3	17.3
No	43	72.9	82.7
Total	52	88.1	100.0

Q18

18a. Statistics	Monthly income from sold milk (in KSH)
N Valid	260
N Missing	97
Mean	6224.7115
Median	5000.0000
Minimum	400.00
Maximum	30000.00
Sum	1618425.00

18b. Monthly income from sold milk (in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 2000	49	13.7	18.8
2001 to 3000	31	8.7	11.9
3001 to 4000	27	7.6	10.4
4001 to 6000	42	11.8	16.2
6001 to 8000	37	10.4	14.2
8001 to 10000	39	10.9	15.0
10001 to 14000	20	5.6	7.7
More than 14000	15	4.2	5.8
Total	260	72.8	100.0

18c. Monthly income from sold milk (in KSH)	PROJECT PARTICIPANTS	NON-PARTICIPANTS
N Valid	122	137
N Missing	13	84
Mean	6806.5984	5744.4526
Median	5860.0000	4500.0000
Minimum	840.00	400.00
Maximum	27000.00	30000.00
Sum	830405.00	786990.00

18d. Monthly income from sold milk (in KSH) (grouped)	PROJECT PARTICIPANTS		NON-PARTICIPANTS	
	Frequency	Valid Percent	Frequency	Valid Percent
Up to 2000	20	16.4	28	20.4
2001 to 3000	14	11.5	17	12.4
3001 to 4000	9	7.4	18	13.1
4001 to 6000	20	16.4	22	16.1
6001 to 8000	18	14.8	19	13.9
8001 to 10000	21	17.2	18	13.1
10001 to 14000	11	9.0	9	6.6
More than 14000	9	7.4	6	4.4
Total	122	100.0	137	100.0

18e. Monthly income from sold milk (in KSH) (grouped)	WOMEN HEADED HH
N Valid	43
N Missing	16
Mean	6318.8372
Median	5000.0000
Minimum	1000.00
Maximum	18000.00
Sum	271710.00

18f. Monthly income from sold milk (in KSH) (grouped)	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Up to 2000	12	20.3	27.9
2001 to 3000	2	3.4	4.7
3001 to 4000	6	10.2	14.0
4001 to 6000	5	8.5	11.6
6001 to 8000	8	13.6	18.6
8001 to 10000	3	5.1	7.0
10001 to 14000	2	3.4	4.7
More than 14000	5	8.5	11.6
Total	43	72.9	100.0

Q19

19a. Feeding fresh grass	Frequency	Percent	Valid Percent
Yes	290	81.2	100.0
Total	290	81.2	100.0

19b. Ratio of fresh grass in daily food (in %)	Frequency	Percent	Valid Percent
20.00	1	.3	1.1
60.00	1	.3	1.1
65.00	2	.6	2.2
70.00	9	2.5	10.1
75.00	2	.6	2.2
80.00	25	7.0	28.1
85.00	3	.8	3.4
90.00	33	9.2	37.1
95.00	6	1.7	6.7
98.00	3	.8	3.4
100.00	4	1.1	4.5
Total	89	24.9	100.0

Enumerators had difficulties to analyse the daily ratio of food components which lead to a decreased sample size for those questions.

19c. Fresh grass fed to	Frequency	Percent	Valid Percent
Milk cow	5	1.4	1.7
Heifer	1	.3	.3
All	282	79.0	97.9
Total	288	80.7	100.0

19d. Self produced fresh grass	Frequency	Percent	Valid Percent
Yes	281	78.7	100.0
Total	281	78.7	100.0

19e. Need to buy fresh grass	Frequency	Percent	Valid Percent
Yes	6	1.7	100.0
Total	6	1.7	100.0

19f. Weekly price in KSH for fresh grass	Frequency	Percent	Valid Percent
60.00	1	.3	16.7
75.00	1	.3	16.7
150.00	1	.3	16.7
200.00	1	.3	16.7
400.00	1	.3	16.7
500.00	1	.3	16.7
Total	6	1.7	100.0

Only one farmer stated to require about 150kg of fresh grass per week per cattle.

19g. Feeding Napier Grass	Frequency	Percent	Valid Percent
Yes	214	59.9	100.0
Total	214	59.9	100.0

19h. Ratio of Napier Grass	Frequency	Percent	Valid Percent
2.00	1	.3	1.5
4.00	1	.3	1.5
5.00	4	1.1	6.1
7.00	1	.3	1.5
8.00	5	1.4	7.6
9.00	6	1.7	9.1
10.00	24	6.7	36.4
15.00	13	3.6	19.7
18.00	1	.3	1.5
19.00	2	.6	3.0
20.00	6	1.7	9.1
25.00	1	.3	1.5
70.00	1	.3	1.5
Total	66	18.5	100.0

19i. Napier Grass fed to	Frequency	Percent	Valid Percent
Milk cow	51	14.3	24.2
Heifer	1	.3	.5
Female Calves	1	.3	.5
All	158	44.3	74.9
Total	211	59.1	100.0

19j. Self produced Napier Grass	Frequency	Percent	Valid Percent
Yes	214	59.9	100.0
Total	214	59.9	100.0

None of the 214 households feeding Napier grass does not need to buy Napier Grass.

19k. All required Napier grass in kg	Statistics
N Valid	175
N Missing	182
Mean	224.2514
Median	120.0000
Minimum	2.00
Maximum	1800.00
Sum	39244.00

19l. All required Napier grass in kg (grouped)	Frequency	Percent	Valid Percent
Up to 50	11	3.1	6.3
51 to 75	24	6.7	13.7
76 to 100	50	14.0	28.6
101 to 150	19	5.3	10.9
151 to 300	34	9.5	19.4
301 to 600	25	7.0	14.3
More than 600	12	3.4	6.9
Total	175	49.0	100.0

19.3 Kikuyu Grass

Only 3 households feed Kikuyu grass to their cattle; one feed milk cows, two households feed it to all their cattle; the amount are 45kg, 3 bags and 1 wheel barrow.

19.4 Hay

Eight farmers feed hay to their cattle; 2 are feeding their milk cows and 6 all their cattle with it. Five households produce their own hay. Only three could recall the required amount: 3 wheel barrow,

60kg and 7 bundles of hay. Three need to buy it (two pay 800 KSH per sack and one pays 8000KSH but can not recall the amount).

19.5 Lucerne

Only two households are feeding lucerne (to their milk cows) and produce it themselves. One interviewee could not estimate the required weekly amount, the other mentioned requiring 8kg per week.

19.6 Dismodium

The same two households that planted and fed lucerne to their milk cows are the same households who plant and feed dismodium to their milk cows. It is self produced and one of the required 7kg per week whereas the other interviewee could not recall the exact amount fed to his cattle.

19.7 Fodder legume

Four households feed fodder legume to their cattle (one only to milk cows, other three to all cattle type) and produce it themselves. Only 2 households shared the required amount with the enumerators: 3 kg and 7bags.

19.8. Fodder trees

None of the interviewed farmers is feeding fruits or leaves from fodder trees.

19m. Feeding crop residue	Frequency	Percent	Valid Percent
Yes	115	32.2	100.0
Total	115	32.2	100.0

19n. Ratio of crop residue	Frequency	Percent	Valid Percent
2.00	1	.3	2.9
3.00	1	.3	2.9
4.00	4	1.1	11.4
5.00	3	.8	8.6
8.00	2	.6	5.7
9.00	8	2.2	22.9
10.00	7	2.0	20.0
14.00	1	.3	2.9
15.00	4	1.1	11.4
19.00	4	1.1	11.4
Total	35	9.8	100.0

19o. Crop residue fed to	Frequency	Percent	Valid Percent
Milk cow	10	2.8	8.8
All	103	28.9	91.2
Total	113	31.7	100.0

2 households need to buy crop residue and pay 100 KSH and 750 KSH per week.

19p. Feeding concentrates	Frequency	Percent	Valid Percent
Yes	89	24.9	100.0
Total	89	24.9	100.0

One farmer feeds about 2% the other about 8% of overall daily food with concentrate.

19q. Concentrates fed to	Frequency	Percent	Valid Percent
Milk cow	45	12.6	51.7
All	42	11.8	48.3
Total	87	24.4	100.0

19r. Need to buy concentrates	Frequency	Percent	Valid Percent
Yes	73	20.4	100.0
Total	73	20.4	100.0

19s. Self produced concentrates	Frequency	Percent	Valid Percent
Yes	16	4.5	100.0
Total	16	4.5	100.0

Two households mentioned producing their concentrate from (1) molasses (for the milk cows, buying 1.25l for 250KSh and requiring 10l for one week) and (2) sweet potato vines

One farmer makse his concentrate of maize/whole meal (80%) and dairy meal (20%).

19t. Weekly price of concentrates in KSH	Statistics
N Valid	65
N Missing	292
Mean	380.7538
Median	150.0000
Minimum	25.00
Maximum	3000.00
Sum	24749.00

19u. Weekly price of concentrates in KSH (grouped)	Frequency	Percent	Valid Percent
Up to 50	5	1.4	7.7
51 to 100	16	4.5	24.6
101 to 150	12	3.4	18.5
151 to 300	11	3.1	16.9
301 to 600	11	3.1	16.9
More than 600	10	2.8	15.4
Total	65	18.2	100.0

19v. Feeding supplements	Frequency	Percent	Valid Percent
Yes	272	76.2	100.0
Total	272	76.2	100.0

19w. Ratio of supplements (in %)	Frequency	Percent	Valid Percent
1.00	44	12.3	53.7
2.00	10	2.8	12.2
5.00	25	7.0	30.5
10.00	3	.8	3.7
Total	82	23.0	100.0

19x. Supplements fed to	Frequency	Percent	Valid Percent
Milk cow	44	12.3	16.4
Heifer	1	.3	.4
All	224	62.7	83.3
Total	269	75.4	100.0

19y. Need to buy supplements	Frequency	Percent	Valid Percent
Yes	270	75.6	100.0
Total	270	75.6	100.0

Only two mentioned producing supplements themselves.

19z. Weekly amount of supplements required Statistics	Statistics
N Valid	261
N Missing	96
Mean	1.3813
Median	1.0000
Minimum	.05
Maximum	6.00
	360.53

19z1. Weekly amount of supplements required (in kg)	Frequency	Percent	Valid Percent
.05	2	.6	.8
.10	1	.3	.4
.13	1	.3	.4
.20	1	.3	.4
.25	8	2.2	3.1
.40	1	.3	.4
.50	63	17.6	24.1
.70	3	.8	1.1
1.00	59	16.5	22.6
1.50	5	1.4	1.9
2.00	105	29.4	40.2
2.50	1	.3	.4
3.00	4	1.1	1.5
4.00	3	.8	1.1
5.00	3	.8	1.1
6.00	1	.3	.4
Total	261	73.1	100.0

19z2. Weekly price of supplements in KSH	Statistics
N Valid	259
N Missing	98
Mean	132.0000
Median	100.0000
Minimum	8.00
Maximum	600.00
Sum	34188.00

19z3. Weekly price of supplements in KSH (grouped)	Frequency	Percent	Valid Percent
Up to 25	21	5.9	8.1
25.1 to 50	64	17.9	24.7
50.1 to 100	57	16.0	22.0
100.1 to 150	22	6.2	8.5
150.1 to 200	27	7.6	10.4
200.1 to 250	12	3.4	4.6
250.01 to 300	50	14.0	19.3
More than 300	6	1.7	2.3
Total	259	72.5	100.0

Q20:

Only one household produces their own concentrate (see above)

Q21

21a. First reason for not producing fodder	Frequency	Percent	Valid Percent
Crop failed	2	.6	1.5
No need	3	.8	2.2
Lack of knowledge	12	3.4	8.8
Grazing is enough	9	2.5	6.6
Insufficient land	76	21.3	55.5
Lack of finances	27	7.6	19.7
Lack of time/labour	4	1.1	2.9
No cows	2	.6	1.5
Lack of seeds	1	.3	.7
New in farming	1	.3	.7
Total	137	38.4	100.0

21b. Second reason for not producing fodder	Frequency	Percent	Valid Percent
Lack of knowledge	4	1.1	26.7
Insufficient land	3	.8	20.0
Lack of finances	5	1.4	33.3
Lack of seeds	1	.3	6.7
New in farming	1	.3	6.7
Other	1	.3	6.7
Total	15	4.2	100.0

21c. First reason for not producing fodder by location	Location												Total	
	Kaptumo		Ndurio		Kapkolei		Koyo		Kapsaos		Kaboi			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Crop failed	1	6.3	0	.0	0	.0	1	3.6	0	.0	0	.0	2	1.5
No need	0	.0	0	.0	1	3.3	1	3.6	1	7.1	0	.0	3	2.2
Lack of knowledge	1	6.3	5	16.7	3	10.0	0	.0	0	.0	3	15.8	12	8.8
Grazing is enough	2	12.5	0	.0	0	.0	3	10.7	0	.0	4	21.1	9	6.6
Insufficient land	7	43.8	15	50.0	20	66.7	13	46.4	10	71.4	11	57.9	76	55.5
Lack of finances	3	18.8	10	33.3	5	16.7	7	25.0	2	14.3	0	.0	27	19.7
Lack of time/labour	0	.0	0	.0	1	3.3	3	10.7	0	.0	0	.0	4	2.9
No cows	0	.0	0	.0	0	.0	0	.0	1	7.1	1	5.3	2	1.5
Lack of seeds	1	6.3	0	.0	0	.0	0	.0	0	.0	0	.0	1	.7
New in farming	1	6.3	0	.0	0	.0	0	.0	0	.0	0	.0	1	.7
Total	16	100.0	30	100.0	30	100.0	28	100.0	14	100.0	19	100.0	137	100.0

21d. Second reason for not producing fodder by location	Location												Total	
	Kaptumo		Ndurio		Kapkolei		Koyo		Kapsaos		Kaboi			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Lack of knowledge	0	.0	0	.0	2	40.0	2	50.0	0	.0	0	.0	4	26.7
Insufficient land	0	.0	0	.0	1	20.0	2	50.0	0	.0	0	.0	3	20.0
Lack of finances	2	100.0	0	.0	1	20.0	0	.0	1	100.0	1	33.3	5	33.3
Lack of seeds	0	.0	0	.0	1	20.0	0	.0	0	.0	0	.0	1	6.7
New in farming	0	.0	0	.0	0	.0	0	.0	0	.0	1	33.3	1	6.7
Other	0	.0	0	.0	0	.0	0	.0	0	.0	1	33.3	1	6.7
Total	2	100.0	0	.0	5	100.0	4	100.0	1	100.0	3	100.0	15	100.0

Q22

22a. Use of manure (1)	1. On own field		2. Sell to others		3. Discard in surrounding areas		4. Use as fuel		5. Use as biogas/bioenergy	
	N	%	N	%	N	%	N	%	N	%
Yes	312	95.4	11	3.3	123	37.3	4	1.2	3	.9
No	15	4.6	318	96.7	207	62.7	326	98.8	326	99.1
Total	327	100.0	329	100.0	330	100.0	330	100.0	329	100.0

22b. Use of manure (2)	6. Apply to fodder		7. Construction material		8. Compost it		9. Pile and dry it	
	N	%	N	%	N	%	N	%
Yes	217	65.8	249	75.5	14	4.2	9	2.7
No	113	34.2	81	24.5	316	95.8	321	97.3
Total	330	100.0	330	100.0	330	100.0	330	100.0

Q23

23a. Use Artificial Insemination	Frequency	Percent	Valid Percent
Yes	62	17.4	18.8
No	268	75.1	81.2
Total	330	92.4	100.0

23b. Type of breed of the cow used AI on (1)	Frequency	Percent	Valid Percent
Aryshire	24	6.7	39.3
Friesian	28	7.8	45.9
Friesian cross	4	1.1	6.6
Jersey cross	1	.3	1.6
Aryshire cross	4	1.1	6.6
Total	61	17.1	100.0

23c. Frequency of AI on breed (type 1) in last 12 months	Frequency	Percent	Valid Percent
1.00	40	11.2	65.6
2.00	14	3.9	23.0
3.00	4	1.1	6.6
4.00	3	.8	4.9
Total	61	17.1	100.0

23d. Type of breed of the cow used AI on (2)	Frequency	Percent	Valid Percent
Aryshire	10	2.8	41.7
Friesian	8	2.2	33.3
Friesian cross	4	1.1	16.7
Aryshire cross	2	.6	8.3
Total	24	6.7	100.0

23e. Frequency of AI on breed (type 2) in last 12 months	Frequency	Percent	Valid Percent
1.00	16	4.5	69.6
2.00	4	1.1	17.4
3.00	2	.6	8.7
5.00	1	.3	4.3
Total	23	6.4	100.0

| 23f . Frequency of AI in last 12 months | Breed AI used on | | | | | | | | | | Total | |
| | Aryshire | | Friesian | | Friesian cross | | Jersey cross | | Aryshire cross | | | |
	N	%	N	%	N	%	N	%	N	%	N	%
1	35	7.3	32	60.4	9	64.3	1	100.0	7	63.6	56	66.7
2	11	21.2	14	26.41	3	21.4	0	.0	4	36.4	18	21.4
3	4	7.7	4	7.5	1	7.1	0	.0	0	.0	6	7.1
4	1	2	2	3.8	1	7.1	0	.0	0	.0	3	3.6
5	1	2	1	1.9	0	.0	0	.0	0	.0	1	1.2
Total	52	100.0	53	100.0	14	100.0	1	100.0	11	100.0	84	100.0

Q24

24. Practice cropping	Frequency	Percent	Valid Percent
Yes	350	98.0	98.9
No	4	1.1	1.1
Total	354	99.2	100.0

Q25

| 25a. Type of cropping | 1. Practice Horticulture/ gardening | | 2. Cultivating one main field | | 3. Cultivating several fields | | 4. Cultivating communal land | | 5. Planting and harvesting trees | | 6. Cultivating on group fields | | 7. Cultivating on own field | |
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	287	81.3	113	32.3	115	32.6	2	.6	95	26.9	8	2.3	341	96.6
No	66	18.7	240	67.7	238	67.4	351	99.4	258	73.1	344	97.7	12	3.4
Total	353	100.0	353	100.0	353	100.0	353	100.0	353	100.0	352	100.0	353	100.0

25b. Type of cropping	8. Cultivating on leased field		9. Subsistence farming only		10. Selling crops only		11. Own consumption and selling of crops		12. Shifting Cultivation		13. Harvest bushes and fruits	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	27	7.6	12	3.4	1	.3	338	95.8	68	19.3	48	13.6
No	326	92.4	341	96.6	352	99.7	15	4.2	285	80.7	305	86.4
Total	353	100.0	353	100.0	353	100.0	353	100.0	353	100.0	353	100.0

Q26

26a. Experiencing problems regarding Agriculture	Frequency	Percent	Valid Percent
Yes	310	86.8	87.8
No	43	12.0	12.2
Total	353	98.9	100.0

26b. First problem in regard to Agriculture	Frequency	Percent	Valid Percent
Diseases	95	26.6	30.6
Lack/poor seeds	59	16.5	19.0
Lack of knowledge/training	25	7.0	8.1
Expensive inputs	24	6.7	7.7
Lack of finances	20	5.6	6.5
Animal diseases	16	4.5	5.2
Low yields	12	3.4	3.9
Lack of market	8	2.2	2.6
Crop diseases	7	2.0	2.3
Hailstorm	7	2.0	2.3
No access to AI	6	1.7	1.9
Changes in weather	5	1.4	1.6
Insufficient feeds	4	1.1	1.3
More rain	4	1.1	1.3
Lack of land	3	.8	1.0
Natural calamities	3	.8	1.0
Lack of farm inputs	2	.6	.6
Invasion of cattle	2	.6	.6
Lack of water	2	.6	.6
Destruction of crops	1	.3	.3
Other	5	1.4	1.6
Total	310	86.8	100.0

26c. Second problem in regard to Agriculture	Frequency	Percent	Valid Percent
Lack/poor seeds	24	6.7	19.8
Diseases	17	4.8	14.0
Expensive inputs	16	4.5	13.2
Crop diseases	12	3.4	9.9
Lack of knowledge/training	9	2.5	7.4
Lack of market	7	2.0	5.8
Low yields	5	1.4	4.1
Lack of farm inputs	4	1.1	3.3
Hailstorm	4	1.1	3.3
Destruction of crops	3	.8	2.5
Lack of finances	3	.8	2.5
Lack of land	3	.8	2.5
Natural calamities	3	.8	2.5
No access to AI	2	.6	1.7
Insufficient feeds	2	.6	1.7
Lack of water	2	.6	1.7
Animal diseases	1	.3	.8
More rain	1	.3	.8
Other	3	.8	2.5
Total	121	33.9	100.0

26d. Third problem in regard to Agriculture	Frequency	Percent	Valid Percent
Diseases	2	.6	28.6
Animal diseases	1	.3	14.3
Crop diseases	1	.3	14.3
Changes in weather	1	.3	14.3
Expensive inputs	1	.3	14.3
Lack/poor seeds	1	.3	14.3
Total	7	2.0	100.0

26e. All mentioned problems in regard to Agriculture	Frequency	Percent	Valid Percent
Animal diseases	18	4.1	5.8
Crop diseases	20	4.6	6.5
Diseases	114	26.0	36.8
No access to AI	8	1.8	2.6
Changes in weather	6	1.	1.9
Destruction of crops	4	.9	1.3
Expensive inputs	41	9.4	13.2
Lack of farm inputs	6	1.4	1.9
Lack of knowledge/training	34	7.8	11.0
Insufficient feeds	6	1.	1.9
Invasion of cattle	2	.5	.6
Lack of finances	23	5.3	7.4
Lack of land	6	1.4	1.9
Lack of market	15	3.4	4.8
Low yields	17	3.9	5.5
Lack/poor seeds	84	19.2	27.1
Lack of water	4	.9	1.3
Hailstorm	11	2.5	3.5
More rain	5	1.1	1.6
Natural calamities	6	1.4	1.9
Other	8	1.8	2.6
Total	438	100.0	141.3

Q27

27. Any knowledge on conservation agriculture	Frequency	Percent	Valid Percent
Yes	313	87.7	88.9
No	39	10.9	11.1
Total	352	98.6	100.0

Q28

28a. Cropping techniques	1. Practice double digging		2. Practice mulching		3. Avoid slash and burn		4. Practice crop rotation		5. Planting in rows		6. Planting hedge rows		7. Planting crop cover		8. Application of manure	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	189	58.7	168	52.2	164	50.9	270	83.9	293	91.0	291	91.2	192	59.6	291	90.4
No	133	41.3	154	47.8	158	49.1	52	16.1	29	9.0	28	8.8	130	40.4	31	9.6
Total	322	100.0	322	100.0	322	100.0	322	100.0	322	100.0	319	100.0	322	100.0	322	100.0

28b. Cropping techniques	9. Application of fertilizer*		10. Timely weeding		11. Weeding using chemicals		12. Bush clearing		13. Minimum tillage		14. Ridge cultivation		15. Terraces	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	314	97.5	260	80.7	227	70.5	170	52.8	264	82.0	302	93.8	233	72.4
No	8	2.5	62	19.3	95	29.5	152	47.2	58	18.0	20	6.2	89	27.6
Total	322	100.0	322	100.0	322	100.0	322	100.0	322	100.0	322	100.0	322	100.0

One farmer mentioned planting better grass.

Note: Application of fertilizer was meant to stand for 'organic fertilizer' but from the data it must be assumed that interviewees meant inorganic fertilizers.

Q29

29. Who decided to use those techniques?	Frequency	Percent	Valid Percent
Father	179	50.1	59.1
Mother	83	23.2	27.4
Father and Mother	34	9.5	11.2
Son	3	.8	1.0
Daughter	2	.6	.7
Grandmother	2	.6	.7
Total	303	84.9	100.0

Q30

30a. Techniques that have benefited cropping	Frequency	Percent	Valid Percent
Application of fertilizer	73	20.4	23.6
Crop rotation	72	20.2	23.3
Terraces	64	17.9	20.7
Application of manure	54	15.1	17.5
Timely weeding	18	5.0	5.8
Mulching	7	2.0	2.3
Avoid slash and burn	7	2.0	2.3
Planting in rows	5	1.4	1.6
Double digging	3	.8	1.0
Crop cover	2	.6	.6
Bush clearing	2	.6	.6
Planting Hedge rows	1	.3	.3
Weeding using chemicals	1	.3	.3
Total	309	86.6	100.0

30b. Techniques that have benefited livestock	Frequency	Percent	Valid Percent
Application of manure	73	20.4	28.6
Terraces	64	17.9	25.1
Bush clearing	48	13.4	18.8
Other	27	7.6	10.6
Avoid slash and burn	14	3.9	5.5
Planting in rows	8	2.2	3.1
Application of fertilizer	8	2.2	3.1
Mulching	4	1.1	1.6
Planting Hedge rows	3	.8	1.2
Crop cover	2	.6	.8
Double digging	1	.3	.4
Crop rotation	1	.3	.4
Timely weeding	1	.3	.4
Good feeding	1	.3	.4
Total	255	71.4	100.0

27 farmers added that proper feeding and fodder production have the best benefit for livestock.

Q31

31a. All planted crops	Frequency	Percent
Beans	206	14.9
Potatoes	64	4.6
Maize	320	23.2
Tea	167	12.1
Onion	12	.9
Vegetables	90	6.5
Avocado	87	6.3
Bananas	168	12.2
Cabbage	38	2.8
Kales	21	1.5
Napier Grass	107	7.8
Cypress	1	.1
Fruits trees	3	.2
Passion fruits	15	1.1
Sweet potatoes	11	.8
Pumpkin	1	.1
Sugar cane	11	.8
Tomatoes	10	.7
Yams	4	.3
Trees	1	.1
Pineapple	3	.2
Lemon	2	.1
Guavas	2	.1
Coffee	31	2.2
Sorghum	3	.2
Total	1378	100.0

357 households mentioned all together 1 378 different types of crops. 279 households have up to 6 crops, 33 households have up to 7 crops and 7 households mentioned even 8 different crops planted on their land.

31b. All sizes of planted crops	Frequency	Percent
Up to 0.05	266	20.2
0.051 to 0.1	218	16.6
0.101 to 0.25	184	14.0
0.251 to 0.5	305	23.2
0.501 to 0.75	46	3.5
0.751 to 1	161	12.3
1.001 to 1.5	33	2.5
1.501 to 2	58	4.4
More than 2	43	3.3
Total	1314	100

31c. Overall size of all crops planted	Statistics
Valid	350
Missing	7
Mean	2.1997
Median	1.5000
Minimum	.03
Maximum	20.59
Sum	769.90

31d. Overall size of all crops planted	Frequency	Percent	Valid Percent
Up to 0.25	50	14.0	14.3
0.251 to 0.5	24	6.7	6.9
0.501 to 1	50	14.0	14.3
1.001 to 1.5	56	15.7	16.0
1.501 to 2	40	11.2	11.4
2.001 to 3	57	16.0	16.3
3.001 to 5	44	12.3	12.6
More than 5	29	8.1	8.3
Total	350	98.0	100.0

31e. All crops manure is being applied to	Frequency	Percent
Beans	40	8.2
Potatoes	15	3.1
Maize	45	9.2
Tea	6	1.2
Onion	2	.4
Vegetables	67	13.8
Avocado	19	3.9
Bananas	133	27.3
Cabbage	10	2.1
Kales	10	2.1
Napier Grass	103	21.1
Fruits trees	1	.2
Passion fruits	13	2.7
Sweet potatoes	3	.6
Pumpkin	1	.2
Sugar cane	1	.2
Tomatoes	4	.8
Yams	3	.6
Pineapple	1	.2
Lemon	1	.2
Coffee	7	1.4
Sorghum	2	.4
Total	487	99.9

31f. All crops fertilizer being applied to	Frequency	Percent
Beans	162	22.6
Potatoes	47	6.6
Maize	267	37.2
Tea	145	20.2
Onion	2	.3
Vegetables	17	2.4
Avocado	1	.1
Bananas	7	1.0
Cabbage	31	4.3
Kales	10	1.4
Napier Grass	1	.1
Fruits trees	1	.1
Passion fruits	3	.4
Tomatoes	3	.4
Trees	1	.1
Lemon	1	.1
Coffee	17	2.4
Sorghum	1	.1
Total	717	100

31g. All crops herbicides being applied to	Frequency	Percent
Beans	17	11.9
Potatoes	11	7.7
Maize	24	16.8
Tea	55	38.5
Onion	1	.7
Vegetables	8	5.6
Bananas	6	4.2
Kales	3	2.1
Passion fruits	2	1.4
Tomatoes	1	.7
Trees	1	.7
Coffee	14	9.8
Total	143	100

31h. All crops pesticides being applied to	Frequency	Percent
Beans	118	33.4
Potatoes	49	13.9
Maize	48	13.6
Tea	17	4.8
Onion	4	1.1
Vegetables	47	13.3
Bananas	5	1.4
Cabbage	36	10.2
Kales	9	2.5
Napier Grass	1	.3
Passion fruits	6	1.7
Tomatoes	8	2.3
Trees	1	.3
Coffee	4	1.1
Total	353	99.9

31i. All crops being used as fodder	Frequency	Percent
Beans	2	1.2
Maize	36	21.4
Tea	1	.6
Bananas	16	9.5
Kales	1	.6
Napier Grass	111	66.1
Sorghum	1	.6
Total	168	100

31j. All crops its residue used as fodder		Percent
Beans	137	26.6
Potatoes	11	2.1
Maize	230	44.7
Tea	1	.2
Vegetables	20	3.9
Avocado	1	.2
Bananas	101	19.6
Cabbage	2	.4
Kales	2	.4
Napier Grass	2	.4
Sweet potatoes	5	1.0
Coffee	1	.2
Sorghum	2	.4
Total	515.0	100

31k. All annual yield in kg	Statistics
Valid	343
Missing	14
Mean	6645.3426
Median	3410.0000
Minimum	45.00
Maximum	90450.00
Sum	2279352.50

14 respondents do not have cropping or no yield in last 12 months

31l. All annual yield in kg	Frequency	Percent	Valid Percent
Up to 500	25	7.0	7.3
501 to 1000	38	10.6	11.1
1001 to 1500	30	8.4	8.7
1501 to 2000	32	9.0	9.3
2001 to 2500	16	4.5	4.7
2501 to 5000	72	20.2	21.0
5001 to 7500	41	11.5	12.0
7501 to 10000	27	7.6	7.9
10001 to 15000	32	9.0	9.3
More than 15000	30	8.4	8.7
Total	343	96.1	100.0

31m. All annual yield in kg	PROJECT PARTICIPANTS	NON-PARTICIPANTS
Valid	133	209
Missing	2	12
Mean	7757.4211	5966.0072
Median	4730.0000	2790.0000
Minimum	45.00	100.00
Maximum	76800.00	90450.00
Sum	1031737.00	1246895.50

31n. All annual yield in kg PROJECT PARTICIPANTS	Frequency	Percent	Valid Percent
Up to 500	10	7.4	7.5
501 to 1000	10	7.4	7.5
1001 to 1500	5	3.7	3.8
1501 to 2000	11	8.1	8.3
2001 to 2500	3	2.2	2.3
2501 to 5000	31	23.0	23.3
5001 to 7500	19	14.1	14.3
7501 to 10000	11	8.1	8.3
10001 to 15000	18	13.3	13.5
More than 15000	15	11.1	11.3
Total	133	98.5	100.0

31o. All annual yield in kg NON-PROJECT PARTICIPANTS	Frequency	Percent	Valid Percent
Up to 500	15	6.8	7.2
501 to 1000	27	12.2	12.9
1001 to 1500	25	11.3	12.0
1501 to 2000	21	9.5	10.0
2001 to 2500	13	5.9	6.2
2501 to 5000	41	18.6	19.6
5001 to 7500	22	10.0	10.5
7501 to 10000	16	7.2	7.7
10001 to 15000	14	6.3	6.7
More than 15000	15	6.8	7.2
Total	209	94.6	100.0

31p. All crops being sold	Frequency	Percent
Beans	156	16.0
Potatoes	58	6.0
Maize	189	19.4
Tea	169	17.4
Onion	11	1.1
Vegetables	44	4.5
Avocado	71	7.3
Bananas	135	13.9
Cabbage	43	4.4
Kales	21	2.2
Cypress	1	.1
Fruits trees	3	.3
Passion Fruits	7	.7
Sweet potatoes	6	.6
Sugar cane	7	.7
Tomatoes	10	1.0
yams	3	.3
Trees	1	.1
Pineapple	2	.2
Lemon	1	.1
Guavas	1	.1
Coffee	31	3.2
Sorghum	3	.3
Total	973	100

31q. Revenues from all sold crops (by crops) in KSH	Frequency	Percent
Up to 2500	114	12.1
2501 to 5000	96	10.2
5001 to 10000	182	19.4
10001 to 25000	272	28.9
25001 to 50000	121	12.9
50001 to 100000	65	6.9
100001 to 200000	44	4.7
More than 200000	46	4.9
Total	940	100100.0

100

31r. All annual revenue from all sold crops in KSH	Statistics
Valid	332
Missing	25
Mean	212019.7651
Median	62000.0000
Minimum	500.00
Maximum	6027700.00
Sum	70390562.00

31s. All annual revenue from all sold crops (grouped) in KSH	Frequency	Percent	Valid Percent
Up to 10000	45	12.6	13.6
10001 to 25000	51	14.3	15.4
25001 to 50000	50	14.0	15.1
50001 to75000	40	11.2	12.0
75001 to 100000	38	10.6	11.4
100001 to 250000	55	15.4	16.6
250001 to 500000	26	7.3	7.8
More than 500000	27	7.6	8.1
Total	332	93.0	100.0

Only one household mentions to intercrop two types of crops: bananas and sweet potatoes

31t. All annual revenue from all sold crops	PROJECT PARTICIPANTS	NON PARTICIPANTS
Valid	127	204
Missing	8	17
Mean	338988.5197	133909.4118
Median	83000.0000	55550.0000
Minimum	1500.00	500.00
Maximum	6027700.00	2023500.00
Sum	43051542.00	27317520.00

31u. All annual revenue from all sold crops (grouped)	PROJECT PARTICIPANTS		NON PARTICIPANTS	
	Frequency	Valid Percent	Frequency	Valid Percent
Up to 10000	9	7.1	36	17.6
10001 to 25000	19	15.0	31	15.2
25001 to 50000	16	12.6	34	16.7
50001 to75000	16	12.6	24	11.8
75001 to 100000	17	13.4	21	10.3
100001 to 250000	17	13.4	38	18.6
250001 to 500000	15	11.8	11	5.4
More than 500000	18	14.2	9	4.4
Total	127	100.0	204	100.0

Q32

32. Use of soil conditioner	Frequency	Percent	Valid Percent
Yes	5	1.4	1.6
No	310	86.8	98.4
Total	315	88.2	100.0

All five cases mention to use lime as a soil conditioner and only once a year.

Q33

33a. All other agricultural product	Frequency	Percent
Honey	22	19.1304348
Fish	1	0.86956522
Sheep	5	4.34782609
Chicken	23	20
Goats	5	4.34782609
Seedlings	1	0.86956522
Bananas	1	0.86956522
Rabbits	1	0.86956522
Eggs	56	48.6956522
Total	115	100

85 households mention at least one other agricultural product, 27 households have at least 2 additional agricultural goods and 3 household mention a third agricultural good.

33b. All locations of additional agricultural products	Frequency	Percent
Own field	62	59.0
Own garden	22	21.0
Group field	1	1.0
At home	20	19.0
Total	105	100

33c. All other sold products	Frequency	Percent
Honey	15	15.2
Fish	1	1.0
Sheep	5	5.1
Chicken	20	20.2
Goats	5	5.1
Seedlings	1	1.0
Rabbits	1	1.0
Eggs	51	51.5
Total	99	100.1

33d. Annual revenue from all other agricultural products in KSH (grouped)	Statistics
Valid	71
Missing	286
Mean	9142.6761
Median	6000.0000
Minimum	560.00
Maximum	70000.00
Sum	649130.00

33e. Annual revenue from all other agricultural products in KSH (grouped)	Frequency	Percent	Valid Percent
Up to 1500	6	1.7	8.5
1501 to 2500	13	3.6	18.3
2501 to 5000	13	3.6	18.3
5001 to 7500	9	2.5	12.7
7501 to 10000	12	3.4	16.9
10001 to 20000	11	3.1	15.5
More than 20000	7	2.0	9.9
Total	71	19.9	100.0

Q34

34. Overall size of land used for crops (in Acres) (grouped)	Frequency	Percent	Valid Percent
Up to 0.25	12	3.4	3.5
0.251 to 0.5	21	5.9	6.1
0.501 to 1	61	17.1	17.7
1.001 to 1.5	57	16.0	16.6
1.501 to 2	55	15.4	16.0
2.001 to 3	60	16.8	17.4
3.001 to 5	48	13.4	14.0
More than 5	30	8.4	8.7
Total	344	96.4	100.0

Q35

35a. Plant or protect tress	Frequency	Percent	Valid Percent
Yes	278	77.9	79.0
No	74	20.7	21.0
Total	352	98.6	100.0

35b. First type of tree(s) planted	Frequency	Percent	Valid Percent
Cypress	39	10.9	14.0
Gravelia	6	1.7	2.2
Nandi Flame	8	2.2	2.9
Indigenous Trees	72	20.2	25.9
Blue gum	54	15.1	19.4
Eucalyptus	83	23.2	29.9
Avocado	3	.8	1.1
Bottle brush	11	3.1	4.0
Mahogany	1	.3	.4
Jacaranda	1	.3	.4
Total	278	77.9	100.0

35c. Second type of tree(s) planted	Frequency	Percent	Valid Percent
Cypress	42	11.8	23.6
Gravelia	9	2.5	5.1
Nandi Flame	6	1.7	3.4
Indigenous Trees	81	22.7	45.5
Fruit trees	1	.3	.6
Blue gum	23	6.4	12.9
Eucalyptus	13	3.6	7.3
Avocado	1	.3	.6
Bottle brush	1	.3	.6
Pinus	1	.3	.6
Total	178	49.9	100.0

35d. Third type of tree(s) planted	Frequency	Percent	Valid Percent
Cypress	11	3.1	15.9
Gravelia	3	.8	4.3
Nandi Flame	2	.6	2.9
Indigenous Trees	40	11.2	58.0
Blue gum	10	2.8	14.5
Eucalyptus	1	.3	1.4
Pinus	1	.3	1.4
Jacaranda	1	.3	1.4
Total	69	19.3	100.0

35e. All type of tree(s) planted	Frequency	Percent
Cypress	92	17.5
Gravelia	18	3.4
Nandi Flame	16	3.0
Indigenous Trees	193	36.8
Fruit trees	1	.2
Blue gum	87	16.6
Eucalyptus	97	18.5
Avocado	4	.8
Bottle brush	12	2.3
Pinus	2	.4
Mahogany	1	.2
Jacaranda	2	.4
Total	525	100.0

35f. Number of different types of trees	Frequency	Percent	Valid Percent
1.00	100	28.0	36.4
2.00	108	30.3	39.3
3.00	67	18.8	24.4
Total	275	77.0	100.0

35g. Number of tree(s) planted for type 1	Frequency	Percent	Valid Percent
Up to 5	33	9.2	17.5
6 to 10	38	10.6	20.1
11 to 25	36	10.1	19.0
26 to 50	28	7.8	14.8
51 to 100	25	7.0	13.2
101 to 200	15	4.2	7.9
More than 200	14	3.9	7.4
Total	189	52.9	100.0

35h. Number of tree(s) planted for type 2	Frequency	Percent	Valid Percent
Up to 5	37	10.4	32.5
6 to 10	34	9.5	29.8
11 to 25	13	3.6	11.4
26 to 50	16	4.5	14.0
51 to 100	8	2.2	7.0
101 to 200	1	.3	.9
More than 200	5	1.4	4.4
Total	114	31.9	100.0

35i. Number of tree(s) planted for type 3	Frequency	Percent	Valid Percent
Up to 5	10	2.8	31.3
6 to 10	10	2.8	31.3
11 to 25	4	1.1	12.5
26 to 50	3	.8	9.4
51 to 100	2	.6	6.3
101 to 200	2	.6	6.3
More than 200	1	.3	3.1
Total	32	9.0	100.0

35j. All planted trees	Statistics
Valid	205
Missing	152
Mean	117.7073
Median	30.0000
Minimum	1.00
Maximum	3000.00
Sum	24130.00

35k. All planted trees	Frequency	Percent	Valid Percent
Up to 5	24	6.7	11.7
6 to 10	25	7.0	12.2
11 to 25	50	14.0	24.4
26 to 50	35	9.8	17.1
51 to 100	28	7.8	13.7
101 to 200	25	7.0	12.2
More than 200	18	5.0	8.8
Total	205	57.4	100.0

35l. First type of tree(s) planted	All planted trees														Total	
	Up to 5		6 to 10		11 to 25		26 to 50		51 to 100		101 to 200		More than 200			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gravelia	0	.0	1	4.0	2	4.0	1	2.9	0	.0	2	8.0	0	.0	6	2.9
Nandi Flame	3	12.5	3	12.0	1	2.0	0	.0	0	.0	0	.0	0	.0	7	3.4
Indigenous Trees	6	25.0	6	24.0	8	16.0	10	28.6	1	3.6	3	12.0	4	22.2	38	18.5
Blue gum	5	20.8	4	16.0	14	28.0	4	11.4	4	14.3	5	20.0	2	11.1	38	18.5
Eucalyptus	2	8.3	7	28.0	13	26.0	18	51.4	15	53.6	9	36.0	9	50.0	73	35.6
Avocado	1	4.2	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	.5
Bottle brush	1	4.2	2	8.0	3	6.0	0	.0	0	.0	1	4.0	0	.0	7	3.4
Mahogany	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	5.6	1	.5
Jacaranda	1	4.2	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	.5
Total	24	100.0	25	100.0	50	100.0	35	100.0	28	100.0	25	100.0	18	100.0	205	100.0

35m. Second type of tree(s) planted	All planted trees														Total	
	Up to 5		6 to 10		11 to 25		26 to 50		51 to 100		101 to 200		More than 200			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Cypress	7	36.8	5	31.3	7	21.9	4	22.2	1	7.1	5	29.4	3	27.3	32	25.2
Gravelia	0	.0	0	.0	0	.0	0	.0	5	35.7	1	5.9	0	.0	6	4.7
Nandi Flame	1	5.3	0	.0	2	6.3	0	.0	0	.0	1	5.9	0	.0	4	3.1
Indigenous Trees	9	47.4	7	43.8	16	50.0	10	55.6	3	21.4	4	23.5	4	36.4	53	41.7
Fruit trees	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	9.1	1	.8
Blue gum	1	5.3	3	18.8	7	21.9	3	16.7	1	7.1	1	5.9	0	.0	16	12.6
Eucalyptus	1	5.3	0	.0	0	.0	1	5.6	4	28.6	5	29.4	2	18.2	13	10.2
Avocado	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	9.1	1	.8
Pinus	0	.0	1	6.3	0	.0	0	.0	0	.0	0	.0	0	.0	1	.8
Total	19	100.0	16	100.0	32	100.0	18	100.0	14	100.0	17	100.0	11	100.0	127	100.0

35n. Third type of tree(s) planted	All planted trees														Total	
	Up to 5		6 to 10		11 to 25		26 to 50		51 to 100		101 to 200		More than 200			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Cypress	0	.0	1	20.0	1	7.7	0	.0	0	.0	4	80.0	1	25.0	7	17.1
Gravelia	0	.0	0	.0	0	.0	0	.0	0	.0	1	20.0	0	.0	1	2.4
Indigenous Trees	3	100.0	2	40.0	8	61.5	6	75.0	3	100.0	0	.0	2	50.0	24	58.5
Blue gum	0	.0	1	20.0	4	30.8	2	25.0	0	.0	0	.0	0	.0	7	17.1
Pinus	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	25.0	1	2.4
Jacaranda	0	.0	1	20.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	2.4
Total	3	100.0	5	100.0	13	100.0	8	100.0	3	100.0	5	100.0	4	100.0	41	100.0

35o. All protected trees	Statistics
Valid	124
Missing	233
Mean	39.6532
Median	10.0000
Minimum	1.00
Maximum	600.00
Sum	4917.00

35p. All protected trees	Frequency	Percent	Valid Percent
Up to 5	43	12.0	34.7
6 to 10	24	6.7	19.4
11 to 25	19	5.3	15.3
26 to 50	16	4.5	12.9
51 to 100	7	2.0	5.6
101 to 200	11	3.1	8.9
More than 200	4	1.1	3.2
Total	124	34.7	100.0

| 35q.First type of tree(s) planted | All protected trees | | | | | | | | | | | | | | Total | |
| | Up to 5 | | 6 to 10 | | 11 to 25 | | 26 to 50 | | 51 to 100 | | 101 to 200 | | More than 200 | | | |
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Cypress	8	18.6	3	12.5	1	5.3	2	12.5	2	28.6	0	.0	0	.0	16	12.9
Gravelia	0	.0	2	8.3	1	5.3	0	.0	0	.0	1	9.1	0	.0	4	3.2
Nandi Flame	2	4.7	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	2	1.6
Indigenous Trees	18	41.9	9	37.5	8	42.1	1	6.3	1	14.3	2	18.2	1	25.0	40	32.3
Blue gum	5	11.6	5	20.8	4	21.1	2	12.5	0	.0	1	9.1	0	.0	17	13.7
Eucalyptus	3	7.0	5	20.8	5	26.3	8	50.0	4	57.1	6	54.5	3	75.0	34	27.4
Avocado	2	4.7	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	2	1.6
Bottle brush	4	9.3	0	.0	0	.0	3	18.8	0	.0	1	9.1	0	.0	8	6.5
Jacaranda	1	2.3	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	.8
Total	43	100.0	24	100.0	19	100.0	16	100.0	7	100.0	11	100.0	4	100.0	124	100.0

| 35r. Second type of tree(s) planted | All protected trees | | | | | | | | | | | | | | Total | |
| | Up to 5 | | 6 to 10 | | 11 to 25 | | 26 to 50 | | 51 to 100 | | 101 to 200 | | More than 200 | | | |
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Cypress	9	31.0	2	15.4	1	7.1	3	30.0	0	.0	1	16.7	1	50.0	17	21.5
Gravelia	1	3.4	0	.0	2	14.3	1	10.0	2	40.0	1	16.7	0	.0	7	8.9
Nandi Flame	0	.0	2	15.4	0	.0	0	.0	0	.0	1	16.7	0	.0	3	3.8
Indigenous Trees	16	55.2	9	69.2	8	57.1	5	50.0	0	.0	2	33.3	1	50.0	41	51.9
Fruit trees	0	.0	0	.0	0	.0	0	.0	0	.0	1	16.7	0	.0	1	1.3
Blue gum	1	3.4	0	.0	3	21.4	0	.0	0	.0	0	.0	0	.0	4	5.1
Eucalyptus	1	3.4	0	.0	0	.0	1	10.0	3	60.0	0	.0	0	.0	5	6.3
Bottle brush	1	3.4	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	1.3
Total	29	100.0	13	100.0	14	100.0	10	100.0	5	100.0	6	100.0	2	100.0	79	100.0

35s. Third type of tree(s) planted	All protected trees													Total	
	Up to 5		6 to 10		11 to 25		26 to 50		51 to 100		101 to 200		More than 200			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Cypress	2	22.2	0	.0	1	50.0	0	.0	1	33.3	1	50.0	0	.0	5	20.0
Gravelia	0	.0	0	.0	0	.0	0	.0	1	33.3	0	.0	0	.0	1	4.0
Indigenous Trees	3	33.3	6	100.0	1	50.0	2	100.0	1	33.3	1	50.0	1	100.0	15	60.0
Blue gum	2	22.2	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	2	8.0
Eucalyptus	1	11.1	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	4.0
Jacaranda	1	11.1	0	.0	0	.0	0	.0	0	.0	0	.0	0	.0	1	4.0
Total	9	100.0	6	100.0	2	100.0	2	100.0	3	100.0	2	100.0	1	100.0	25	100.0

35t.1 Plant or protect tress PROJECT PARTICIPANTS	Frequency	Percent	Valid Percent
Yes	110	81.5	83.3
No	22	16.3	16.7
Total	132	97.8	100.0

35u. Planning to protect trees in future	Frequency	Percent	Valid Percent
Yes	71	19.9	100.0
Total	71	19.9	100.0

Q36

36a. All sold goods at market	Frequency	Percent
Beans	97	13.1
Potatoes	46	6.2
Maize	89	12.1
Tea	82	11.1
Onion	6	.8
Vegetables	34	4.6
Avocado	29	3.9
Bananas	100	13.6
Chicks/Chicken	18	2.4
Milk	132	17.9
Cabbages	19	2.6
Kales	10	1.4
Passions	8	1.1
Sweet Potatoes	3	.4
Rabbits	1	.1
Honey	4	.5
Goat	2	.3
Sugarcane	3	.4
Eggs	31	4.2
Coffee	16	2.2
Sorghum	3	.4
Tomato	5	.7
Total	738	100.0

333 Households sell at least one good at the market, 239 households can sell two goods, 131 households can sell 3 and 35 households can sell 4 goods at market.

36.b Frequency of going to market (self)	Frequency	Percent
twice a year	184	35.2
every three weeks	39	7.5
every second month	19	3.6
monthly	29	5.6
Every second week	27	5.2
every week	59	11.3
twice a week	13	2.5
daily	113	21.6
Once a year	38	7.3
Three times a year	1	.2
Total	522	100

36c. Frequency of middle man going to market	Frequency	Percent
twice a year	57	27.3
every three weeks	54	25.8
every second month	6	2.9
monthly	5	2.4
every second week	7	3.3
every week	22	10.5
daily	33	15.8
Once a year	25	12.0
Total	209	100

36d. Distance both ways in Km to market 1 (in km)	Frequency	Percent	Valid Percent
Up to 0.5	28	7.8	9.3
0.51 to 1	37	10.4	12.3
1.01 to 2	28	7.8	9.3
2.01 to 4	47	13.2	15.7
4.01 to 6	38	10.6	12.7
6.01 to 8	42	11.8	14.0
8.01 to 10	36	10.1	12.0
10.01 to 20	28	7.8	9.3
More than 20	16	4.5	5.3
Total	300	84.0	100.0

15 Households are selling goods from their homestead and therefore entered 0km as a distance.

36e. Distance both ways in Km to market 2 (in km	Frequency	Percent	Valid Percent
Up to 0.5	16	4.5	7.8
0.51 to 1	22	6.2	10.7
1.01 to 2	17	4.8	8.3
2.01 to 4	30	8.4	14.6
4.01 to 6	28	7.8	13.6
6.01 to 8	26	7.3	12.6
8.01 to 10	25	7.0	12.1
10.01 to 20	24	6.7	11.7
More than 20	18	5.0	8.7
Total	206	57.7	100.0

14 Households are selling goods from their homestead and therefore entered 0km as a distance.

36f. Mode of transport to market 1	Frequency	Percent	Valid Percent
Foot	89	24.9	28.6
Bicycle	9	2.5	2.9
Motor bike	111	31.1	35.7
Car	78	21.8	25.1
Minibus	1	.3	.3
Truck	14	3.9	4.5
Donkey cart	9	2.5	2.9
Total	311	87.1	100.0

36g. Mode of transport to market 2	Frequency	Percent	Valid Percent
Foot	52	14.6	24.6
Bicycle	3	.8	1.4
Motor bike	70	19.6	33.2
Car	65	18.2	30.8
Minibus	1	.3	.5
Truck	12	3.4	5.7
Donkey cart	8	2.2	3.8
Total	211	59.1	100.0

36h. Distance both ways to market 1 (in km)	Mode of transport to market 1														Total	
	Foot		Bicycle		Motor bike		Car		Minibus		Truck		Donkey cart			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Up to 0.5	25	30.5	0	.0	1	.9	1	1.3	0	.0	1	7.1	0	.0	28	9.4
0.51 to 1	25	30.5	0	.0	6	5.6	4	5.2	0	.0	1	7.1	1	11.1	37	12.4
1.01 to 2	14	17.1	1	11.1	8	7.5	2	2.6	0	.0	2	14.3	1	11.1	28	9.4
2.01 to 4	10	12.2	4	44.4	22	20.6	7	9.1	0	.0	2	14.3	1	11.1	46	15.4
4.01 to 6	8	9.8	4	44.4	14	13.1	8	10.4	0	.0	1	7.1	3	33.3	38	12.7
6.01 to 8	0	.0	0	.0	32	29.9	9	11.7	0	.0	0	.0	1	11.1	42	14.0
8.01 to 10	0	.0	0	.0	15	14.0	19	24.7	0	.0	1	7.1	1	11.1	36	12.0
10.01 to 20	0	.0	0	.0	8	7.5	14	18.2	1	100.0	4	28.6	1	11.1	28	9.4
More than 20	0	.0	0	.0	1	.9	13	16.9	0	.0	2	14.3	0	.0	16	5.4
Total	82	100.0	9	100.0	107	100.0	77	100.0	1	100.0	14	100.0	9	100.0	299	100.0

36i. Distance both ways to market 2 (in km)	Mode of transport to market 2														Total	
	Foot		Bicycle		Motor bike		Car		Minibus		Truck		Donkey cart		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Up to 0.5	15	34.9	0	.0	0	.0	1	1.6	0	.0	0	.0	0	.0	16	8.1
0.51 to 1	8	18.6	0	.0	6	8.8	7	10.9	0	.0	0	.0	1	14.3	22	11.1
1.01 to 2	5	11.6	1	33.3	8	11.8	1	1.6	0	.0	1	8.3	0	.0	16	8.1
2.01 to 4	8	18.6	1	33.3	11	16.2	5	7.8	0	.0	1	8.3	1	14.3	27	13.6
4.01 to 6	6	14.0	1	33.3	8	11.8	8	12.5	0	.0	2	16.7	2	28.6	27	13.6
6.01 to 8	0	.0	0	.0	18	26.5	4	6.3	0	.0	1	8.3	0	.0	23	11.6
8.01 to 10	0	.0	0	.0	8	11.8	15	23.4	0	.0	1	8.3	1	14.3	25	12.6
10.01 to 20	0	.0	0	.0	8	11.8	12	18.8	0	.0	4	33.3	0	.0	24	12.1
More than 20	1	2.3	0	.0	1	1.5	11	17.2	1	100.0	2	16.7	2	28.6	18	9.1
Total	43	100.0	3	100.0	68	100.0	64	100.0	1	100.0	12	100.0	7	100.0	198	100.0

Q37

37. Hired staff/laborer in the last 12 months	Frequency	Percent	Valid Percent
Yes	132	37.0	37.9
No	216	60.5	62.1
Total	348	97.5	100.0

Q38

38a. Number of permanent hired female staff	Statistics
Valid	14
Missing	343
Mean	1.9286
Median	1.5000
Minimum	1.00
Maximum	6.00
Sum	27.00

38b. Number of permanent hired female staff	Frequency	Percent	Valid Percent
1.00	7	2.0	50.0
2.00	4	1.1	28.6
3.00	2	.6	14.3
6.00	1	.3	7.1
Total	14	3.9	100.0

38c. Task of permanent hired female staff	Frequency	Percent	Valid Percent
Tea plucking	12	3.4	85.7
Milking and herding	1	.3	7.1
House help	1	.3	7.1
Total	14	3.9	100.0

38d. Number of hired casual labour - female (days per year)	Statistics
Valid	42
Missing	315
Mean	230.6190
Median	156.0000
Minimum	6.00
Maximum	1440.00
Sum	9686.00

38e. Number of hired casual labour - female (days per year)	Frequency	Percent	Valid Percent
Up to 24	3	.8	7.1
25 to 48	8	2.2	19.0
49 to 120	7	2.0	16.7
121 to 240	8	2.2	19.0
241 to 360	9	2.5	21.4
361 to 480	4	1.1	9.5
More than 480	3	.8	7.1
Total	42	11.8	100.0

38f. Task of hired casual labour - female	Frequency	Percent	Valid Percent
Tea plucking	34	9.5	79.1
Weeding and planting	1	.3	2.3
Weeding	7	2.0	16.3
Harvesting and weeding	1	.3	2.3
Total	43	12.0	100.0

38g. Number of permanent hired male staff	Statistics
Valid	63
Missing	294
Mean	1.2540
Median	1.0000
Minimum	1.00
Maximum	4.00
Sum	79.00

38h. Number of permanent hired male staff	Frequency	Percent	Valid Percent
1.00	52	14.6	82.5
2.00	7	2.0	11.1
3.00	3	.8	4.8
4.00	1	.3	1.6
Total	63	17.6	100.0

38i. Task of permanent hired male staff	Frequency	Percent	Valid Percent
Tea plucking	6	1.7	9.5
Weeding and planting	1	.3	1.6
Weeding	3	.8	4.8
Herding	40	11.2	63.5
General farming	9	2.5	14.3
Plucking and weeding	1	.3	1.6
Herding and plucking	3	.8	4.8
Total	63	17.6	100.0

38j. Number of hired casual labour - male (days per year)	Statistics
Valid	72
Missing	285
Mean	231.3472
Median	120.0000
Minimum	8.00
Maximum	2880.00
Sum	16657.00

38k. Number of hired casual labour - male (days per year)	Frequency	Percent	Valid Percent
Up to 24	6	1.7	8.3
25 to 48	11	3.1	15.3
49 to 120	20	5.6	27.8
121 to 240	13	3.6	18.1
241 to 360	14	3.9	19.4
361 to 480	4	1.1	5.6
More than 480	4	1.1	5.6
Total	72	20.2	100.0

38l. Task of hired casual labour - male	Frequency	Percent	Valid Percent
Tea plucking	42	11.8	57.5
Weeding and planting	1	.3	1.4
Weeding	10	2.8	13.7
Harvesting and weeding	4	1.1	5.5
Plucking and weeding	1	.3	1.4
Milking and feeding	1	.3	1.4
Digging and weeding	4	1.1	5.5
Digging	3	.8	4.1
Harvesting	2	.6	2.7
Plucking and digging	2	.6	2.7
Coffee plucking and weeding	3	.8	4.1
Total	73	20.4	100.0

None of the interviewed households hires girls or boys less than 14 years of age.

Q39

39a. Able to provide food for family	Frequency	Percent	Valid Percent
Yes	282	79.0	79.7
Sometimes	70	19.6	19.8
Never	2	.6	.6
Total	354	99.2	100.0

39b. Months able to provide food	Frequency	Percent	Valid Percent
1-3 months per year	14	3.9	4.0
Up to 6 months per year	35	9.8	9.9
Up to 9 months per year	66	18.5	18.6
The whole year	142	39.8	40.1
Even more than a year	1	.3	.3
Very irregular	96	26.9	27.1
Total	354	99.2	100.0

Q40

40a. Have food or fodder storage device	Frequency	Percent	Valid Percent
Yes	233	65.3	66.0
No	120	33.6	34.0
Total	353	98.9	100.0
Yes	233	65.3	66.0

40b. Type of food storage	Frequency	Percent	Valid Percent
Wooden granary/storage	128	35.9	92.1
Wooden storage and iron sheets	5	1.4	3.6
Thatched granary	3	.8	2.2
Iron and cement storage	1	.3	.7
Mud storage	1	.3	.7
Other	1	.3	.7
Total	139	38.9	100.0

40c. Capacity of the food storage (in kg)	Statistics
Valid	128
Missing	229
Mean	3697.3438
Median	1800.0000
Minimum	180.00
Maximum	54000.00
Sum	473260.00

40d. Capacity of the food storage (in kg)	Frequency	Percent	Valid Percent
Up to 500	4	1.1	3.1
501 to 1000	22	6.2	17.2
1001 to 1500	11	3.1	8.6
1501 to 2000	36	10.1	28.1
2001 to 3000	17	4.8	13.3
3001 to 6000	22	6.2	17.2
6001 to 120000	16	4.5	12.5
Total	128	35.9	100.0

40e. Type of fodder storage	Frequency	Percent	Valid Percent
Wooden granary/storage	11	3.1	91.7
Wooden storage and iron sheets	1	.3	8.3
Total	12	3.4	100.0

40f. Capacity of fodder storage (in kg)	Statistics
Valid	10
Missing	347
Mean	3510.0000
Median	3150.0000
Minimum	900.00
Maximum	9000.00
Sum	35100.00

40g. Capacity of fodder storage (in kg)	Frequency	Percent	Valid Percent
900.00	1	.3	10.0
1800.00	3	.8	30.0
2700.00	1	.3	10.0
3600.00	1	.3	10.0
4500.00	3	.8	30.0
9000.00	1	.3	10.0
Total	10	2.8	100.0

40h. Type of mixed storage	Frequency	Percent	Valid Percent
Wooden granary/storage	85	23.8	92.4
Wooden storage and iron sheets	2	.6	2.2
Concrete storage	1	.3	1.1
House storage	2	.6	2.2
Mud storage	2	.6	2.2
Total	92	25.8	100.0

40i. Capacity of mixed storage (in kg)	Statistics
Valid	87
Missing	270
Mean	3912.9885
Median	2700.0000
Minimum	50.00
Maximum	40500.00
Sum	340430.00

40j. Capacity of mixed storage (in kg)	Frequency	Percent	Valid Percent
50.00	1	.3	1.1
100.00	1	.3	1.1
180.00	1	.3	1.1
450.00	2	.6	2.3
900.00	2	.6	2.3
1350.00	2	.6	2.3
1800.00	21	5.9	24.1
2250.00	1	.3	1.1
2700.00	25	7.0	28.7
3150.00	1	.3	1.1
3500.00	1	.3	1.1
3600.00	5	1.4	5.7
4500.00	10	2.8	11.5
5400.00	1	.3	1.1
6300.00	1	.3	1.1
7200.00	1	.3	1.1
8100.00	1	.3	1.1
9000.00	8	2.2	9.2
18000.00	1	.3	1.1
40500.00	1	.3	1.1
Total	87	24.4	100.0

Q41

41a. Who decided to participate in the project?	Frequency	Percent	Valid Percent
Father	72	20.2	52.2
Mother	37	10.4	26.8
Father and mother	24	6.7	17.4
Son	2	.6	1.4
Daughter	1	.3	.7
Grandmother	2	.6	1.4
Total	138	38.7	100.0

41b. Why did you decide to participate (1) ? (grouped)	Frequency	Percent	Valid Percent
Access to loan	7	2.0	5.3
Better income	52	14.6	39.7
Better market/prices	15	4.2	11.5
Better milk prices	20	5.6	15.3
Ensured prices	1	.3	.8
Reliable pay	8	2.2	6.1
Gain knowledge	5	1.4	3.8
Improved animal health	2	.6	1.5
Improved breed/AI	3	.8	2.3
Other	18	5.0	13.7
Total	131	36.7	100.0

41c. Why did you decide to participate (2) ? (grouped)	Frequency	Percent	Valid Percent
Access to loan	2	.6	11.8
Better income	2	.6	11.8
Better market/prices	2	.6	11.8
Reliable pay	4	1.1	23.5
Improved animal health	4	1.1	23.5
Improved breed/AI	3	.8	17.6
Total	17	4.8	100.0

One household mentions as well 'Better income' and one 'Improves breed/AI' as a third reason.

Q42

42a. Initial investments made when joining the project	Frequency	Percent	Valid Percent
Yes	90	25.2	71.4
No	36	10.1	28.6
Total	126	35.3	100.0

42b. Initial investment (1)	Frequency	Percent	Valid Percent
Membership fee	61	17.1	67.8
Share	9	2.5	10.0
Registration fee	18	5.0	20.0
Purchase of animals	2	.6	2.2
Total	90	25.2	100.0

42c. Initial investment (2)	Frequency	Percent	Valid Percent
Membership fee	2	.6	15.4
Share	9	2.5	69.2
Purchase of animals	2	.6	15.4
Total	13	3.6	100.0

42d. Initial investment (3)	Frequency	Percent	Valid Percent
Purchase of equipment	1	.3	50.0
Purchase of land	1	.3	50.0
Total	2	.6	100.0

42e. Investments and costs	Initial investment (1)								Total	
	Membership fee		Share		Registration fee		Purchase of animals		Total	
	N	%	N	%	N	%	N	%	N	%
100.00	48	78.7	0	.0	15	83.3	0	.0	63	70.0
200.00	1	1.6	0	.0	0	.0	0	.0	1	1.1
500.00	3	4.9	0	.0	0	.0	0	.0	3	3.3
800.00	0	.0	0	.0	1	5.6	0	.0	1	1.1
1000.00	9	14.8	7	77.8	1	5.6	0	.0	17	18.9
1100.00	0	.0	2	22.2	1	5.6	0	.0	3	3.3
16000.00	0	.0	0	.0	0	.0	1	50.0	1	1.1
26000.00	0	.0	0	.0	0	.0	1	50.0	1	1.1
Total	61	100.0	9	100.0	18	100.0	2	100.0	90	100.0

42f. Investments and costs	Initial investment (2)						Total	
	Membership fee		Share		Purchase of animals		Total	
	N	%	N	%	N	%	N	%
100.00	2	100.0	0	.0	0	.0	2	18.2
500.00	0	.0	2	28.6	0	.0	2	18.2
1000.00	0	.0	2	28.6	0	.0	2	18.2
1100.00	0	.0	1	14.3	0	.0	1	9.1
2000.00	0	.0	1	14.3	0	.0	1	9.1
5000.00	0	.0	1	14.3	0	.0	1	9.1
18000.00	0	.0	0	.0	1	50.0	1	9.1
26000.00	0	.0	0	.0	1	50.0	1	9.1
Total	2	100.0	7	100.0	2	100.0	11	100.0

| 42g. Investments and costs | Initial investment (3) | | | | Total | |
| | Purchase of equipment | | Purchase of land | | | |
	N	%	N	%	N	%
20000.00	1	100.0	0	.0	1	50.0
150000.00	0	.0	1	100.0	1	50.0
Total	1	100.0	1	100.0	2	100.0

42h. Amount in KSH of all initial investments (inclusive of shares and fees)	Statistics
N Valid	91
N Missing	266
Mean	3480.2198
Median	100.0000
Minimum	100.00
Maximum	151100.00
Sum	316700.00

42i. Amount in KSH of all initial investments (inclusive of shares and fees)	Frequency	Percent	Valid Percent
100.00	56	15.7	61.5
200.00	1	.3	1.1
500.00	3	.8	3.3
600.00	1	.3	1.1
800.00	1	.3	1.1
1000.00	12	3.4	13.2
1100.00	4	1.1	4.4
1200.00	2	.6	2.2
1300.00	1	.3	1.1
2100.00	1	.3	1.1
5100.00	1	.3	1.1
6000.00	2	.6	2.2
16000.00	1	.3	1.1
22000.00	1	.3	1.1
25600.00	1	.3	1.1
27000.00	2	.6	2.2
151100.00	1	.3	1.1
Total	91	25.5	100.0

Q43

43a. Regular additional costs due to project participation	Frequency	Percent	Valid Percent
Yes	65	18.2	54.6
No	54	15.1	45.4
Total	119	33.3	100.0

43b. Amount in KSH for additional cost in labour	Frequency	Percent	Valid Percent
5000.00	1	.3	33.3
15000.00	1	.3	33.3
18000.00	1	.3	33.3
Total	3	.8	100.0

43c. Amount in KSH for additional cost in equipment	Frequency	Percent	Valid Percent
350.00	1	.3	16.7
600.00	1	.3	16.7
800.00	1	.3	16.7
1000.00	1	.3	16.7
2000.00	1	.3	16.7
2400.00	1	.3	16.7
Total	6	1.7	100.0

43d. Amount in KSH for additional cost in share expenditure	Frequency	Percent	Valid Percent
100.00	3	.8	33.3
1000.00	1	.3	11.1
1200.00	1	.3	11.1
3000.00	1	.3	11.1
5000.00	3	.8	33.3
Total	9	2.5	100.0

This question caused confusion as the project does not require regular membership or other fees. Therefore the given figures are perceived as initial investments and have been included in the calculation of the overall amount of initial investments (table 42ff).

43e. Amount in KSH for additional cost in resources (drugs, fodder)	Frequency	Percent	Valid Percent
4000.00	1	.3	14.3
5600.00	1	.3	14.3
12000.00	2	.6	28.6
13000.00	1	.3	14.3
15000.00	1	.3	14.3
24000.00	1	.3	14.3
Total	7	2.0	100.0

43f. Amount in KSH for additional cost in veterinary services	Frequency	Percent	Valid Percent
200.00	1	.3	7.7
1000.00	1	.3	7.7
1200.00	1	.3	7.7
1500.00	1	.3	7.7
1800.00	2	.6	15.4
2400.00	3	.8	23.1
5000.00	1	.3	7.7
6200.00	1	.3	7.7
8700.00	1	.3	7.7
15000.00	1	.3	7.7
Total	13	3.6	100.0

43g. Additional time per year (in h)	Statistics
N Valid	56
N Missing	301
Mean	180.0000
Median	143.0000
Minimum	1.00
Maximum	730.00
Sum	10080.00

43h. Additional time per year (in h)	Freque ncy	Percent	Valid Percent
1.00	17	4.8	30.4
2.00	3	.8	5.4
3.00	1	.3	1.8
12.00	1	.3	1.8
24.00	1	.3	1.8
60.00	1	.3	1.8
64.00	1	.3	1.8
91.00	1	.3	1.8
120.00	1	.3	1.8
136.00	1	.3	1.8
150.00	1	.3	1.8
180.00	2	.6	3.6
182.00	1	.3	1.8
205.00	1	.3	1.8
315.00	1	.3	1.8
340.00	1	.3	1.8
350.00	1	.3	1.8
360.00	4	1.1	7.1
365.00	15	4.2	26.8
730.00	1	.3	1.8
Total	56	15.7	100.0

CORRECTED

43i. Additional time per year (in h) – corrected	Statistics
N Valid	56
N Missing	301
Mean	349.0000
Median	365.0000
Minimum	12.00
Maximum	1095.00
Sum	19544.00

43j. Additional time per year (in h) - corrected	Frequency	Percent	Valid Percent
12.00	1	.3	1.8
24.00	1	.3	1.8
60.00	1	.3	1.8
64.00	1	.3	1.8
91.00	1	.3	1.8
120.00	1	.3	1.8
136.00	1	.3	1.8
150.00	1	.3	1.8
180.00	2	.6	3.6
182.00	1	.3	1.8
205.00	1	.3	1.8
315.00	1	.3	1.8
340.00	1	.3	1.8
350.00	1	.3	1.8
360.00	4	1.1	7.1
365.00	32	9.0	57.1
730.00	4	1.1	7.1
1095.00	1	.3	1.8
Total	56	15.7	100.0

43k. Amount in KSH of all additional costs (exclusive of shares, fees and time)	Statistics
N Valid	21
N Missing	336
Mean	8588.0952
Median	5000.0000
Minimum	350.00
Maximum	39700.00
Sum	180350.00

43l. Amount in KSH of all additional costs (exclusive of shares, fees and time)	Frequency	Percent	Valid Percent
350.00	1	.3	4.8
600.00	1	.3	4.8
800.00	1	.3	4.8
1000.00	1	.3	4.8
1800.00	2	.6	9.5
2000.00	1	.3	4.8
2400.00	3	.8	14.3
5000.00	1	.3	4.8
5500.00	1	.3	4.8
6200.00	1	.3	4.8
6800.00	1	.3	4.8
13000.00	1	.3	4.8
14400.00	1	.3	4.8
15000.00	2	.6	9.5
20000.00	1	.3	4.8
24200.00	1	.3	4.8
39700.00	1	.3	4.8
Total	21	5.9	100.0

Q44

44a. Benefits or Disadvantages from joining the project	Frequency	Percent	Valid Percent
More benefits	114	31.9	89.1
More disadvantages	5	1.4	3.9
Evenly balanced	9	2.5	7.0
Total	128	35.9	100.0

44b. First main benefit accrued (grouped)	Frequency	Percent	Valid Percent
Access to AI	5	1.4	4.1
Access to loan	45	12.6	37.2
Transport of milk	6	1.7	5.0
Improved income	29	8.1	24.0
Good market for milk	4	1.1	3.3
Good market for other products	1	.3	.8
Improved animal health	2	.6	1.7
Reliable payment	19	5.3	15.7
Training/gain knowledge	5	1.4	4.1
Proximity to plant	3	.8	2.5
Other	2	.6	1.7
Total	121	33.9	100.0

44c. Second main benefit accrued (grouped)	Frequency	Percent	Valid Percent
Access to AI	4	1.1	14.3
Access to loan	7	2.0	25.0
Transport of milk	2	.6	7.1
Improved income	5	1.4	17.9
Good market for milk	1	.3	3.6
Good market for other products	1	.3	3.6
Reliable payment	2	.6	7.1
Training/gain knowledge	5	1.4	17.9
Other	1	.3	3.6
Total	28	7.8	100.0

44d. Main disadvantages experienced (1)	Frequency	Percent	Valid Percent
None	347	97.2	97.2
Delayed payments	1	.3	.3
Fluctuation in milk prices	1	.3	.3
Less pay than expected	2	.6	.6
Long distance from the farm	1	.3	.3
Milk rejection	2	.6	.6
More expensive	1	.3	.3
Sacco charges	1	.3	.3
Self transport of milk to chilling plant	1	.3	.3
Total	357	100.0	100.0

One other household mentions the Sacco charges as a disadvantage as well.

Q45

45a. Observed increase in income	Frequency	Percent	Valid Percent
Yes	82	23.0	75.9
No	26	7.3	24.1
Total	108	30.3	100.0

45b. First type of additional income / business	Frequency	Percent	Valid Percent
Healthier animals	12	3.4	15.2
Additional milk	65	18.2	82.3
Higher price per liter milk	1	.3	1.3
Selling clothes	1	.3	1.3
Total	79	22.1	100.0

45c. Additional income in KSH in last 12 months	Statistics
N Valid	75
N Missing	282
Mean	7243.0667
Median	3560.0000
Minimum	1000.00
Maximum	36000.00
Sum	543230.00

45d. Additional income in KSH in last 12 months	Frequency	Percent	Valid Percent
Up to 1500	11	3.1	14.7
1501 to 2000	12	3.4	16.0
2001 to 3000	13	3.6	17.3
3001 to 4000	10	2.8	13.3
4001 to 8000	10	2.8	13.3
8001 to 12000	5	1.4	6.7
More than 12000	14	3.9	18.7
Total	75	21.0	100.0

| 45e. Additional income in KSH in last 12 months for type 1 | 45.2 First type of additional income / business | | | | | | | | Total | |
| | Healthier animals | | Additional milk | | Higher price per litre milk | | Selling clothes | | | |
	N	%	N	%	N	%	N	%	N	%
Up to 1500	4	33.3	7	11.5	0	.0	0	.0	11	14.7
1501 to 2000	1	8.3	11	18.0	0	.0	0	.0	12	16.0
2001 to 3000	2	16.7	11	18.0	0	.0	0	.0	13	17.3
3001 to 4000	2	16.7	8	13.1	0	.0	0	.0	10	13.3
4001 to 8000	0	.0	9	14.8	1	100.0	0	.0	10	13.3
8001 to 12000	2	16.7	3	4.9	0	.0	0	.0	5	6.7
More than 12000	1	8.3	12	19.7	0	.0	1	100.0	14	18.7
Total	12	100.0	61	100.0	1	100.0	1	100.0	75	100.0

Q46

46a. Who decided not to join the project?	Frequency	Percent	Valid Percent
Father	103	28.9	50.0
Mother	68	19.0	33.0
Father and Mother	20	5.6	9.7
No body	15	4.2	7.3
Total	206	57.7	100.0

46b. Reason for not joining	Frequency	Percent	Valid Percent
Other markets	12	3.4	6.5
Distance to plant	12	3.4	6.5
Late/delayed payment	6	1.7	3.2
Not enough milk	75	21.0	40.3
Lack of knowledge/training	44	12.3	23.7
Lack of finances	3	.8	1.6
Personal reasons	6	1.7	3.2
Project might fail	6	1.7	3.2
No need/see no benefit	1	.3	.5
No cows	16	4.5	8.6
Project costs	3	.8	1.6
Other	2	.6	1.1
Total	186	52.1	100.0

Q47

47. Requirements to join the project	1. More training		2. Lower costs of initial investment		3. Less money for membership		4. More labour force		5. More equipment		6. See good examples		7. More immediate benefits / revenue		8. More assistance from a project	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	169	79.0	93	43.5	56	26.2	50	23.4	60	28.2	105	49.1	103	48.1	78	36.4
No	45	21.0	121	56.5	158	73.8	164	76.6	153	71.8	109	50.9	111	51.9	136	63.6
Total	214	100.0	214	100.0	214	100.0	214	100.0	213	100.0	214	100.0	214	100.0	214	100.0

Q48

48a. Amount willing to invest in KSH (grouped)	Statistics
N Valid	160
N Missing	197
Mean	13860.0000
Median	4000.0000
Minimum	200.00
Maximum	200000.00
Sum	2217600.00

48b. Amount willing to invest in KSH (grouped)	Frequency	Percent	Valid Percent
Up to 1000	16	4.5	10.0
1001 to 1500	18	5.0	11.3
1501 to 2000	28	7.8	17.5
2001 to 4000	19	5.3	11.9
4001 to 6000	12	3.4	7.5
6001 to 8000	6	1.7	3.8
8001 to 16000	27	7.6	16.9
16000 to 32000	22	6.2	13.8
More than 32000	12	3.4	7.5
Total	160	44.8	100.0

Q49

49a. Knowledge about the term 'Climate Change'	Frequency	Percent	Valid Percent
Yes	308	86.3	87.5
No	44	12.3	12.5
Total	352	98.6	100.0

49b. First explanation of 'Climate Change' (grouped)	Frequency	Percent	Valid Percent
Changes in weather	139	38.9	45.3
Colder temperature	7	2.0	2.3
Changes of seasons	6	1.7	2.0
Alterations in one season	10	2.8	3.3
Unpredictable weather	4	1.1	1.3
Change in rain patterns	21	5.9	6.8
Prolonged rainfall	6	1.7	2.0
Unpredictable/erratic rainfall	52	14.6	16.9
Increased rainfall	34	9.5	11.1
Prolonged dry season	21	5.9	6.8
Less rain	2	.6	.7
Changes in planting	2	.6	.7
Global warming	1	.3	.3
Warmer temperatures	1	.3	.3
Other	1	.3	.3
Total	307	86.0	100.0

49c. Second explanation of 'Climate Change' (grouped)	Frequency	Percent	Valid Percent
Colder temperature	1	.3	5.3
Changes of seasons	1	.3	5.3
Change in rain patterns	2	.6	10.5
Prolonged rainfall	2	.6	10.5
Unpredictable/erratic rainfall	1	.3	5.3
Increased rainfall	4	1.1	21.1
Prolonged dry season	6	1.7	31.6
Global warming	1	.3	5.3
Warmer temperatures	1	.3	5.3
Total	19	5.3	100.0

49d. All explanations of 'Climate Change' (grouped)	Frequency	Percent
Changes in weather	139	42.6
Colder temperature	8	2.5
Changes of seasons	7	2.1
Alterations in one season	10	3.1
Unpredictable weather	4	1.2
Change in rain patterns	23	7.1
Prolonged rainfall	8	2.5
Unpredictable/erratic rainfall	53	16.3
Increased rainfall	38	11.7
Prolonged dry season	27	8.3
Less rain	2	.6
Changes in planting	2	.6
Global warming	2	.6
Warmer temperatures	2	.6
Other	1	.3
Total	307	94.2

49e. First possible meaning of 'Climate Change'	Frequency	Percent	Valid Percent
Change in weather	7	2.0	38.9
Increased rainfall	4	1.1	22.2
Increase and decrease in rainfall	2	.6	11.1
Unpredictable rain	2	.6	11.1
Alterations in one season	1	.3	5.6
More sunny days	1	.3	5.6
Decrease in rainfall	1	.3	5.6
Total	18	5.0	100.0

Q50

50a. Most striking change in climate	Frequency	Percent	Valid Percent
Nothing	40	11.2	11.3
More rainfall	219	61.3	61.9
Less rainfall	24	6.7	6.8
More floods	2	.6	.6
Dry season much longer	52	14.6	14.7
More rainfall and less rainfall	3	.8	.8
Unpredictable Climate	2	.6	.6
Don't know	12	3.4	3.4
Total	354	99.2	100.0

50b. First impact of climate change on family (grouped)	Frequency	Percent	Valid Percent
Destruction of crops/low yields	32	9.0	11.3
Delayed/unpredictable planting	2	.6	.7
Increase in diseases	77	21.6	27.2
Shortage of food	37	10.4	13.1
Increase in hh expenditures	61	17.1	21.6
Increase in labour	1	.3	.4
Increase in inputs (fertilizer, chemicals...)	2	.6	.7
Plant more	1	.3	.4
Lack of water	4	1.1	1.4
Reduced production/lower income	41	11.5	14.5
Soil erosion	2	.6	.7
More wood/charcoal required	3	.8	1.1
Reduced milk production	1	.3	.4
Other	10	2.8	3.5
Nothing	9	2.5	3.2
Total	283	79.3	100.0

50c. Second impact of climate change on family (grouped)	Frequency	Percent	Valid Percent
Destruction of crops/low yields	3	.8	8.6
Delayed/unpredictable planting	3	.8	8.6
Increase in diseases	8	2.2	22.9
Shortage of food	2	.6	5.7
Increase in hh expenditures	11	3.1	31.4
Reduced production/lower income	4	1.1	11.4
More wood/charcoal required	1	.3	2.9
Other	3	.8	8.6
Total	35	9.8	100.0

50d. All impact of climate change on family (grouped)	Frequency	Percent
Destruction of crops/low yields	35	11.0
Delayed/unpredictable planting	5	1.6
Increase in diseases	85	26.7
Shortage of food	39	12.3
Increase in hh expenditures	72	22.6
Increase in labour	1	.3
Increase in inputs (fertilizer, chemicals...)	2	.6
Plant more	1	.3
Lack of water	4	1.3
Reduced production/lower income	45	14.2
Soil erosion	2	.6
More wood/charcoal required	4	1.3
Reduced milk production	1	.3
Other	13	4.1
Nothing	9	2.8
Total	318	100.0

50e1. First impact of climate change on family (grouped)	PROJECT PARTICIPANTS		NON-PARTICIPANTS	
	Frequency	Valid Percent	Frequency	Valid Percent
Destruction of crops/low yields	8	7.2	24	14.0
Delayed/unpredictable planting	1	.9	1	.6
Increase in diseases	35	31.5	42	24.4
Shortage of food	12	10.8	25	14.5
Increase in hh expenditures	26	23.4	35	20.3
Increase in inputs (fertilizer, chemicals...)	1	.9	1	.6
Lack of water	2	1.8	1	.6
Reduced production/lower income	16	14.4	1	.6
Soil erosion	2	1.8	2	1.2
Reduced milk production	1	.9	25	14.5
More wood/charcoal required			3	1.7
Other	2	1.8	8	4.7
Nothing	5	4.5	4	2.3
Total	111	100.0	172	100.0

50e2. Second impact of climate change on family (grouped)	PROJECT PARTICIPANTS		NON-PARTICIPANTS	
	Frequency	Valid Percent	Frequency	Valid Percent
Destruction of crops/low yields			3	13.6
Delayed/unpredictable planting	1	7.7	2	9.1
Increase in diseases	2	15.4	6	27.3
Shortage of food	1	7.7	1	4.5
Increase in hh expenditures	4	30.8	7	31.8
Reduced production/lower income	3	23.1	1	4.5
More wood/charcoal required			1	4.5
Other	2	15.4	1	4.5
Total	13	100.0	22	100.0

50f1. First impact of climate change on family (grouped)	WOMEN HEADED HOUSEHOLD		
	Frequency	Percent	Valid Percent
Destruction of crops/low yields	5	8.5	11.1
Increase in diseases	13	22.0	28.9
Shortage of food	3	5.1	6.7
Increase in hh expenditures	11	18.6	24.4
Increase in labour	1	1.7	2.2
Reduced production/lower income	9	15.3	20.0
Soil erosion	1	1.7	2.2
Nothing	2	3.4	4.4
Total	45	76.3	100.0

50f2. Second impact of climate change on family (grouped)	WOMEN HEADED HOUSEHOLD		
	Frequency	Percent	Valid Percent
Reduced production/lower income	1	1.7	33.3
Other	2	3.4	66.7
Total	3	5.1	100.0

50g. First impact of climate change on livestock/agriculture (grouped)	Frequency	Percent	Valid Percent
Livestock diseases	8	2.2	2.7
Diseases	10	2.8	3.4
Death of livestock	50	14.0	17.0
Destruction of crops	30	8.4	10.2
Reduced production/yield	93	26.1	31.6
Increased production/yield	9	2.5	3.1
Destruction of structures	1	.3	.3
Decreased milk production	40	11.2	13.6
Improved milk production	7	2.0	2.4
Lack of water	5	1.4	1.7
Lack of / expensive implements	2	.6	.7
Erosion	17	4.8	5.8
More feed	4	1.1	1.4
Less feed	5	1.4	1.7
Other	2	.6	.7
No changes	11	3.1	3.7
Total	294	82.4	100.0

50h. Second impact of climate change on livestock/agriculture (grouped)	Frequency	Percent	Valid Percent
Livestock diseases	1	.3	1.6
Diseases	5	1.4	7.9
Death of livestock	3	.8	4.8
Destruction of crops	13	3.6	20.6
Reduced production/yield	15	4.2	23.8
Decreased milk production	5	1.4	7.9
Improved milk production	1	.3	1.6
Lack of water	2	.6	3.2
Lack of / expensive implements	4	1.1	6.3
Erosion	9	2.5	14.3
More feed	1	.3	1.6
Less feed	2	.6	3.2
Other	2	.6	3.2
Total	63	17.6	100.0

50i. All impact of climate change on livestock/agriculture (grouped)	Frequency	Percent
Livestock diseases	9	2.5
Diseases	15	4.2
Death of livestock	53	14.8
Destruction of crops	43	12.0
Reduced production/yield	108	30.3
Increased production/yield	9	2.5
Destruction of structures	1	.3
Decreased milk production	45	12.6
Improved milk production	8	2.2
Lack of water	7	2.0
Lack of / expensive implements	6	1.7
Erosion	26	7.3
More feed	5	1.4
Less feed	7	2.0
Other	4	1.1
No changes	11	3.1
Total	357	100.0

50j1. First impact of climate change on livestock/agriculture (grouped)	PROJECT PARTICIPANTS		NON-PARTICIPANTS	
	Frequency	Valid Percent	Frequency	Valid Percent
Livestock diseases	3	2.5	5	2.9
Diseases	5	4.2	5	2.9
Death of livestock	18	15.1	32	18.3
Destruction of crops	11	9.2	19	10.9
Reduced production/yield	37	31.1	56	32.0
Increased production/yield	4	3.4	5	2.9
Destruction of structures	1	.8		
Decreased milk production	21	17.6	19	10.9
Improved milk production	4	3.4	3	1.7
Lack of water	1	.8	4	2.3
Lack of / expensive implements	1	.8	1	.6
Erosion	6	5.0	11	6.3
More feed			4	2.3
Less feed	3	2.5	2	1.1
Other			2	1.1
No changes	4	3.4	7	4.0
Total	119	100.0	175	100.0

50j2. Second impact of climate change on livestock/agriculture (grouped)	PROJECT PARTICIPANTS		NON-PARTICIPANTS	
	Frequency	Valid Percent	Frequency	Valid Percent
Livestock diseases	1	3.0	0	.0
Diseases	2	6.1	3	10.0
Death of livestock	1	3.0	2	6.7
Destruction of crops	5	15.2	8	26.7
Reduced production/yield	10	30.3	5	16.7
Decreased milk production	5	15.2	0	.0
Improved milk production	1	3.0	0	.0
Lack of water	0	.0	2	6.7
Lack of / expensive implements	3	9.1	1	3.3
Erosion	3	9.1	0	.0
More feed			1	3.3
Less feed	1	3.0	1	3.3
Other	1	3.0	1	3.3
Total	33	100.0	30	100.0

50k1. First impact of climate change on livestock/agriculture (grouped)	WOMEN HEADED HOUSEHOLD		
	Frequency	Percent	Valid Percent
Livestock diseases	1	1.7	2.2
Death of livestock	8	13.6	17.4
Destruction of crops	5	8.5	10.9
Reduced production/yield	19	32.2	41.3
Decreased milk production	9	15.3	19.6
Lack of water	1	1.7	2.2
Erosion	1	1.7	2.2
No changes	2	3.4	4.3
Total	46	78.0	100.0

50k2. Second impact of climate change on livestock/agriculture (grouped)	WOMEN HEADED HOUSEHOLD		
	Frequency	Percent	Valid Percent
Diseases	1	1.7	9.1
Death of livestock	1	1.7	9.1
Destruction of crops	3	5.1	27.3
Decreased milk production	1	1.7	9.1
Erosion	3	5.1	27.3
More feed	1	1.7	9.1
Less feed	1	1.7	9.1
Total	11	18.6	100.0

50l. First change made regarding agriculture and livestock (grouped)	Frequency	Percent	Valid Percent
New breed	2	.6	1.1
Reduce herd	21	5.9	11.5
Improve animal health	3	.8	1.6
Give more feeds	2	.6	1.1
Give improved feeds	3	.8	1.6
Give supplements	1	.3	.5
Grow feeds	11	3.1	6.0
Build sheds	14	3.9	7.7
Fodder storage	7	2.0	3.8
Use/store crop residue	1	.3	.5
Improve water supply	5	1.4	2.7
Zero grazing	1	.3	.5
Less feeds	1	.3	.5
Change type of crop	10	2.8	5.5
Mix crops	3	.8	1.6
Build terraces	18	5.0	9.8
Change planting practices	11	3.1	6.0
Reduce planting area	1	.3	.5
Plant trees	3	.8	1.6
Use implements	2	.6	1.1
Use additional land	3	.8	1.6
No changes	46	12.9	25.1
Other	14	3.9	7.7
Total	183	51.3	100.0

50m. Second change made regarding agriculture and livestock (grouped)	Frequency	Percent	Valid Percent
Give more feeds	1	.3	4.2
Fodder storage	2	.6	8.3
Change type of crop	7	2.0	29.2
Mix crops	1	.3	4.2
Build terraces	4	1.1	16.7
Change planting practices	3	.8	12.5
Reduce planting area	1	.3	4.2
Use implements	4	1.1	16.7
Other	1	.3	4.2
Total	24	6.7	100.0

50n. All changes made regarding agriculture and livestock (grouped)	Frequency	Percent
New breed	2	1.0
Reduce herd	21	10.1
Improve animal health	3	1.4
Give more feeds	3	1.4
Give improved feeds	3	1.4
Give supplements	1	.5
Grow feeds	11	5.3
Build sheds	14	6.8
Fodder storage	9	4.3
Use/store crop residue	1	.5
Improve water supply	5	2.4
Zero grazing	1	.5
Less feeds	1	.5
Change type of crop	17	8.2
Mix crops	4	1.9
Build terraces	22	10.6
Change planting practices	14	6.8
Reduce planting area	2	1.0
Plant trees	3	1.4
Use implements	6	2.9
Use additional land	3	1.4
No changes	46	22.2
Other	15	7.2
Total	207	100.0

50o. First preparation being done/planned (grouped)	Frequency	Percent	Valid Percent
Build sheds	52	14.6	20.5
Increase herd	1	.3	.4
Get borehole/alternative water resource	8	2.2	3.1
Build water storage/tank	14	3.9	5.5
Build/use food/fodder storage	15	4.2	5.9
Grow Napier	6	1.7	2.4
Grow fodder	2	.6	.8
Grow food	1	.3	.4
Grow trees	13	3.6	5.1
Grow other crops	10	2.8	3.9
Build terraces	22	6.2	8.7
Timely planting/harvesting	40	11.2	15.7
Irrigation	6	1.7	2.4
Get protective gear	17	4.8	6.7
Save money	1	.3	.4
Zero grazing	1	.3	.4
Climate Smart Agriculture practices	2	.6	.8
Nothing	42	11.8	16.5
Other	1	.3	.4
Total	254	71.1	100.0

50p. Second preparation being done/planned (grouped)	Frequency	Percent	Valid Percent
Build sheds	5	1.4	13.2
Increase herd	1	.3	2.6
Build/use food/fodder storage	3	.8	7.9
Grow Napier	1	.3	2.6
Grow trees	2	.6	5.3
Grow other crops	7	2.0	18.4
Build terraces	5	1.4	13.2
Timely planting/harvesting	8	2.2	21.1
Get protective gear	2	.6	5.3
Save money	1	.3	2.6
Other	3	.8	7.9
Total	38	10.6	100.0

Grow other crops: cover crops, drought resistant, shorter growing time
Other: Lightning arrester (mainly mention for second answer)
Timely planting/harvesting: timely seeding, weeding and earlier/or in-time harvesting

50q. All preparations being done/planned (grouped)	Frequency	Percent
Build sheds	57	19.5
Increase herd	2	.7
Get borehole	8	2.7
Build water storage/tank	14	4.8
Build/use food/fodder storage	18	6.2
Grow Napier	7	2.4
Grow fodder	2	.7
Grow food	1	.3
Grow trees	15	5.1
Grow other crops	17	5.8
Build terraces	27	9.2
Timely planting/harvesting	48	16.4
Irrigation	6	2.1
Get protective gear	19	6.5
Save money	2	.7
Zero grazing	1	.3
Climate Smart Agriculture practices	2	.7
Nothing	42	14.4
Other	4	1.4
Total	292	100.0

Q51

51a. First source of revenue for first economically active hh member	Frequency	Percent	Valid Percent
Gov employment	35	9.8	9.9
Private employment	17	4.8	4.8
Paid labour in private agriculture	2	.6	.6
Occasional jobs	1	.3	.3
Own agriculture	272	76.2	77.1
Own livestock breeding, animal products	7	2.0	2.0
Self employed	7	2.0	2.0
Pensioner	12	3.4	3.4
Total	353	98.9	100.0

4 households either have no source of income or refused to answer!

51b. Second source of revenue for first economically active hh member	Frequency	Percent	Valid Percent
Gov employment	2	.6	.7
Occasional jobs	3	.8	1.0
Own agriculture	71	19.9	23.4
Own livestock breeding, animal products	223	62.5	73.6
Self employed	4	1.1	1.3
Total	303	84.9	100.0

51c. Third source of revenue for first economically active hh member	Frequency	Percent	Valid Percent
Gov employment	11	3.1	10.2
Private employment	3	.8	2.8
Seasonal worker	4	1.1	3.7
Occasional jobs	5	1.4	4.6
Own agriculture	2	.6	1.9
Own livestock breeding, animal products	66	18.5	61.1
Self employed	16	4.5	14.8
Pensioner	1	.3	.9
Total	108	30.3	100.0

51d. First source of revenue for second economically active hh member	Frequency	Percent	Valid Percent
Gov employment	11	3.1	3.8
Private employment	6	1.7	2.0
Paid labour in private agriculture	1	.3	.3
Own agriculture	257	72.0	87.7
Own livestock breeding, animal products	6	1.7	2.0
Self employed	4	1.1	1.4
Gov assistance	1	.3	.3
Pensioner	2	.6	.7
Housewife	5	1.4	1.7
Total	293	82.1	100.0

51e. Second source of revenue for second economically active hh member	Frequency	Percent	Valid Percent
Occasional jobs	2	.6	.8
Own agriculture	23	6.4	9.7
Own livestock breeding, animal products	210	58.8	88.6
Self employed	2	.6	.8
Total	237	66.4	100.0

51f. Third source of revenue for second economically active hh member	Frequency	Percent	Valid Percent
Gov employment	1	.3	3.0
Private employment	1	.3	3.0
Occasional jobs	2	.6	6.1
Own agriculture	1	.3	3.0
Own livestock breeding, animal products	19	5.3	57.6
Self employed	8	2.2	24.2
Pensioner	1	.3	3.0
Total	33	9.2	100.0

51g. First source of revenue for third economically active hh member	Frequency	Percent	Valid Percent
Gov employment	5	1.4	8.2
Private employment	6	1.7	9.8
paid labor in gov agriculture	1	.3	1.6
Seasonal worker	1	.3	1.6
Own agriculture	43	12.0	70.5
Own livestock breeding, animal products	1	.3	1.6
Self employed	1	.3	1.6
Not economically active	3	.8	4.9
Total	61	17.1	100.0

51h. Second source of revenue for third economically active hh member	Frequency	Percent	Valid Percent
Own agriculture	3	.8	7.1
Own livestock breeding, animal products	39	10.9	92.9
Total	42	11.8	100.0

51i. Third source of revenue for third economically active hh member	Frequency	Percent	Valid Percent
Occasional jobs	1	.3	16.7
Own livestock breeding, animal products	2	.6	33.3
Self employed	3	.8	50.0
Total	6	1.7	100.0

51j. First source of revenue for forth economically active hh member	Frequency	Percent	Valid Percent
Gov employment	2	.6	8.7
Private employment	3	.8	13.0
Own agriculture	17	4.8	73.9
Not economically active	1	.3	4.3
Total	23	6.4	100.0

51k. Second source of revenue for forth economically active hh member	Frequency	Percent	Valid Percent
Own livestock breeding, animal products	14	3.9	87.5
Self employed	2	.6	12.5
Total	16	4.5	100.0

51l. Third source of revenue for forth economically active hh member	Frequency	Percent	Valid Percent
Self employed	2	.6	100.0
Total	2	.6	100.0

51m. First source of revenue for fifth economically active hh member	Frequency	Percent	Valid Percent
Paid labour in private agriculture	1	.3	10.0
Own agriculture	8	2.2	80.0
Own livestock breeding, animal products	1	.3	10.0
Total	10	2.8	100.0

51n. Second source of revenue for fifth economically active hh member	Frequency	Percent	Valid Percent
Own livestock breeding, animal products	7	2.0	87.5
Self employed	1	.3	12.5
Total	8	2.2	100.0

51o. Third source of revenue for fifth economically active hh member	Frequency	Percent	Valid Percent
Self employed	1	.3	100.0
Total	1	.3	100.0

51p. All sources of revenue from all hh members	Frequency	Percent
Gov employment	67	4.5
Private employment	36	2.4
paid labor in gov agriculture	1	.1
Paid labour in private agriculture	4	.3
Seasonal worker	5	.3
Occasional jobs	14	.9
Own agriculture	697	46.6
Own livestock breeding, animal products	595	39.8
Self employed	51	3.4
Gov assistance	1	.1
Pensioner	16	1.1
Housewife	5	.3
Not economically active	4	.3
Total	1496	100.0

51q. All household income for all hh members in KSH	Statistics
Valid	345
Missing	12
Mean	343373.9246
Median	115800.0000
Minimum	1500.00
Maximum	20062200.00
Sum	118464004.00

51r. All household income for all hh members in KSH	Frequency	Percent	Valid Percent
Up to 25000	46	12.9	13.3
25001 to 50000	38	10.6	11.0
50001 to 100000	63	17.6	18.3
100001 to 200000	92	25.8	26.7
200001 to 400000	61	17.1	17.7
400001 to 600000	17	4.8	4.9
More than 600000	28	7.8	8.1
Total	345	96.6	100.0

51s. All household income divided by hh members in KSH (grouped)	Statistics
Valid	345
Missing	12
Mean	104502.3590
Median	25100.0000
Minimum	300.00
Maximum	10031100.00
Sum	36053313.85

51t. All household income divided by hh members in KSH (grouped)	Frequency	Percent	Valid Percent
Up to 5000	44	12.3	12.8
5001 to 10000	36	10.1	10.4
10001 to 20000	67	18.8	19.4
20001 to 30000	48	13.4	13.9
30001 to 40000	34	9.5	9.9
40001 to 50000	26	7.3	7.5
50001 to 100000	50	14.0	14.5
100001 to 200000	17	4.8	4.9
More than 200000	23	6.4	6.7
Total	345	96.6	100.0

51u. All sources of revenue from all hh members	All household income for all hh members in KSH (grouped)															Total	
	Up to 25000		25001 to 50000		50001 to 100000		100001 to 200000		200001 to 400000		400001 to 600000		More than 60000				
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Gov employment	0	0	3	1.9	7	2.8	13	3.4	23	8.2	8	8.9	10	7.2	64	4.4
Private employment	0	0	3	1.9	4	1.6	9	2.3	8	2.9	4	4.4	5	3.6	33	2.3
paid labor in gov agriculture	0	0	0	0	0	0	0	0	0	0	1	1.1	0	0	1	0.1
Paid labour in private agriculture	0	0	0	0	0	0	3	0.8	1	0.4	0	0	0	0	4	0.3
Seasonal worker	1	0.7	4	2.5	0	0	0	0	0	0	0	0	0	0	5	0.3
Occasional jobs	2	1.5	2	1.3	2	0.8	7	1.8	1	0.4	0	0	0	0	14	1
Own agriculture	84	61.3	71	44.7	121	48	176	45.5	122	43.7	34	37.8	56	40.6	664	46.1
Own livestock breeding, animal products	44	32.1	66	41.5	102	40.5	165	42.6	114	40.9	36	40	54	39.1	581	40.3
Self employed	6	4.4	9	5.7	16	6.3	10	2.6	5	1.8	4	4.4	1	0.7	51	3.5
Gov assistance	0	0	0	0	0	0	0	0	1	0.4	0	0	0	0	1	0.1
Pensioner	0	0	0	0	0	0	2	0.5	2	0.7	3	3.3	9	6.5	16	1.1
Housewife	0	0	0	0	0	0	1	0.3	2	0.7	0	0	2	1.4	5	0.3
Not economically active	0	0	1	0.6	0	0	1	0.3	0	0	0	0	1	0.7	3	0.2
Total	137	100	159	100.1	252	100	387	100.1	279	100.1	90	99.9	138	99.8	1442	100

Q52

52a. Main bread winner	Frequency	Percent	Valid Percent
Man	265	74.2	86.6
Woman	41	11.5	13.4
Total	306	85.7	100.0

52b. Second main bread winner	Frequency	Percent	Valid Percent
Man	4	1.1	2.8
Woman	139	38.9	97.2
Total	143	40.1	100.0

52c. Third main bread winner	Frequency	Percent	Valid Percent
Man	1	.3	33.3
Woman	2	.6	66.7
Total	3	.8	100.0

The third bread winner was most often a daughter or a son from an elderly couple.

Note: Due to a numbering mistake in the questionnaire, there is no question nr. 53.

Q54

54a. Additional sources of income	Frequency	Percent	Valid Percent
Yes	76	21.3	21.5
No	277	77.6	78.5
Total	353	98.9	100.0

54b. First type of additional (external) sources of income	Frequency	Percent	Valid Percent
Transfer from relatives abroad	5	1.4	6.7
Transfer from relatives in Kenya	27	7.6	36.0
Saving clubs/microfinance	19	5.3	25.3
Credit from bank/friend/project	21	5.9	28.0
Food and animals	1	.3	1.3
Cattle selling	2	.6	2.7
Total	75	21.0	100.0

54c. Second type of additional (external) sources of income	Frequency	Percent	Valid Percent
Transfer from relatives in Kenya	1	.3	14.3
Gifts	1	.3	14.3
Saving clubs/microfinance	2	.6	28.6
Credit from bank/friend/project	3	.8	42.9
Total	7	2.0	100.0

54d. Third type of additional (external) sources of income	Frequency	Percent	Valid Percent
Gifts	1	.3	100.0
System	356	99.7	100.0

54e. Amount of all annual additional external income in KSH	Statistics
Valid	357
Missing	0
Mean	8131.0924
Median	.0000
Minimum	.00
Maximum	300000.00
Sum	2902800.00

54f. Amount of all annual additional external income in KSH	Frequency	Percent	Valid Percent
Up to 5000	5	1.4	8.5
5001 to 10000	8	2.2	13.6
10001 to 20000	18	5.0	30.5
20001 to 40000	9	2.5	15.3
40001 to 100000	12	3.4	20.3
100001 to 150000	3	.8	5.1
More than 150000	4	1.1	6.8
Total	59	16.5	100.0

54g. Amount of all annual additional external income in KSH by type	Type of additional external income														Total	
	Transfer from relatives abroad		Transfer from relatives in Kenya		Gifts		Saving clubs/microfinance		Credit from bank/friend/project		Food and animals		Cattle selling		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Up to 5000	0	.0	3	13.0	0	.0	2	10.5	0	.0	0	.0	0	.0	5	8.5
5001 to 10000	1	100.0	6	26.1	0	.0	0	.0	0	.0	0	.0	1	50.0	8	13.6
10001 to 20000	0	.0	10	43.5	0	.0	6	31.6	3	16.7	0	.0	1	50.0	18	30.5
20001 to 40000	0	.0	2	8.7	1	100.0	2	10.5	5	27.8	1	100.0	0	.0	9	15.3
40001 to 100000	0	.0	1	4.3	0	.0	6	31.6	6	33.3	0	.0	0	.0	12	20.3
100001 to 150000	0	.0	1	4.3	0	.0	1	5.3	1	5.6	0	.0	0	.0	3	5.1
More than 150000	0	.0	0	.0	0	.0	2	10.5	3	16.7	0	.0	0	.0	4	6.8
Total	1	100.0	23	100.0	1	100.0	19	100.0	18	100.0	1	100.0	2	100.0	59	100.0

54h. All household income from revenue and external sources in KSH	Statistics
Valid	348
Missing	9
Mean	348755.1839
Median	119150.0000
Minimum	1500.00
Maximum	20212200.00
Sum	121366804.00

54i. All household income from revenue and external sources in KSH (grouped)	Frequency	Percent	Valid Percent
Up to 25000	48	13.4	13.8
25001 to 50000	39	10.9	11.2
50001 to 100000	60	16.8	17.2
100001 to 200000	89	24.9	25.6
200001 to 400000	63	17.6	18.1
400001 to 600000	19	5.3	5.5
More than 60000	30	8.4	8.6
Total	348	97.5	100.0

54j. All household income from revenue and external sources in KSH divided by hh members (grouped)	Statistics
Valid	348
Missing	9
Mean	105233.7038
Median	25845.2381
Minimum	300.00
Maximum	10106100.00
Sum	36621328.92

54k. All household income from revenue and external sources in KSH divided by hh members (grouped)	Frequency	Percent	Valid Percent
Up to 5000	46	12.9	13.2
5001 to 10000	35	9.8	10.1
10001 to 20000	65	18.2	18.7
20001 to 30000	51	14.3	14.7
30001 to 40000	31	8.7	8.9
40001 to 50000	25	7.0	7.2
50001 to 100000	53	14.8	15.2
100001 to 200000	19	5.3	5.5
More than 200000	23	6.4	6.6
Total	348	97.5	100.0

Q55

55a. Statistics on annual expenditures in KSH on:	Household items	Health	Education/ school	Agriculture	Livestock	Social affairs	Transport	Rent for agricultural land
Valid	314	174	269	233	210	123	212	22
Missing	43	183	88	124	147	234	145	335
Mean	37352.4841	13820.9195	52861.2751	40259.6996	18541.8381	8068.8130	10639.3396	8640.9091
Median	21600.0000	6000.0000	24000.0000	12000.0000	12000.0000	4000.0000	9600.0000	2450.0000
Minimum	2000.00	500.00	300.00	1000.00	500.00	400.00	200.00	1000.00
Maximum	360000.00	240000.00	500000.00	2338000.00	180000.00	60000.00	120000.00	65000.00
Sum	11728680.00	2404840.00	14219683.00	9380510.00	3893786.00	992464.00	2255540.00	190100.00

None of the interviewees was spending rent for housing.

55b. Household expenditures (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 10000	53	14.8	16.9
10001 to 15000	43	12.0	13.7
15001 to 20000	27	7.6	8.6
20001 to 25000	75	21.0	23.9
25001 to 50000	50	14.0	15.9
50001 to 75000	38	10.6	12.1
75001 to 150000	19	5.3	6.1
More than 150000	9	2.5	2.9
Total	314	88.0	100.0

55c. Health expenditures (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 1000	12	3.4	6.9
1001to 2000	18	5.0	10.3
2001 to 3000	15	4.2	8.6
3001 to 4000	10	2.8	5.7
4001 to 8000	43	12.0	24.7
8001 to 12000	40	11.2	23.0
12001 to 24000	17	4.8	9.8
24001 to 48000	8	2.2	4.6
More than 48000	11	3.1	6.3
Total	174	48.7	100.0

55d. Education/school expenditures (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 2500	29	8.1	10.8
2501 to 5000	29	8.1	10.8
5001 to 10000	22	6.2	8.2
10001 to 20000	44	12.3	16.4
20001 to 40000	51	14.3	19.0
40001 to 60000	31	8.7	11.5
60001 to 100000	23	6.4	8.6
100000 to 200000	25	7.0	9.3
More than 200000	15	4.2	5.6
Total	269	75.4	100.0

55e. Agriculture expenditures (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 2500	14	3.9	6.0
2501 to 5000	42	11.8	18.0
5001 to 10000	39	10.9	16.7
10001 to 20000	48	13.4	20.6
20001 to 40000	53	14.8	22.7
40001 to 60000	13	3.6	5.6
60001 to 100000	8	2.2	3.4
More than 100000	16	4.5	6.9
Total	233	65.3	100.0

55f. Livestock expenditures (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 2500	26	7.3	12.4
2501 to 5000	31	8.7	14.8
5001 to 10000	44	12.3	21.0
10001 to 20000	53	14.8	25.2
20001 to 40000	34	9.5	16.2
40001 to 60000	13	3.6	6.2
More than 60000	9	2.5	4.3
Total	210	58.8	100.0

55g. Social expenditures (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 1000	14	3.9	11.4
1001 to 2000	24	6.7	19.5
2001 to 4000	24	6.7	19.5
4001 to 6000	24	6.7	19.5
6001 to 10000	10	2.8	8.1
10001 to 20000	15	4.2	12.2
More than 20000	12	3.4	9.8
Total	123	34.5	100.0

55h. Transport expenditures (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
Up to 2000	21	5.9	9.9
2001 to 4000	36	10.1	17.0
4001 to 6000	38	10.6	17.9
6001 to 12000	89	24.9	42.0
12001 to 24000	18	5.0	8.5
More than 24000	10	2.8	4.7
Total	212	59.4	100.0

55i. Rent for agricultural land (annually in KSH) (grouped)	Frequency	Percent	Valid Percent
1000.00	1	.3	4.5
1400.00	1	.3	4.5
1500.00	4	1.1	18.2
1800.00	1	.3	4.5
2000.00	3	.8	13.6
2400.00	1	.3	4.5
2500.00	1	.3	4.5
3000.00	2	.6	9.1
4000.00	2	.6	9.1
5000.00	1	.3	4.5
6000.00	1	.3	4.5
7000.00	1	.3	4.5
12000.00	1	.3	4.5
60000.00	1	.3	4.5
65000.00	1	.3	4.5
Total	22	6.2	100.0

55j. All annual household expenditures (in KSH)	Statistics
Valid	350
Missing	7
Mean	128758.8657
Median	70800.0000
Minimum	5000.00
Maximum	2757000.00
Sum	45065603.00

55k.l All annual household expenditures (in KSH)	Frequency	Percent	Valid Percent
Up to 20000	36	10.1	10.3
20001 to 40000	54	15.1	15.4
40001 to 60000	64	17.9	18.3
60001 to 80000	37	10.4	10.6
80001 to 100000	24	6.7	6.9
100001 to 120000	25	7.0	7.1
120001 to 240000	57	16.0	16.3
240001 to 480000	40	11.2	11.4
More than 480000	13	3.6	3.7
Total	350	98.0	100.0

55l. All annual household expenditures divided by household members (in KSH)	Statistics
Valid	350
Missing	7
Mean	27185.4577
Median	14733.3333
Minimum	750.00
Maximum	462000.00
Sum	9514910.20

55m. All annual household expenditures divided by household members (in KSH)	Frequency	Percent	Valid Percent
Up to 5000	40	11.2	11.4
5001 to 7500	36	10.1	10.3
7501 to 10000	35	9.8	10.0
10001 to 15000	66	18.5	18.9
15001 to 20000	33	9.2	9.4
20001 to 30000	49	13.7	14.0
30001 to 50000	43	12.0	12.3
50001 to 70000	25	7.0	7.1
More than 70000	23	6.4	6.6
Total	350	98.0	100.0

55n. (All annual hh income (revenue and external)+ annual expenditures)/2 in KSH	Statistics
Valid	343
Missing	14
Mean	242062.1822
Median	117600.0000
Minimum	6850.00
Maximum	10568100.00
Sum	83027328.50

55o. (All annual hh income (revenue and external)+ annual expenditures)/2 in KSH	Frequency	Percent	Valid Percent
Up to 25000	23	6.4	6.7
25001 to 50000	44	12.3	12.8
50001 to 75000	42	11.8	12.2
75001 to 100000	45	12.6	13.1
100001 to 150000	60	16.8	17.5
150001 to 200000	37	10.4	10.8
200001 to 500000	63	17.6	18.4
More than 500000	29	8.1	8.5
Total	343	96.1	100.0

55p. (All annual hh income (revenue and external)+ annual expenditures)/2 divided by hh members in KSH	Statistics
Valid	343
Missing	14
Mean	67074.9594
Median	23816.6667
Minimum	1979.43
Maximum	5284050.00
Sum	23006711.08

55q. (All annual hh income (revenue and external)+ annual expenditures)/2 divided by hh members in KSH	Frequency	Percent	Valid Percent
Up t 10000	61	17.1	17.8
10001 to 20000	88	24.6	25.7
20001 to 30000	55	15.4	16.0
30001 to 40000	36	10.1	10.5
40001 to 60000	45	12.6	13.1
60001 to 100000	29	8.1	8.5
More than 100000	29	8.1	8.5
Total	343	96.1	100.0

55r1.Statistics	PROJECT PARTICIPANTS	
	(All annual hh income (revenue and external)+ annual expenditures)/2 in KSH	(All annual hh income (revenue and external)+ annual expenditures)/2 divided by hh members in KSH
Valid	131	131
Missing	4	4
Mean	319351.8282	84158.0904
Median	168242.0000	34993.7500
Minimum	11200.00	3733.33
Maximum	6080900.00	3040450.00
Sum	41835089.50	11024709.85

55r2. (All annual hh income (revenue and external)+ annual expenditures)/2 in KSH	PROJECT PARTICIPANTS		
	Frequency	Percent	Valid Percent
Up to 25000	3	2.2	2.3
25001 to 50000	9	6.7	6.9
50001 to 75000	12	8.9	9.2
75001 to 100000	13	9.6	9.9
100001 to 150000	25	18.5	19.1
150001 to 200000	19	14.1	14.5
200001 to 500000	33	24.4	25.2
More than 500000	17	12.6	13.0
Total	131	97.0	100.0

55r3. (All annual hh income (revenue and external)+ annual expenditures)/2 divided by hh members in KSH	PROJECT PARTICIPANTS		
	Frequency	Percent	Valid Percent
Up t 10000	10	7.4	7.6
10001 to 20000	28	20.7	21.4
20001 to 30000	21	15.6	16.0
30001 to 40000	16	11.9	12.2
40001 to 60000	26	19.3	19.8
60001 to 100000	12	8.9	9.2
More than 100000	18	13.3	13.7
Total	131	97.0	100.0

55s1.Statistics	WOMEN HEADED HH	
	(All annual hh income (revenue and external)+ annual expenditures)/2 in KSH	(All annual hh income (revenue and external)+ annual expenditures)/2 divided by hh members in KSH
Valid	54	54
Missing	5	5
Mean	359050.4074	124477.1468
Median	119075.0000	29200.0000
Minimum	6850.00	2992.86
Maximum	6080900.00	3040450.00
Sum	19388722.00	6721765.93

55s2. (All annual hh income (revenue and external)+ annual expenditures)/2 in KSH	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Up to 25000	4	6.8	7.4
25001 to 50000	8	13.6	14.8
50001 to 75000	4	6.8	7.4
75001 to 100000	8	13.6	14.8
100001 to 150000	9	15.3	16.7
150001 to 200000	3	5.1	5.6
200001 to 500000	12	20.3	22.2
More than 500000	6	10.2	11.1
Total	54	91.5	100.0

55s3. (All annual hh income (revenue and external)+ annual expenditures)/2 divided by hh members in KSH	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Up t 10000	7	11.9	13.0
10001 to 20000	10	16.9	18.5
20001 to 30000	11	18.6	20.4
30001 to 40000	4	6.8	7.4
40001 to 60000	9	15.3	16.7
60001 to 100000	6	10.2	11.1
More than 100000	7	11.9	13.0
Total	54	91.5	100.0

55t1. All household income from revenue and external sources in KSH divided by hh members (grouped)	Statistics in KSH (annual)	Statistics in USD (annual)	Statistics in USD (daily)
Valid	348	348	348
Missing	9	9	9
Mean	105233.7038	1057.09	2.9
Median	25845.2381	259.62	0.711
Minimum	300.00		
Maximum	10106100.00		
Sum	36621328.92		

55t2. All household income from revenue and external sources in KSH divided by hh members (grouped) – POVERTYLINES	Poverty line: 2 USD $ per day		Poverty line: 1.25 USD $ per day	
	N	%	N	%
Above poverty line	62	17.8	106	30.5
Under poverty line	286	82.2	242	69.5
Total	348	100.0	348	100.0

55t3. (All hh income (revenue and external)+ annual expenditures)/2 divided by hh members	Statistics in KSH (annual)	Statistics in KSH in USD (annual)	Statistics in USD (daily)
Valid	343	343	343
Missing	14	14	14
Mean	67074.9594	673.827	1.85
Median	23816.6667	239.243	0.65
Minimum	1979.43		
Maximum	5284050.00		
Sum	23006711.08		

55t4. (All hh income (revenue and external)+ annual expenditures)/2 divided by hh members – POVERTYLINES	Poverty line: 2 USD $ per day		Poverty line: 1.25 USD $ per day	
	N	%	N	%
Above poverty line	45	13.1	84	24.5
Under poverty line	298	86.9	259	75.5
Total	343	100.0	343	100.0

55t5. (All hh income (revenue and external)+ annual expenditures)/2 divided by hh members – POVERTYLINES	WOMEN HEADED HH			
	Poverty line: 2 USD $ per day		Poverty line: 1.25 USD $ per day	
	N	%	N	%
Above poverty line	11	20.4	19	35.2
Under poverty line	43	79.6	35	64.8
Total	54	100.0	59	100.0

55t6. (All hh income (revenue and external)+ annual expenditures)/2 divided by hh members – POVERTYLINES	PROJECT PARTICIPANTS			
	Poverty line: 2 USD $ per day		Poverty line: 1.25 USD $ per day	
	N	%	N	%
Above poverty line	24	18.3	43	32.8
Under poverty line	107	81.7	88	67.2
Total	131	100.0	131	100.0

Q56

56a. Assess economic situation of the household	Frequency	Percent	Valid Percent
Very poor, there is sometimes even not enough food available	6	1.7	1.7
Poor, but have no food problems and only sometimes problems buying clothes	57	16.0	16.5
Moderate, enough money for food clothes, health care, school	246	68.9	71.1
Moderate, enough money even for some luxurious objects like motorbikes, car, computer	35	9.8	10.1
Good, can run a good car, own a good house, have many luxurious objects	2	.6	.6
Total	346	96.9	100.0

56b. Assess economic situation of the household	PEOJECT PARTICIPANTS		
	Frequency	Percent	Valid Percent
Poor, but have no food problems and only sometimes problems buying clothes	14	10.4	10.6
Moderate, enough money for food clothes, health care, school	95	70.4	72.0
Moderate, enough money even for some luxurious objects like motorbikes, car, computer	23	17.0	17.4
Total	132	97.8	100.0

56c. Assess economic situation of the household	WOMEN HEADED HH		
	Frequency	Percent	Valid Percent
Very poor, there is sometimes even not enough food available	1	1.7	1.8
Poor, but have no food problems and only sometimes problems buying clothes	14	23.7	24.6
Moderate, enough money for food clothes, health care, school	31	52.5	54.4
Moderate, enough money even for some luxurious objects like motorbikes, car, computer	11	18.6	19.3
Total	57	96.6	100.0

Q57

57a. First priority of household in case of additional money	Frequency	Percent	Valid Percent
Better Food	93	26.1	27.2
Better Clothes	1	.3	.3
Repair house	13	3.6	3.8
Better health services	2	.6	.6
Better schools	47	13.2	13.7
Better water	2	.6	.6
Electricity supply	6	1.7	1.8
Buy car or motorbike	3	.8	.9
Open shop/business	17	4.8	5.0
Start Professional training	1	.3	.3
Buy livestock	82	23.0	24.0
Hire farm staff	1	.3	.3
Buy livestock goods/equipment	36	10.1	10.5
Buy agricultural goods/equipment	36	10.1	10.5
Greenhouse	2	.6	.6
Total	342	95.8	100.0

57b. Second priority of household in case of additional money	Frequency	Percent	Valid Percent
Better Food	28	7.8	8.1
Better Clothes	3	.8	.9
Repair house	16	4.5	4.6
Better health services	19	5.3	5.5
Better schools	32	9.0	9.2
Better water	12	3.4	3.5
Electricity supply	13	3.6	3.8
Buy car or motorbike	6	1.7	1.7
Open shop/business	24	6.7	6.9
Start Professional training	1	.3	.3
Buy livestock	79	22.1	22.8
Hire farm staff	3	.8	.9
Buy livestock goods/equipment	46	12.9	13.3
Buy seeds	4	1.1	1.2
Buy agricultural goods/equipment	60	16.8	17.3
Total	346	96.9	100.0

57c. Third priority of Household in case of additional money	Frequency	Percent	Valid Percent
Better Food	12	3.4	3.6
Better Clothes	4	1.1	1.2
Repair house	43	12.0	13.0
Better health services	60	16.8	18.1
Better schools	60	16.8	18.1
Better water	13	3.6	3.9
Electricity supply	15	4.2	4.5
Buy car or motorbike	8	2.2	2.4
Open shop/business	16	4.5	4.8
Start Professional training	1	.3	.3
Buy livestock	31	8.7	9.4
Buy livestock goods/equipment	37	10.4	11.2
Buy agricultural goods/equipment	30	8.4	9.1
Dowry payment	1	.3	.3
Total	331	92.7	100.0

57d. All mentioned priorities	First Priority		Second Priority		Third Priority		All priorities	
	N	%	N	%	N	%	N	%
Better Food	93	27.2	28	8.1	12	3.6	133	13.1
Better Clothes	1	.3	3	.9	4	1.2	8	.8
Repair house	13	3.8	16	4.6	43	13.0	72	7.1
Better health services	2	.6	19	5.5	60	18.1	81	7.9
Better schools	47	13.7	32	9.2	60	18.1	139	13.6
Better water	2	.6	12	3.5	13	3.9	27	2.6
Electricity supply	6	1.8	13	3.8	15	4.5	34	3.3
Buy car or motorbike	3	.9	6	1.7	8	2.4	17	1.7
Open shop/business	17	5.0	24	6.9	16	4.8	57	5.6
Start Professional training	1	.3	1	.3	1	.3	3	.3
Buy livestock	82	24.0	79	22.8	31	9.4	192	18.8
Hire farm staff	1	.3	3	.9	0	.0	4	.4
Buy livestock goods/equipment	36	10.5	46	13.3	37	11.2	119	11.7
Buy seeds			4	1.2	0	.0	4	.4
Buy agricultural goods/equipment	36	10.5	60	17.3	30	9.1	126	12.4
Other	2	.6	0	.0	1	.3	3	.3
Total	342	100.0	346	100.0	331	100.0	1019	100.0

57e. Other household priorities	Frequency	Percent	Valid Percent
None	342	95.8	95.8
Biogas construction	2	.6	.6
Buy cows for dowry payment	1	.3	.3
Buy land	6	1.7	1.7
Increase business	1	.3	.3
Increase land for cropping	1	.3	.3
Plant tea	3	.8	.8
Rearing of chicken	1	.3	.3
Total	357	100.0	100.0

Q58

58. Evaluation of interview	Frequency	Percent	Valid Percent
Sincere	229	64.1	65.2
Not Sincere	8	2.2	2.3
Can not estimate the sincerity	114	31.9	32.5
Total	351	98.3	100.0

ANNEX C.
CONVERSION OF WEIGHTS AND VOLUMES

Category	Plant type	Units	Conversion per unit in kgs	Remarks
Food Crops				
	Dry Beans	bags/sack	90	
	Green beans	crates	15	
	Potatoes	bags /sack	150	
		Debes	20	
	Dry Maize	bags/sack	90	
	Green maize	bag/sack	150	
	Onion	nets	10	
	Pumpkin	pieces	4	
	Sugar cane	manload	70	
		womanload	90	
		stem	5	
	Tomatoes	crates	50	
	yams	bags/sacks	150	
Vegetables				
	Kales	bunches	0.25	
	Cabbages	pieces	2.5	
	Avocado	bags	200	
	Bananas	trunk	30	
		bunches	4	
Fodder				
	Fresh Napier Grass	w/burrow	100	
		manload	70	
		womanload	90	
		bundles	n/a	
	Chopped Napier	debe	15	
		bag/sack	80	
	Sweet potatoes vines	w/burrow	100	
		manload	70	
		womanload	90	
	Dry hay	bails	30	
	Fresh grass	w/burrow	100	
		manload	70	
		womanload	90	
		pieces	n/a	
energy	Wood			
		Logs	n/a	
		Sacks	70	
		Backload	60	
		W/burrow	60	
		Trailor	800	
	Charcoal			
		bags	70	
		debes	10	
		mkebe (tin)	1	

Source: Local assistant, measurements during field visit on local markets and ILRI.

ANNEX D.
LIST OF INDIGENOUS TREES MENTIONED IN THE HOUSEHOLD SURVEY

Name of Tree	Planted trees	
	N	%
Biribriet	1	0.55
Bodo	1	0.55
Chebitoik	2	1.1
Chemakaldet	1	0.55
Chepnoewet	2	1.1
Getibalaya	1	0.55
Grotton	1	0.55
Jacaranda	1	0.55
Kagarwet	1	0.55
Kenduiywet	1	0.55
Kimolwet	1	0.55
Lamaiwet	5	2.75
Marindari	1	0.55
Masimetonic	1	0.55
Masineitet	35	19.25
Mchai	1	0.55
Menellins	1	0.55
Mobeet	10	5.5
Moboniek	1	0.55
Mogoiwet	3	1.65
Moseneitat	1	0.55
Oriot	1	0.55
Prunus Efricana	1	0.55
Sagawatiet	8	4.4
Sayet	4	2.2
Senetwet	2	1.1
Sikswet	1	0.55
Siriat	1	0.55
Sogot	1	0.55
Sogowotiet	1	0.55
Soiyet	7	3.85
Tebesonik	32	17.6
Tebeswet	41	22.55
Teldet	1	0.55
Tendwet	6	3.3
Wattle trees	1	0.55
Total	180	100