

Mitigation of Climate Change in Agriculture (MICCA) Programme
Background Report 3

Socio-economic Survey CARE-MICCA Pilot Project in the United Republic of Tanzania

Final report



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MICCA Programme

Pilot Project:

Enhancing climate change mitigation within the CARE Hillside Conservation Agriculture Project (HICAP) in the United Republic of Tanzania

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ACRONYMS AND ABBREVIATIONS

AESA	Agro-ecosystem analysis
CA	Conservation Agriculture
EX-ACT	<i>Ex-Ante</i> Carbon-balance Tool
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer Field Schools
Global Positioning System	GPS
HICAP	Hillside Conservation Agriculture Project
ICRAF	The World Agroforestry Center
MICCA Programme	Mitigation of Climate Change in Agriculture Programme
TSH	Tanzanian Shillings
USD	US Dollar (1 USD = 1758 TSH, October 2011)
VSL	Village Savings and Loans

0. EXECUTIVE SUMMARY

The main goal of FAO's Mitigation of Climate Change in Agriculture (MICCA) Programme is to facilitate the contribution of developing countries to the mitigation of climate change in agriculture and supporting them towards adopting low-carbon emission agriculture. The Programme also supports FAO's primary objective of improving food security, nutrition and agricultural productivity. In the United Republic of Tanzania, the MICCA Programme is cooperating with CARE International and the World Agroforestry Centre (ICRAF) within the framework of CARE's Hillside Conservation Agriculture Project (HICAP). The objective of the cooperation is to broaden the perspective of the project, which currently focuses on conservation agriculture (CA), to include climate change mitigation.

The objective of the socio-economic survey is to collect data on livelihoods, agricultural practices and climate change awareness among small-holder farmers in the project areas. The survey design can be utilized later or adjusted so that it can serve as a tool to evaluate the outcomes and impacts on the socio-economic situation of activities from other MICCA Programme activities in such areas as capacity development and greenhouse gas assessment.

The survey was carried out in the Uluguru Hills. Data was collected in five villages that are representative of the terrain and population, with a total of 333 farmers interviewed. At least two focus group discussions were conducted in each village. The team is aware of possible interviewer effects and other factors that may affect the validity and reliability of data. At several points, it is emphasized that the findings should be treated carefully and considered as estimates rather than hard data.

The percentage of HICAP participants in the sample is quite low (17.4 percent). Farmers are involved in several activities simultaneously and most participate in groups, such as Farmer Field Schools (FFS) or VSL (Village Saving and Loans). Through these groups, farmers have access to specific services and training opportunities provided by HICAP.

Due to a lack of electricity, electrical appliances, such as televisions and refrigerators, are not common. This is also true for vehicles, as in most places the terrain does not allow for riding bicycles or driving cars. The main means of communication and sources of information are radios and mobile phones. Wood is the predominant source of energy used by local households.

Three-quarters of farmers practice cropping and raise livestock. The rest engage in cropping only. Farm assets are very basic (hoe and shovel). Only a few households own improved tools. The majority of households consume their own products and sell any surplus (91.6 percent). Animals raised as livestock are mainly poultry, goats and sheep. Larger farm animals are not found in the area. About 18 percent say they use CA techniques. Others practice 'traditional' agriculture (slash and burn, scattered planting, mixed cropping). Almost half the farmers practice slash and burn. It is worth noting that cultural beliefs are the main reasons given for following these traditional practices. Lack of awareness about the impact of these practices and possible alternatives are also cited as reasons for their continued use. These practices are also considered easy and time saving, so the likelihood farmers will continue to use them is high.

The mean size of cultivated land is 2.5 acres (median 2 acres) per farmer. More than half of all farmers cultivate their own land. More than a third work on rented land. Only 5 percent use irrigation.

The most striking problem for interviewees with regard to agriculture are diseases (27.2 percent of all given answers), followed by low yields (19.3 percent), low rainfall (14 percent) and prolonged dry

seasons (9.7 percent). Climate variability is considered a problem mostly in terms of insufficient rainfall that leads to low yields.

More than a quarter of all planted crops are maize, followed by cassava and paddy. Banana, sorghum and sesame are also cultivated. Intercropping is practiced by both project participants and non-participants. Due to a general shortage of larger animals, only two farmers apply manure to their crops. There was no indication that fertilizers, herbicides or pesticides are used. Crop selection is not nutritiously balanced, but does allow farmers to store food for a few months. Main household incomes are generated by selling maize, sorghum, sesame, cassava and chicken. The revenue from crop sales are 33 percent higher for project participants than for non-participants. Generally higher yields per crop can be found among project participants, which could be the result of a number of factors, including the use of CA, participation in VSL or an ability to invest in equipment.

Project participants practice predominantly CA principles, such as planting in rows (84.5 percent), avoiding slash and burn (79.3 percent), double digging (70.7 percent), mulching (70.7 percent) and no or minimum tilling (62.1 percent). The findings show that CA techniques are also used by 10 percent of the sample who are non-participants. This could be a sign that project participants are having a 'multiplier' effect. Based on HICAP's definition, 22 cases (6.6 percent) from this sample can be considered CA 'adopters'.

The decision to use CA principles is made by women and men equally. The main motivational factor is the expectation of higher yields (43.1 percent) and higher incomes (9.7 percent) leading to better livelihoods. Farmers are hesitant to join the project, as they first want to see for themselves that the new practices work. One-fifth of the farmers had to make initial investments when starting to use CA. About half of the farmers said they had ongoing costs, primarily for additional labour and equipment.

The main benefits of CA are seen in higher yields, which lead to surplus production and potentially increased incomes and food security. Farmers mention that CA may be more labour-intensive in the beginning when preparing and cultivating the land. However, once the fields are planted, CA requires less work, and less land needs to be cultivated to obtain high yields. A small group expressed the view that CA had disadvantages, saying that it was too time consuming, involved increased costs, offered no immediately visible profits and produced unsatisfactory yields.

Although only few farmers shared the exact figures of additional income due to CA, incomes did increase due to higher yields of maize, sesame, paddy, sorghum and pigeon peas. The findings indicate that investments can be recovered relatively quickly through increased income. This allowed one-quarter of the farmers practicing CA to open crop-based businesses, such as restaurants and shops.

Farmers gave the following reasons for not joining the project or using CA: lack of knowledge about the project and CA; and insufficient time and finances. Only in focus group discussions, was a lack of trust in HICAP mentioned as a reason for not joining the project and adopting CA. Clearer communications and more work with local 'multipliers' may be a way to gain the trust of local farmers. The majority of non-practitioners require more information about the project, as well as training sessions and assistance from the project. They would also need to own more equipment, witness successful examples and have lower initial costs.

About 30 percent of all the farmers interviewed said they were always able to provide food for their families. About 60 percent said they were able to do this for at least three months. It is reassuring to see that only a few cases (6 or 1.8 percent) were not able to provide food for their families at all or for less than three months (31 cases, 9.4 percent).

Statements given to explain climate change relate primarily to changes in rain patterns. The statements are observations of changes in the weather rather than explanations for it. Rain patterns have changed in a way that makes it difficult for farmers to plan ahead and produce the same yields as in the past. This leads to food shortages and decreased livelihoods. However, more than half of the sample have not make any adjustments to prepare for or adapt to these changes. Others have adapted by planting more drought-resistant crops or adopting CA and other farming techniques.

The main source of income is cropping and raising livestock, with most of the economically active household members involved in those sectors. The balanced income in this sample is considerably low; only one-third of the national average. Using the World Bank poverty lines of 2 USD and 1.25 USD per day per head, only two households and its members live above the poverty line of 1.25 USD per day, and only one household above the poverty line of 2 USD per day. The findings emphasize that the population in the project area earn their livelihoods from their own farming and practice more or less subsistence agriculture. About a third of the respondents considers themselves as very poor, and more than a third as poor. The remaining third describe their household situation as moderate, with enough money for basics such as school, food and clothing. If additional money were to become available, the most stated household priorities would be home repairs (25.9 percent of all answers) and better food (19.9 percent). Those basic needs are a testament to the impoverished socio-economic household situation in the area.

To improve livelihoods and introduce climate change themes into HICAP activities, possible entry points for the MICCA Programme could be:

I. raising awareness about climate change and CA's potential to help farmers adapt to and mitigate climate change by:

- increasing farmers' knowledge about the causes of climate change;
- emphasizing and supporting the 'proper' application of CA as a tool to assist farmers adapt to and mitigate climate change and providing technical training on other climate change mitigation practices; and
- developing clear communication strategies and materials on the costs and benefits of CA.

II. raising awareness on impact of slash and burn on climate by:

- demonstrating the negative impact of slash and burn on climate change;
- demonstrating that CA is an alternative to slash and burn and mitigates climate change; and
- developing clear messages on the cost and benefits of CA in comparison to slash and burn.

III. increasing tree planting and protection by:

- emphasizing the need for agroforestry as mean of generating income and as a climate change mitigation tool;
- developing a strategy to disseminate knowledge on tools and practices to increase reforestation (e.g. planting trees, setting up nurseries, maintaining trees); and
- finding ways for farmers to combine CA and agroforestry.

Possible interventions should address both men and women farmers, and not just target project participants as other villagers are learning from participants about CA. Project participants should be trained to become 'multipliers' in the village to ensure greater community acceptance and increase the project's presence in more remote hamlets. This would also help overcome cultural beliefs that cause some villagers to mistrust outside interventions. Besides purely technical training, clear messages need to be developed showing the cost and benefits of training and the possible increased revenues obtained through CA over the long term.

1. INTRODUCTION

1.1 The MICCA Programme and its pilot projects

Working within FAO's main programme of work on improving food security, nutrition and sustainable agricultural production, the 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 greenhouse gas emissions and a high potential for their reduction.

1.2 CARE 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 the United Republic of Tanzania, the pilot project works to integrate climate-smart agricultural practices into existing agricultural development projects while maintaining the focus on food security, environmental sustainability and poverty alleviation. In the South Uluguru Mountains, HICAP, a CARE project, aims at improving livelihoods through the integration of CA into farming systems. In working with CARE HICAP, which is mainly funded by Howard G. Buffet Foundation, ICRAF and the MICCA Programme provide an opportunity to add value to the community-based CA practices being implemented by HICAP by clarifying the mitigation potential of these practices and integrating trees on farms and in the surrounding landscape. With suitable methodologies the pilot project will measure the increases in carbon accumulation across the landscape that result from adopting climate-smart practices. These measurements will provide evidence of the contribution smallholder farmers can make to mitigate the impacts of climate change while increasing productivity and ecosystem resilience (Background taken from the Project Proposal, MICCA 2011).

Since 2009, HICAP has been working in 15 villages in the Kolero, Kasanga and Bungu wards. To date, 38 VSLs and 58 FFS have been established and provided with training. Extension workers have also trained contact farmers who play an important role in each community by serving as the link between the community, the extension workers and the HICAP team. A Center for Sustainable Living, which serves as a training and gathering place, has been established in Kolero. Seventy demonstration plots have been cultivated and are being maintained by FFS and contact farmers. The number of demonstration plots continues to increase. Training sessions on specific CA practices have been conducted and farmers have been able to bring in their first harvests using these practices.

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 greater knowledge about the impacts of climate change among small-holder farmers in the project areas before joint MICCA Programme/HICAP interventions are implemented. Project partners have been working with the respective communities for almost three years. The project's initial impact and changes in farmers' livelihoods are clearly visible. In 2009 and 2011, partner organizations undertook baseline and mid-term reviews. These were conducted by consultants from the Sokoine University of Agriculture and covered a number of villages in which CARE is implementing its CA activities. They provide an excellent overview of the socio-economic

situation in the area and insights into agricultural practices and knowledge. Data from this socio-economic survey should be understood as a snapshot of the current situation.

In addition, the results from this survey should assist the MICCA Programme and project partners to take steps toward drafting a sustainable and locally adapted action plan. The work was done in collaboration with colleagues in MICCA Programme's working in the areas of capacity development and greenhouse gas assessment to survey and develop climate-related awareness activities.

The study design (described in detail in the next chapter) was developed for the present study and should be utilized as an evaluation tool after the three-year pilot 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

At least two larger quantitative studies have been conducted in CARE HICAP project sites over the last few years, and interviews conducted for a number of project reports. To counter resistance from the population and reduce potential frustrations caused by the arrival of yet another survey team, locations had to be found that had not been visited too often or too recently by study teams. At the same time, the locations had to be representative for the overall project sites (15 villages).

The terrain in the project area ranges from 391m to 1 244m in altitude. Villages had to be found that are typical of such a hilly area in terms of their access to markets, the number of inhabitants, agricultural production and infrastructure. After discussions with the project team on the ground, the following five villages were included in the sample:

Table 1. Location characteristics

Location	Mlagano	Balani	Kasanga	Kizagila	Kolero
# population	1089	1030	1806	596	2003
Altitude (metres above sea level)	266 (low)	484 (medium)	814 (medium)	1125 (high)	410 (medium)
Access to market	poor	poor	moderate	poor	good

In terms of altitude, 25 percent of all project villages are located at a high altitude; 42 percent at medium altitude; and 32 percent at a low altitude. The ratio is therefore more or less 1 (low) – 2 (medium) – 1 (high)¹. Kolero was added as it is one of HICAP's most active sites and a major focal point for the project. In each of the communities, 72 questionnaires were to be conducted, along with two focus group discussions and interviews with key informants. Two days were allocated for data collection in each location. Focus group discussions were also conducted in Lubasazi, a low-altitude village, with good access to markets and a population of 1 532 people.

According to CARE records, the overall population in the project villages is 18 326 people. Using an average of 4.9 persons per household in rural areas of the country (Census 2002: 168), the area includes about 3 740 households². Taking a confidence level of 95 percent and a confidence interval of 5.5 percent, a sample size of 293 households should be surveyed. Using a lower confidence interval of 5 percent, a sample size of 348 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 percent confidence level); p = percentage picking a choice, expressed as decimal; c = confidence interval, expressed as decimal.³

¹ It should be noted that the altitude within villages vary considerably, hamlets or single households can be located hours of hiking away, up the mountains. Therefore, the term 'altitude of villages' needs to be treated carefully.

² The number of 4 948 households in the area was provided after the preparation phase of the survey. When using this figure and a confidence interval of 5.5 percent, 298 households should be interviewed, using 5 percent 357 households. Fortunately, the envisioned 360 households would still be representative.

³ Source: <http://www.surveysystem.com/sample-size-formula.htm>

Due to time constraints and feasibility, a sample size of 360 households was agreed on. This allowed interviews to be conducted in 72 households per location by six enumerators in ten days. Most of the locations consist of several sub-divisions, called hamlets. Caution was given to have the respective hamlets represented in the sample accordingly.

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 adaptation strategies.

In addition to the quantitative household survey, focus group discussions with farmer groups, stakeholders and key informants were carried out. The questions developed for those interviews have to be understood primarily as guiding questions. Discussions were expanded to other topics where possible. Discussions with extension officers and farmers highlighted expected land use changes, such as a decline in grasslands, more tea plantations (if prices remains good), more fodder production, more deforestation (if tea plantations increase), a reduction in food crops (maize), increases in high-value crops like passion fruit and a diminution of slash-and-burn practices. These land use changes have implications for climate change mitigation, which will be explored using the Ex-Ante Carbon-balance Tool (EX-ACT). In terms of deforestation, the agricultural officers estimated the actual forest cover at 4 percent, as compared to 10 percent in 2002.

2.3 Data collection

The survey was expected to follow a random selection approach. The team was asked to spread throughout the villages, starting from one central location and doing interviews at every third house. This approach was possible for Kolero and the first hamlets in Kasanga. The other villages required hiking up to three hours just to reach the center of the village. Considerably more time would have been needed to hike to remote households in other hamlets. A few weeks before the survey started, CARE had compiled a list of all household heads from which a random selection of households were selected. Hamlet leaders were asked to invite the randomly identified heads of households to one central location for interviews. As some households are located far away and some heads of household were not able to arrive in time, the sample size was reduced to 333 households. Taking in consideration the above calculations, this number is statistically sufficient to draw conclusions for the area.

Table 2. Outlines the number of interviewees conducted in each location.

Number of interviews per village	Kolero		Kasanga		Balani		Mlagano		Kizagila		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Household questionnaire	72	100.	64	100.	69	100.0	64	100.	64	100.	333	100.
Focus groups	2		2		2		2		2		2	

The team is aware that this selection process was not fully independent. It required cooperation with local leaders, which could be a risk factor in the data collection. However, given the short time frame and the available resources, this seemed to be the only feasible way to gain access to farmers living in remote and mountainous hamlets. Although the overall sample size decreased, the results should still be representative for the project area.

A two-day training session with enumerators, an assistant and a data clerk was organized. This included the testing of the survey instrument in Morogoro, followed by a round of feedback from the enumerators and editing of the final questionnaire. The data collection took place between 27 September and 10 October, 2011. Interviews were held in Swahili and translated into the local language if needed.

Each household was given a household code which will allow other project components to see 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.

The data in this survey is believed to be representative for households within the HICAP area. However, the team is aware that interviewer effects and other errors during the selection process and interviews may have occurred. As is common for such studies, the sample may 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.

3. FINDINGS

This section presents the main findings of the household questionnaire. Where applicable it also includes findings from focus group discussions. The analysis focuses on aspects that are the most important for the MICCA Programme at this time.

3.1 Demographics

The findings from the 333 households indicate that the average household has four members. The smallest household had one member, and the biggest had seven. In 250 households, there is at least one child. Using the median figure⁴, the findings indicate that in 50 percent of the households there are two adults and two children.

Table 3. Sex of interview partner

Sex of interview partner	Frequency	Percent	Valid Percent
Man	195	58.6	58.6
Woman	130	39.0	39.0
Boy	7	2.1	2.1
Girl	1	.3	.3
Total	333	100.0	100.0

In most of the cases where interviews were conducted in women-headed households, the interviewee was a woman. More than two-thirds of the women who head households are widowed (67.8 percent), a quarter are single and only 14 percent are married.

In three cases, a man is married to several women. This is an accepted practice amongst the Walguru tribe, which is by far largest ethnic group in this sample. Only two household are of the Wakaguru tribe. An extensive description of the Walguru tribe and their land tenure system (ownership, inheritance) can be found in the baseline survey conducted by Mvena (Mvena & Kilima 2009).

In 55 percent of all households, at least one person has never been to school. Many households (83 percent) have members that have already graduated from school. On average, each household has at least two people who have already graduated from school. More than half of all interviewed households have children currently in school. The current distribution of school-enrolled children is shown in Table 4:

Table 4. Number of household members currently in school

Number of household members currently in school	Frequency	Percent	Valid Percent
1	90	27.0	46.2
2	71	21.3	36.4
3	30	9.0	15.4
4	4	1.2	2.1
Total	195	58.6	100.0

⁴ Median is a statistical figure showing where exactly 50 percent of the given answers in the sample are, whereas the mean value will add all given values and divide by the number of cases. In smaller samples, like this study, the median is often the more precise than mean value, which is easily influenced by extreme marginal values. It will be clearly stated in this report which of value is being used.

3.2 Project participation

Only 17.4 percent of interviewees considered themselves as participants in HICAP⁵. The majority (82.6 percent) do not define themselves as such. By location, 16.7 percent of interviewees in Kolero are project participants; 14.1 percent in Kizagila; 9.4 percent in Kasanga; 7.2 percent in Balani; and 40.6 percent in Mlagano. The latter group is quite high and should be taken into consideration where necessary.

Three-quarters of this group are part of a FFS; half are part of a VSL; 43.1 percent received seeds from the project; 37.9 percent work on demonstration plots; 29.3 percent received training in agro-ecosystem analysis (AESA); and about a quarter participated in training of trainers and exchange visits. Only a few cases participated in more specific trainings offered by HICAP as shown in Tables 5.1 and 5.2.

Tables 5.1 and 5.2. Type of project participation

Project Participation (1)	1. Part of FFS		2. Training in AESA		3. Training in soil and water conservation		4. Training in sustainable pest management		5. Training in post harvest processing		6. Training in participatory technology development		7. Training in participatory varietal selection	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	42	72.4	17	29.3	13	22.4	4	6.9	4	6.9	1	1.7	4	6.9
No	16	27.6	41	70.7	45	77.6	54	93.1	54	93.1	57	98.3	54	93.1
Total	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0

Project Participation (2)	8. Training of trainers		9. Received CA tools		10. Received seeds		11. Work on demonstration plot		12. Exchange visits		13. Member of a VSL		14. Training to artisans	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	13	22.4	10	17.2	25	43.1	22	37.9	13	22.4	29	50	0	.0
No	45	77.6	48	82.8	33	56.9	35	60.3	45	77.6	29	50	58	100.0
Total	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0

The tables show that farmers have been involved in several activities. They are predominantly part of a group like the FFS or VSL, through which they have access to specific services and training opportunities provided by HICAP. The first participants joined the project by the end of 2009. The majority joined in the middle and the end of 2010.

3.3 Household and farm setting

3.3.1 Household assets and energy

Tables 6.1 and 6.2 show the different items owned by households in the area. Due to a lack of electricity, electrical appliances, such as televisions and refrigerators, are not common. This is also true for vehicles, as in most places the landscape does not allow for riding bicycles or driving cars. The main sources of information are radio (about two-thirds of the sample) and mobile phone (less than a quarter). The use of mobile phones can be very limited due to insufficient network coverage in the area.

⁵ HICAP receives the information about CA practitioners from contact farmers in the villages and keep records of FFS and VSL members. 'Project participants' are defined in this study as farmers who participated in one or more HICAP activities or consider themselves as participants.

Tables 6.1 and 6.2. Household assets (2)

Household assets (1)	1. Mobile phone		2. Bicycle		3. Motorcycle		4. Car or truck		5. Radio or stereo		6. TV set and/or DVD		7. Satellite dish	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	75	22.5	36	10.8	0	.0	2	.6	228	68.5	4	1.2	2	.6
No	258	77.5	297	89.2	333	100.0	331	99.4	105	31.5	328	98.8	331	99.4
Total	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0	332	100.0	333	100.0

Household assets (2)	8. Refrigerator		9. Own stand pipe		10. Own borehole or well		11. Own water tank		12. Access to shared well/borehole/stand pipe		13. Latrine/toilet	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	0	.0	6	1.8	137	41.1	1	.3	294	88.3	322	96.7
No	333	100.0	327	98.2	196	58.9	332	99.7	39	11.7	11	3.3
Total	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0

It is encouraging to see that 96.7 percent of all household say they own a latrine or a toilet. This high percentage runs contrary to the international trend in which households tend to have greater access to an improved water source than a sanitation system. In this survey, only a few household have access to an improved water resource, such as their own standpipe or water tank, whereas about 40 percent have their own borehole or well. In addition, 88 percent of all households have access to a shared well, borehole or standpipe. Based on the survey team's observations, it is apparent that farmers collect surface water and direct it to homesteads or fields where necessary (see picture 1, chapter 3.4.4).

Households were asked to identify their main source of energy. A disquieting 99.7 percent of all 333 households say wood is their main energy resource. Only one household uses charcoal, requiring about 50 kg per week for a family of four members.

Enumerators and interview partners faced difficulties measuring the volumes of wood consumed by each household. Forty-two households gave their wood consumption per week in kg. On average, this group requires 20 kg (median) of wood per week for the entire household, which comes to weekly average of 5.14 kg (median) per household member. Overall, the 42 households require 939 kg of wood per week. Caution has to be given when interpreting these figures as the sample is very small and the measurements are based on estimates made by interviewees and interviewers. In addition, the water content and density of wood plays an important role when estimating the consumed volume (Openshaw 1983).

It is very difficult to calculate the wood requirements in solid or loose head loads. Interviewers were advised to understand 'solid' head loads as thick branches and tree stems and should indicate the size of those pieces. Unfortunately, none of the enumerators gave measurements of the sizes of the head loads. The same applies to 'loose' head loads, which were understood as thinner and lighter branches of trees or bushes. The conversion in kg or cubic meters of consumed wood, in addition to general constraints regarding water content and density, is difficult and would lead to faulty estimates.

Nevertheless, 188 households use about two loose head loads per week of wood (overall 484 loose head loads), and 98 cases about two solid head loads of firewood (overall 210). Hypothetically, taking an average value for head loads of 26 kg (Openshaw 1983) or 28 kg (Malimbwi & Zahabu 2009: 197) suggested by literature for the United Republic of Tanzania, a weekly volume of 18 044 kg or 19 432 kg of wood is consumed by these households. Again, this is a very vague calculation based on many assumptions and subjective measurements. There is also no clear picture on national values as surveys are sometimes contradictory or present very different results (average of wood

requirements of 1 – 1.5 m³) depending on when and where the survey was taken (see Wiskerke 2008: 23). To avoid misinterpretation and working with unreliable data, a future survey should give attention to a more detailed and accurate collection of energy consumption data (by whom, when, sizes, weights etc). This is an important lesson learned from this survey. For now, possible changes in the amount of wood used for energy resulting from interventions by the MICCA Programme could only be measured in reduced numbers of head loads and not exact weights or volumes (assuming the same definition is used as in this survey).

3.3.2 Farm assets and farming practices

Three-quarters of the interviewed farmers practice cropping and keep livestock, whereas one-quarter practice cropping only. One household representative did not practice any kind of agriculture.

When asking interviewees about their farm assets, almost all said they owned a hoe (97.3 percent) and a machete (92.8 percent). About a third possesses tools such as a shovel (33.7 percent) and a thresher (32.5 percent). Farming assets such as improved hoes (also provided by CARE), ploughs, carts, tractors, no-till seeders or rippers are not common in the study area. Only a few isolated household own such items. About 40 percent of the interviewees own a barn for livestock and a storage facility for their goods. These findings indicate that agricultural practices are not very advanced, and that farmers lack funds to invest in improved equipment.

3.4 Types of agriculture practices

The main economic activity in the project area is agriculture, predominantly cropping. Horticulture and gardening is practiced by 16 percent of the sample; shifting cultivation by 12 percent; planting and harvesting trees by 5 percent; fish farming, harvesting bushes and fruits by less than 1 percent.

Twenty-eight cases said they practice subsistence farming and do not sell any surplus. The majority of households consume their own products and sell their surplus production (91.6 percent). No farmers producing strictly for commercial sales were identified in the sample. However, some farmers may produce and sell only one specific crop.

About 18 percent of the farmers in the sample practice CA. This group will be presented in more detail later. In focus group discussions, interviewees stated they plant seeds in a scattered and random manner, not in rows. They put several seeds (sometimes seeds of different crops) in the same hole. This practice allows some seeds to survive in case the others are killed by disease. Farmers also mix crops on a single plot without allocating a specific area (lines, patches) for each crop. Farmers say that these agricultural practices are traditional and that they are unaware of alternatives. However, they recognize that these practices do not produce yields large enough to create surpluses that could be sold.

3.4.1 Livestock

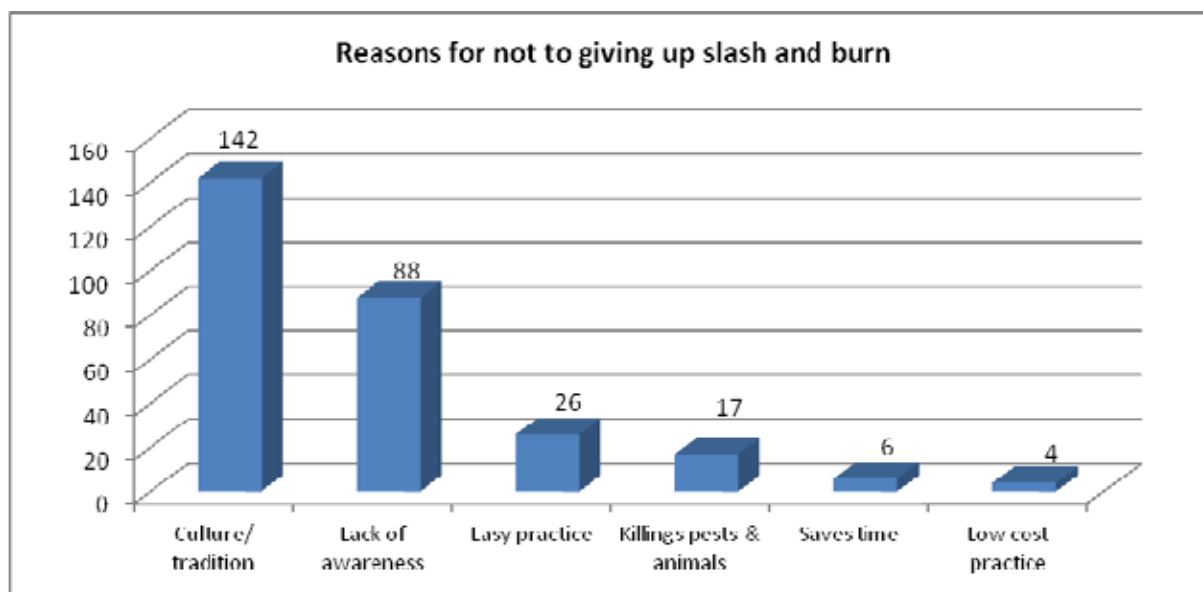
About 70 percent of the households raise chickens for their own consumption and to sell (one household reports having up to 70 chickens), and 20 percent own pigs and goats. Two households raise guinea pigs for meat. Larger animals like donkeys or cattle are not found in the area, and none of the interviewees own these animals. Cattle raising, which is not part of the Walguru culture, is done mostly by the Maasai (Mvena & Kilima 2009: 22f). However, in one of the focus group discussions the potential for raising dairy cattle was discussed. Farmers said they would benefit from having milk for their own consumption, which would improve the health of their children, and from the extra income earned by selling surplus milk.

3.4.2 Slash and burn

A major concern of HICAP is the common practice of slash and burn, which could be reduced by CA practices. Awareness raising activities have been carried out over the last two years, outlining the negative consequences of slash and burn and potential positive impact of CA. More than half (54.5 percent) of the interviewed farmers said they practice slash and burn. The findings raise the question: are the other 45.5 percent of the farmers really not practicing slash and burn or are they are aware of the fact the project is trying to eliminate this practice and have responded in a way that would be seen by the survey team as desirable.

Interviewees were asked to explain what slash and burn is. The most common response (42.3 percent) was that it was a practice to reduce grass; 19.1 percent of the interviewees said it was a cultural tradition; and 16.8 percent said it is a way to clear and prepare a farm. When asked about possible reasons why farmers practice slash and burn, 45.3 percent of all respondents stated that it is an easy practice; 18 percent said that it is done to kill pests and animals; 9 percent explained that it was a cultural tradition. Other reasons given were that it reduced grass (6.9 percent), cleared and prepared farmland (5.1 percent), provided ashes that could be reused (2.4 percent), was a low-cost practice (2.4 percent) and saved time (2.4 percent). A lack of awareness about alternatives was also cited as a reason for the continued practice of slash and burn (3.9 percent of interviewees).

Graph 1. Reasons for not giving up slash and burn



Graph 1 above displays the reasons why farmers do not give up the practice of slash and burn. It is striking that cultural beliefs are the main reasons, followed by a lack of awareness about the impact of this practice and possible alternatives. As it is also seen as an easy and time-saving practice, the likelihood farmers will continue to practice slash and burn remains high.

These findings from the questionnaire are supported by statements from focus group discussions. In these discussions, farmers said that slash and burn requires less labour and makes cultivation easier after burning the grass and weeds.

Addressing the knowledge gap about the impact and alternatives of slash and burn could be an entry point for future joint interventions by the MICCA Programme and HICAP. More in-depth awareness raising and training activities demonstrating different farming techniques and explaining the negative impact of slash and burn on agriculture and the climate cycle could inspire more farmers to abandon slash and burn. Promoting CA and other climate-smart agricultural practices would also highlight the costs and benefits of such practices in comparison to slash and burn.

3.4.3 Land tenure

More than half of all farmers cultivate on land they own. More than a third of them farm on rented land, and 18 percent farm on land that belongs to their clan and pay no rent. Only a few cases do their farming on CARE FFS demonstration plots or on communal land. Further details about land tenure can be found in the baseline survey from 2009 (Mvena et al 2009).

The mean size of cultivated land is 2.5 acres (median 2 acres) per farmer, ranging from 0.25 acres to 10 acres per farm. The overall land area used for cropping in the sample is 848.75 acres. The overall land areas used for agriculture are shown in table 7.

Table 7. Overall land area used for agriculture

Overall land size used for agriculture	Frequency	Percent	Valid Percent
Up to 0.5	13	3.9	3.9
0.51 to 1	54	16.2	16.3
1.1 to 2	106	31.8	31.9
2.1 to 3	72	21.6	21.7
3.1 to 4	56	16.8	16.9
More than 4	31	9.3	9.3
Total	332	99.7	100.0

3.4.4 Irrigation

About five percent of all interviewed farmers irrigate their fields, mostly using water from rivers. One household uses water from wells, and another from dams. As seen in picture 1, small water streams can be channeled to the required area by wooden pipes. The structures are often made of organic and flexible materials that can be adjusted depending on water availability. Lack of equipment and water shortages are the main problems farmers face regarding irrigation. Pests, seasonal water sources and invasion from animals were also mentioned.



Picture 1. Water pipe close to field

3.4.5 Problems in regard to agriculture

The most striking problem for interviewees regarding agriculture are diseases (27.2 percent of all given answers), followed by low yields (19.3 percent), low rainfall (14 percent) and prolonged dry seasons (9.7 percent). The latter problems are clearly interrelated, as the lack of sufficient water will result in low yields or the need to replant and spend more money.

Other aspects mentioned were a lack of equipment or farm implements (4.9 percent), poor soil fertility and invasion of animals, including monkeys. The problems with animals are linked to the lack of water for cattle in the surrounding area, which forces herders to come into the project area in search of water for their animals. Lack of land and unpredictable rainfall are other problems mentioned regarding agriculture. In focus group discussions, those two problems were mentioned several times.

Lack of sufficient and fertile land limits farmers' opportunities to improve their farming practices and make plans for adopting CA. Land is rented from clan leaders and may need to be returned without notice, leaving farmers without any source of income and possibly in debt for the investments made

to farm on the plot. In addition, clan leaders tend to rent out the most unproductive lands, making any kind of farming difficult. Often the plot size is very small, and farmers believe they cannot produce sufficient harvests from such small plots. Lack of finances also limits farmers' ability to pay for additional labour. Furthermore, farmers say they do not possess enough implements or machinery to improve their productivity through irrigation, tillage or ploughing. In focus groups, livestock and crop diseases were mentioned as the most striking problems facing farmers, along with prolonged dry seasons and low soil fertility due to high temperatures and lack of rain.

The answers show that climate variability is considered a problem, particularly insufficient rainfall leading to low yields. Changes in temperature and other characteristics of climate variability are mentioned in only a few cases. Lack of rain is the most striking aspect of climate variability.

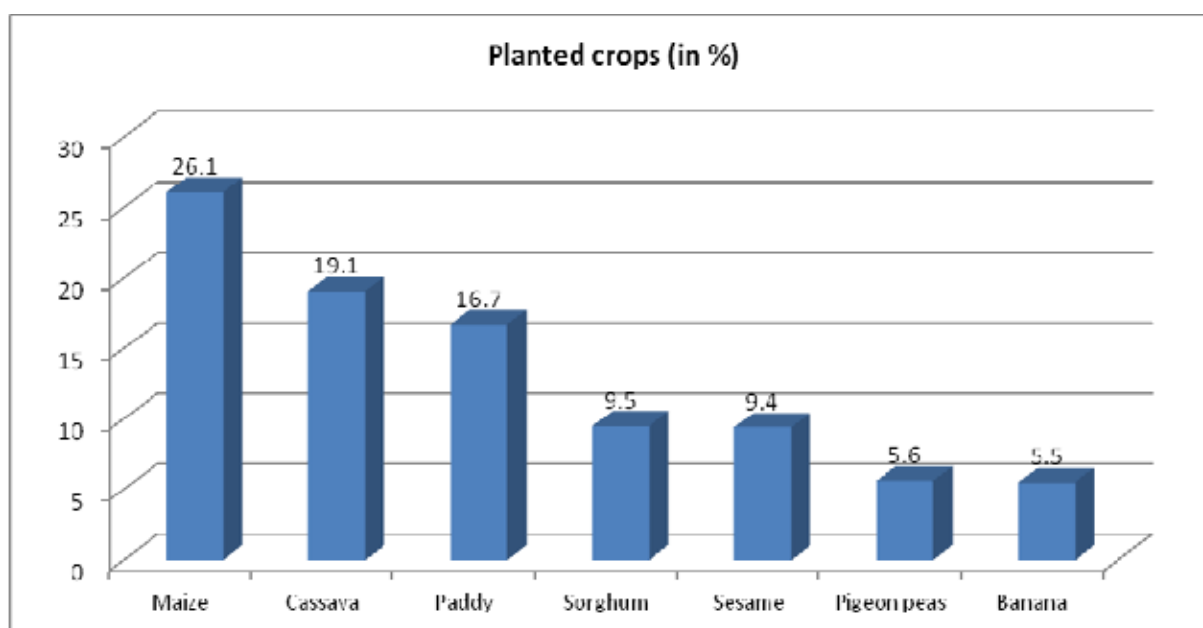
Increased cooperation with local leaders and clan leaders regarding land tenure could be a further entry point for the MICCA Programme. Approaches need to be found that would allow farmers to make long-term plans and investments on land they rent without fearing the loss of their land when harvest comes.

3.5 Cropping and yields

The majority of farmers interviewed cultivate more than one plot. About two-thirds have three or four plots. The land sizes vary, and the overall figures have been stated above. Looking at the median, 50 percent of all farmers plant one crop per plot. The mean is between 1.15 and 1.42 crops per plot, with 3 types of crop per plot as the maximum. Intercropping several crops on one field is a practice promoted by HICAP. However, with regard to intercropping, there is no significant difference between HICAP project participants or farmers stating they practice CA and non-participants.

These figures do not indicate if intercropping is done in a climate-smart way (alternating crops by row) or, as mentioned earlier, by planting crops in a random and uncontrolled manner in one plot. Although farmers own several plots, most farmers plant the same crops on several fields. For this reason, the number of crops cultivated on all plots is quite high.

Graph 2. Planted crops (in %)



As seen in graph 2, maize accounts for more than a quarter of all planted crops, followed by cassava and paddy⁶. Farmers consider cassava a nutritious drought-resistant crop. Consequently, they plant it more often now than in the past. The overall land used for all farmers in the sample for maize is 222.75 acres; for paddy 121.5 acres; for cassava 171.5 acres; for sesame 93 acres; and for sorghum 83 acres. Alternative crops like cow peas or pigeon peas are planted on 6.5 acres and 31.83 acres respectively. Vegetables, tomatoes, jack fruits and pineapples are cultivated on one to two acres respectively, but they are cultivated by less than one per cent of farmers sampled. As most of the crops are consumed by the families with surpluses being sold, local diets do not appear to be balanced, which could cause health problems. However, the planted crops are less perishable and are easier to store.

As noted above, none of the households keep large livestock. The manure produced by smaller animals such as goats and chickens is relatively small, so there is little to be discarded or processed. When asked which crops they apply manure to, two farmers said maize, one sorghum and one sesame. Apparently none of the households uses inorganic fertilizers, herbicides or pesticides on any crop. Only one farmer uses cassava as fodder for livestock. The residue of maize, sorghum, cassava and paddy are used by eight households to feed their animals. As the livestock numbers are very low in the project area and the grounds are fertile for grazing, the need for fodder production is low. The MICCA Programme could still promote the use of fodder production or the use of residues for small livestock holders and increased livestock production (e.g small-scale poultry farms).

The majority of farmers are able to sell agricultural products, such as harvested crops, as well as pigs, goats, chicken and eggs. Interview partners were asked to indicate the annual yields for each of crop. The given yields were measured in *Amboni* (20l buckets), *Ng'ondo* (4l buckets) and *Selina* (1l container) and later converted in kilograms⁷.

Table 8 shows the average yields for the principle crops, divided by project participants and non-participants.

Table 8. Annual yields for main crops

Statistics on annual yields in kg PROJECT PARTICIPANTS	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon peas	Cow peas
# valid	56	20	32	42	14	9	16	8
# missing	2	38	26	16	44	49	42	50
Mean	409.1	408.7	230.1	231.9	561.1	706.7	111.8	35.1
Median	212.8	192.0	123.5	180.0	320.0	600.0	77.4	36.6
Statistics on annual yields in kg NON PARTICIPANTS	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon peas	Cow peas
# valid	233	78	76	156	107	46	39	7
# missing	42	197	199	119	168	229	236	268
Mean	171.4	159.6	146.3	131.3	372.1	737.6	64.6	28.6
Median	121.6	112.0	95.0	90.0	288.0	300.0	34.4	12.2

It is worth noting that almost all median and mean yields for project participants are higher than for non-participants. For some crops (like paddy, bananas, pigeon peas and cow peas) the yields of project participants are up 100 percent higher. However, due to small sample sizes, these results

⁶ Paddy is the term used for rice in the project area and will be used as such in this study.

⁷ The exact conversions can be found in Annex C, based on density calculations.

<http://www.aqua-calc.com/page/density-table>

only represent an estimate and need to be treated cautiously. In future surveys, similar discrepancies between project participants and non-participants should become more clearly visible and indicate more diverse crop selection.

Generally, when accounting for the higher yields, the majority of project participants consider double digging and planting in rows the most beneficial techniques. Isolated practices that led to the higher yields cannot be identified from the sample. At this point, the discrepancy between HICAP participants and non-participants needs to be understood as a trend that will require closer observation during the project's implementation phase. In addition, project participants might have become more market orientated since joining the project and becoming part of VSLs and may have been more willing to invest in equipment or training. Nevertheless, even though the absolute numbers have to be treated with caution due to the small sample size, the differences in yields are still significant.

Differences in yields can be observed based on village location. When compared to other locations, Kolero had the highest yields in maize and paddy; cassava and pigeon peas bring medium yields. For Kassanga, paddy, cassava and banana brought the highest yields in comparison to other villages. In Balani, the yields are generally lower than for the other four villages, with maize and sorghum yields in the average range. Cassava and pigeon peas seem to grow very well in Kizagila, followed by maize and banana. In Mlagano, almost all yields from maize, sorghum, paddy, cassava and pigeon peas are high compared to other locations. Altitude, soil conditions and rainfall are the main factors affecting yield differences. In Mlagano about 40 percent of interviewees are project participants; in Kolero 16.7 percent. This may be an indication that the skills learned about CA are having an impact on yields. However, the situation needs more detailed analysis and monitoring.

When comparing annual revenue from sales of farm produce, the findings indicate a similar situation as with yields. Half of all project participants can make on average 178 000 TSH⁸ per year, whereas non-participants make 117 750 TSH per year (median) -- a difference of 33 percent. The sample average (median) is 133 500 TSH per year -- 25 percent less than the average revenue from project participants. Income is mainly generated by selling maize, sorghum, sesame, cassava and chicken.

When looking at the average annual revenue (median) made from sales of farm produce by location, Mlagano (196 000 TSH per year) and Kizagila (146 000 TSH per year) have the highest average figures, followed by Balani (136 250 TSH per year) and Kasanga (104 000). Surprisingly Kolero, which enjoys the best connections to markets and infrastructure, has the lowest revenue from the sale of farm produce with (median) 89 000 TSH per year. This could be explained by the fact that farmers in Kolero can grow more diverse crops and provide enough food for the family themselves. Consequently, unlike farmers in villages at higher altitude (e.g. Kizagila) who can only cultivate a limited amount of crops, Kolero farmers would not need to sell as much farm produce to buy other items. Another reason for this difference could be the quality and type of goods being sold. Maize and paddy is a common crop and may not bring in as much income as bananas and cassava, which are less cultivated in the overall sample. Selling livestock, such as pigs, may be another reason why revenues in the other locations are higher. Again, it is a small sample, and results need to be treated cautiously.

⁸ 1 USD = 1 758 TSH, October 2011

3.6 Tree planting

Currently, only 12.6 percent of all 333 interviewees plant or protect trees. Considering the wood requirements for energy and the common practice of slash and burn, which greatly diminishes reduces the number of trees, this low percentage is not satisfactory.

Nevertheless, it is promising to see that some of the 42 households who planted trees, planted more than just one type of tree:

Table 9. All planted trees

All planted trees	Frequency	Valid Percent
Indigenous Tree	30	51.7
Mango tree (<i>Mangifera indica</i>)	4	6.9
Coconut tree (<i>Cocos nucifera</i>)	4	6.9
Orange tree (<i>Citrus sinensis</i>)	4	6.9
Jack fruits (<i>Artocarpus heterophyllus</i>)	4	6.9
Oil palm (<i>Elaeis guineense</i>)	2	3.4
Pine tree (<i>Pinus</i> sp.)	1	1.7
Mahogany (<i>Swietenia</i> sp.)	9	15.5
Total	58	100.0

The term 'indigenous trees' in the table include Misedelea (*Cedrela odorata*, 55.2 percent), Mkangazi (*Khaya anthotheca*, 17.2 percent), Misimbulanga (scientific name uncertain, 10.3 percent), Msonobari (*Cedrela odorata*, 6.9 percent), Mibiriti (*Senna seamea*, 3.4 percent), Mwiza (*Bridelia micrantha*, 3.4 percent), and Mitalawanda (*Markhamia zanzibarica*, 3.4 percent). It would be worthwhile for HICAP and the MICCA Programme to research these particular species to determine if they are suitable for the area, are climate-smart and can be used for food or fodder.

Thirty-eight interviewees could recall the actual number of planted trees per type. Overall, 1 174 trees were planted, with an average of 30 (median 10.5) trees per interviewee, and a minimum of one and a maximum of 300 trees. The median value gives a more realistic picture as only 3 interviewees planted more than 50 trees. About three-quarters of all trees were planted on the farmer's own land, and about 15 percent on communal land.

Fourteen interviewees reported having protected trees in the last 12 months, but only six could give exact numbers. On average 19 trees (median 14) and overall 114 trees were protected by those interviewees; all of them on their own land. 'Protecting trees' was defined by the team as deliberately not cutting and using trees for fire wood or construction, and hindering others from doing so. Protecting trees does not involve nursing and maintaining newly planted trees.

The data point that only 12.6 percent of all households planting or protecting trees is very low in terms of climate change mitigation. Raising awareness about deforestation, reforestation and its impact should be key activities of HICAP and the MICCA Programme. Knowledge about the required tools and practices (planting and maintaining trees, establishing nurseries, etc) could be implemented through FFS, schools or general community awareness activities.

Combining CA and agroforestry is one of the main objectives of MICCA Programme/HICAP cooperation, and possible activities should be elaborated with other project components.

3.7 Conservation Agriculture (CA)

About three-quarters of interviewed farmers know the term ‘conservation agriculture’ (*Kilimo Hifadhi* in Swahili). It is the term used by HICAP,

‘...whose overall goal is to sustain and enhance livelihoods through improved family food security, better resource conservation, and gender sensitive support services. This is done through the use of conservation agriculture (CA) practices that are culturally and environmentally sound. Within this unique, fragile and underserved ecosystem, HICAP promotes minimum tillage, cover cropping (i.e. using leguminous crops), crop rotation/association, and permanent organic soil cover. This goes hand in hand with soil and water conservation techniques on the steep slopes and crop diversification’ (Coll Besa et al. 2011).

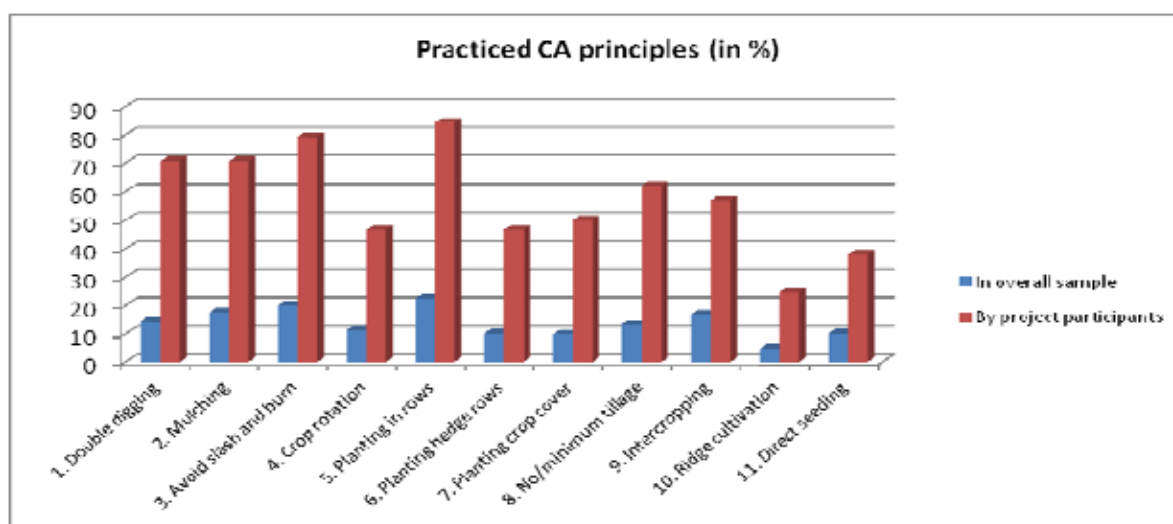
3.7.1 CA practices

There are many descriptions of CA given by interview partners. The most common are planting in rows (25.5 percent), conserving the environment (17.3 percent) and double digging (15.3 percent). Some also mentioned avoiding slash and burn, modern farming, intercropping and good farming practices. The descriptions are vague, ranging from general terms, such as improved practices, to single specific techniques like double digging.

Focus group discussions also revealed that farmers would say they know what CA is and claim to practice it without actually being aware of CA’s main principles. Often farmers ‘know’ CA practices from what they see on FFS demo plots, but they are not fully aware of the actual techniques and its overall benefits.

Even if they did not know the term ‘conservation agriculture’ or claimed not to practice CA, interviewees were asked to describe their farming techniques. Farmers may be practicing certain CA techniques without knowing it.

Graph 3. Practiced CA principles (in %)



Graph 3 shows that the most prevalent CA practices used by farmers are planting in rows (22.5 percent) and avoiding slash and burn (20.1 percent). All other techniques are implemented by less than 20 percent of the sample. Mulching (17.7 percent), intercropping (16.8 percent) and double digging (14.1 percent) are the other most common CA practices.

For project participants, planting in rows (84.5 percent), avoiding slash and burn (79.3 percent), double digging (70.7 percent), mulching (70.7 percent) and no or minimum tillage (62.1 percent) were the most commonly practiced techniques. Intercropping (56.9 percent), planting crop cover (50 percent) and crop rotation (46.6 percent) are done by around half of the participants. Although the number of project participants (58) is rather small, it is clear that the frequency of CA techniques

practiced among project participants is higher than for the overall sample. This can be seen as a measure of the HICAP's success to date.

Out of 333 cases, 89 farmers said they practiced at least one of the listed CA techniques. The mean value is 5.6 and the median six techniques per interviewee. For those 58 interviewees who identified themselves as project participants, the average number of CA techniques is 6.8 (median 7) -- slightly higher than for the overall sample.

Thirty-five of the interviewees practice CA techniques, but did not consider themselves project participants -- more than 10 percent of the overall sample. Some are just practicing one technique, others up to ten, with an average of 3 (median) CA techniques.

In line with the high prevalence of these practices, planting in rows (25.4 percent), double digging (23.2 percent) and mulching (15.5 percent) are considered by all interviewees as the most beneficial practices for increasing productivity. Even though intercropping was said to be practiced by a number of interviewees, it was not seen as beneficial to agricultural productivity. Only isolated cases saw the benefit of direct seeding, ridge cultivation, planting hedge rows and crop rotation. It would be advisable for future interventions by HICAP and the MICCA Programme to clearly show the benefits of planting single crops in some situations (revenue, use for household consumption, selling, etc) as well as the benefits of intercropping certain type of crops.

According to CARE and HICAP, a 'CA adopter' is a farmer who follows the three key CA principles: (i) minimum soil disturbance or no till, (ii) permanent organic soil cover (like mulch, crop residue or cover crops) or (iii) diversification of crop species grown in rotation. HICAP collects data regularly on adopters through contact farmers who provide information from within their village. It is an inherently subjective evaluation.

Based on this definition, 22 cases (6.6 percent) in the sample can be considered adopters. All except one are project participants. Table 10 shows farmers who are following CA principles. It is clear that farmers do not follow a single CA principle but rather use them in combination.

Table 10. Number of CA principles

Number of CA principles		Frequency	Valid Percent (overall sample)
3	1. no/minimum tillage	22	6.6
	2. mulching		
	3. crop rotation		
3	1. no/minimum tillage	19 ⁹	5.7
	2. crop cover		
	3. crop rotation		
2	1. no/minimum tillage	25	7.5
	2. crop rotation		
2	1. mulching	31	9.3
	2. crop rotation		
2	1. crop cover	20	6
	2. crop rotation		
2	1. no/minimum tillage	39	11.7
	2. mulching		
2	1. no/minimum tillage	29	8.7
	2. crop cover		

⁹ These are the same cases that are also using mulching.

Out of all interviewees, from 6 to 11.7 percent are following at least two CA principles.

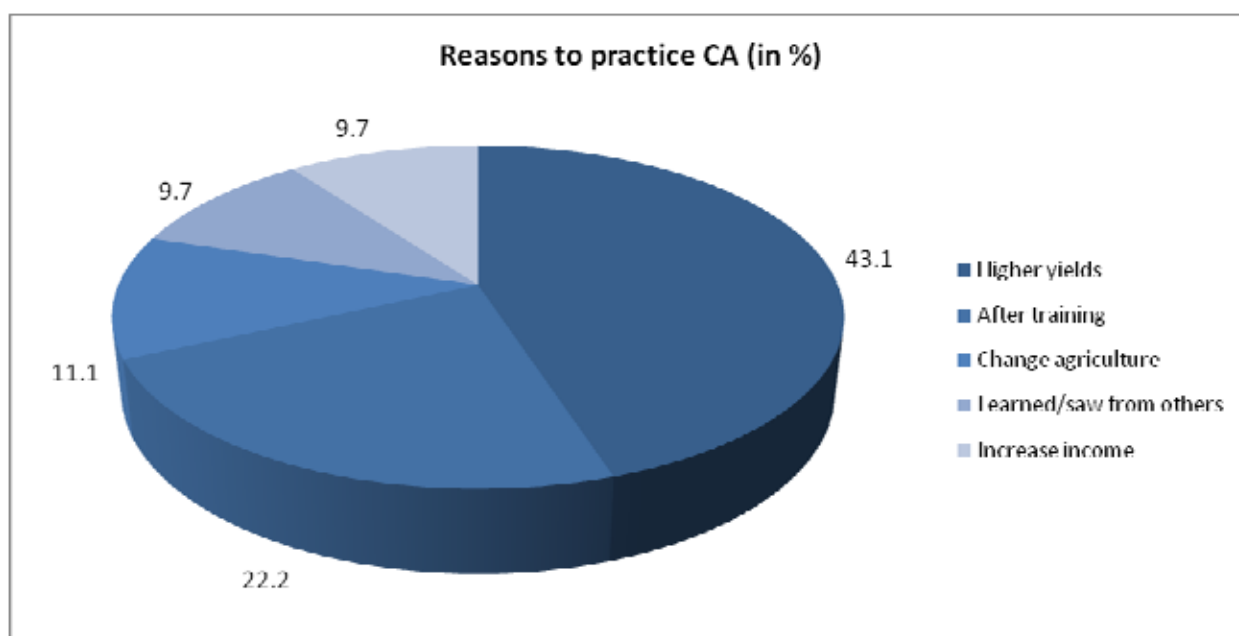
The number of adopters should increase over the course of the HICAP project cycle and MICCA Programme/HICAP cooperation. The definition of the term ‘adopter’ and its key principles may need to be revised if the MICCA Programme adds a climate change related component. A further indicator for adopters could be the willingness to plant and protect trees or avoid slash and burn.

3.7.2 Reasons for practicing CA

In cases where CA practices are implemented, the decisions have been made by men 41.9 percent of the time, by women 32.4 percent of the time and by both men and women 23 percent of the time. In focus group discussions, it was revealed that the decision-making process depends on the respective household. Sometimes grown-up children are the ones most willing to adopt CA and persuade their parents to do so.

The main reasons for adopting CA techniques are illustrated in graph 4:

Graph 4. Reason for practicing CA (in %)



The main motivating factor for adopting CA is the expectation of higher yields (43.1 percent) and higher incomes (9.7 percent) leading to better livelihoods. About one-quarter of the interviewees decided to adjust their agricultural practices after attending a training session. Almost 10 percent decided to do so after seeing the successes of others farmers.

As stated above, about 10 percent of the sample is practicing CA techniques, even though they are not project participants. This is a success for HICAP and its approach of working with FFS and multipliers (like contact farmers, community-based trainers and extension workers) in the villages. It was mentioned several times in focus group discussions that people in the area learned by seeing the successes their neighbors and other farmers in the village have had with the new practices and tools. Farmers would also first ‘test’ the practices to see if it paid off. In one of the villages, farmers conducted an experiment comparing the yields of two plots, one cultivated with CA and one without CA. After seeing the results, the farmers were encouraged to start using CA on their own plots and received the required help from contact farmers and extension workers. It is important for the MICCA Programme to consider these success stories when developing a possible action plan that focuses on village farmers and not just project participants. Additional demonstration plots in all hamlets would be an ideal opportunity to support ‘learning by seeing’.

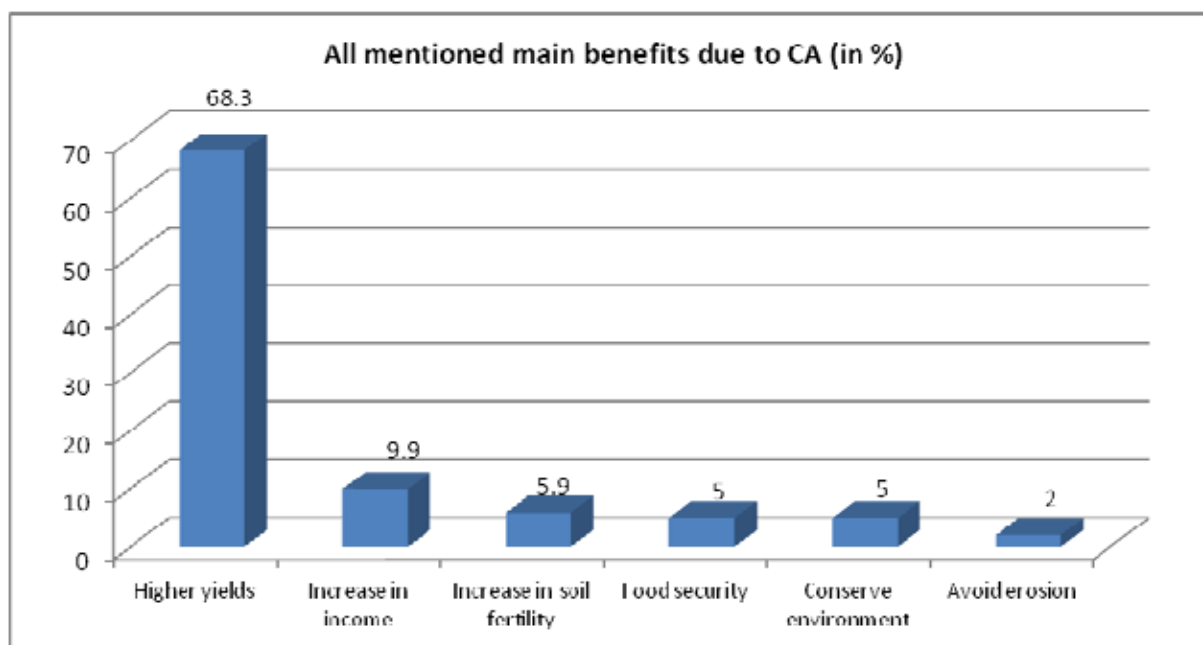
3.7.3 Investment and current costs due to CA

The 79 households practicing CA were asked about initial and ongoing costs brought about by the changes in their farming practices. Less than 20 percent of these farmers said they had to make an initial cash investment. One respondent required additional labor. Unfortunately, the respondents did not specify the nature of their additional expenditures, which range from 10 000 TSH to 150 000 TSH for an average of 60 769 TSH (median 50 000 TSH). Half the farmers practicing CA said they had ongoing costs related to CA. The majority have regular labour costs (median 22 000 TSH annually) and also have to buy and maintain equipment (median 100 000 TSH annually), with an overall average amount of 25 000 TSH per year.

3.7.4 Benefits and disadvantages from using CA

After considering additional costs and initial investments, the majority of farmers practicing CA see more benefits than disadvantages. The main benefits (see graph 5) are seen in higher yields, which leads to more surplus and consequently to potential increases in income and food security.

Graph 5. All mentioned main benefits of CA (in %)



It is heartening to see that farmers are aware of the environmental benefits of CA. This is evidenced by the fact that increasing soil fertility, conserving the environment and avoiding erosion are given as responses about the main benefits of CA. The opportunity to build on the existing awareness and knowledge of environmental degradation is a noteworthy entry point for HICAP and the MICCA Programme.

In one focus group discussion with adopters, a person said: “In CA, you can save time because at first, you start with double digging (it takes more time), but after that you do not use much time in the farm. In CA, you remove the weeds once, and then you may even wait up to harvesting period”. Another interviewee summarized the benefits by noting that limited energy is needed when using CA while production increases, whereas in traditional agriculture it is the opposite. Also, when using CA, labour costs drop because only a limited area is cultivated compared to traditional agriculture. Several focus group discussions emphasized the benefit of being able to produce high yields on a relatively small plot when using CA. One farmer reported that he could feed his family all year round by cultivating his two acres land. Another farmer supported this claim, saying that after adopting CA, he can now provide his family with three meals per day.

Only 20 cases noted possible disadvantages of CA, noting that it is too time-consuming, requires increased expenditures, brings no immediate visible profit and produces unsatisfactory yields. In addition, single interviewees also mentioned that keeping crop cover, leaves and residue on the fields attract animals that destroy crops. More than half of this small group are not a project participants, although all practice some kind of CA. Farmers also shared the view that more time is needed in the beginning for double digging the soil and breaking the hardpan, which can be difficult work. However, ongoing costs would be less and therefore worth the effort. In focus groups, farmers mentioned that, even when using CA, the general problem of lack of markets access still remains.

3.7.5 Additional income from CA

More than two-thirds of households practicing CA saw an increase in their income due to CA over the last 12 months. The additional income was predominantly generated by higher yields from maize, sesame, paddy, sorghum and pigeon peas. The exact weight or volumes of those additional yields is not stated in the questionnaires. Only half the interviewees gave monetary values for the additional income. Nevertheless, the remaining 47 cases were able to make 141 047 TSH (90000 TSH median) more in the last 12 months, with a minimum of 5 000 TSH and a maximum of 800 000 TSH. Although this is a very small group, it is clear that the aforementioned required investment for CA (on average 60 769 TSH) and ongoing costs per year (25 000 TSH) could be covered quite quickly by the extra income gained from adopting CA. Again, such calculations need to be treated carefully. These figures could be due to coincidence rather than to a causal relationship. In future surveys, the possibility of covering CA investment costs through additional income derived from CA should be monitored and evaluated.

In addition, about one-quarter of farmers practicing CA were able to start their own business over the last 12 months due to the additional income derived from adopting CA.

Table 11. Type of business started in last 12 months

Type of business started in last 12 months	Frequency	Percent	Valid Percent
Restaurant/cooking	5	1.5	25.0
Selling crops	7	2.1	35.0
Petty trade	3	.9	15.0
Shop	3	.9	15.0
Selling baskets	1	.3	5.0
Selling local brew	1	.3	5.0
Total	20	6.0	100.0

Table 11 shows that most businesses are based on selling or processing crops (cooking, local brewing) and present new income generating opportunities for farmers. Although the farmers practicing CA are a relatively small group in the sample, the findings infer that they have been successful in improving their agricultural production and can increase their income substantially. HICAP and the MICCA Programme should use this information in future interventions and communicate the potential of CA (especially its financial benefits) when working with the communities. In focus group discussions, participants report that, after returning from training sessions without being paid, it is difficult to 'defend' themselves in front of neighbors who are not participants of the project. Training and capacity development is not considered valuable among the population. For this reason, project interventions need to emphasize the correlation between training and possible initial investments in CA with the long-term benefits it brings. Such messages need to be communicated in villages and to project participants to strengthen their role as successful multipliers.

3.7.6 Further support for CA practitioners

In focus group discussions, farmers identified areas where they would need continued support from the project.

A number of groups ask for more training on CA, indicating that the training they have received so far was not sufficient. Others would also like to learn more about tree planting, nursery preparation and irrigation techniques (like rainwater harvesting and water catchment protection). Other requests from farmers included the provision of livestock and information about raising livestock and animal health. Also, farmers see a need for the free distribution of more implements and inputs (e.g. improved hoes, irrigation pumps, seeds, certain types of livestock).

Farmers indicated that they want a more detailed understanding of CA to be better able to advise fellow farmers. They requested more demonstration plots in each hamlet as means of persuading others to practice CA as well. Training should be provided not by foreigners or visitors from other villages, but by persons from within the village as their advice will be accepted by all inhabitants. In some villages, farmer groups are not satisfied with their contact farmer who is often overwhelmed by the work load. The farmer groups believe the contact farmers need to be trained more intensively to be able to work with experienced farmers.

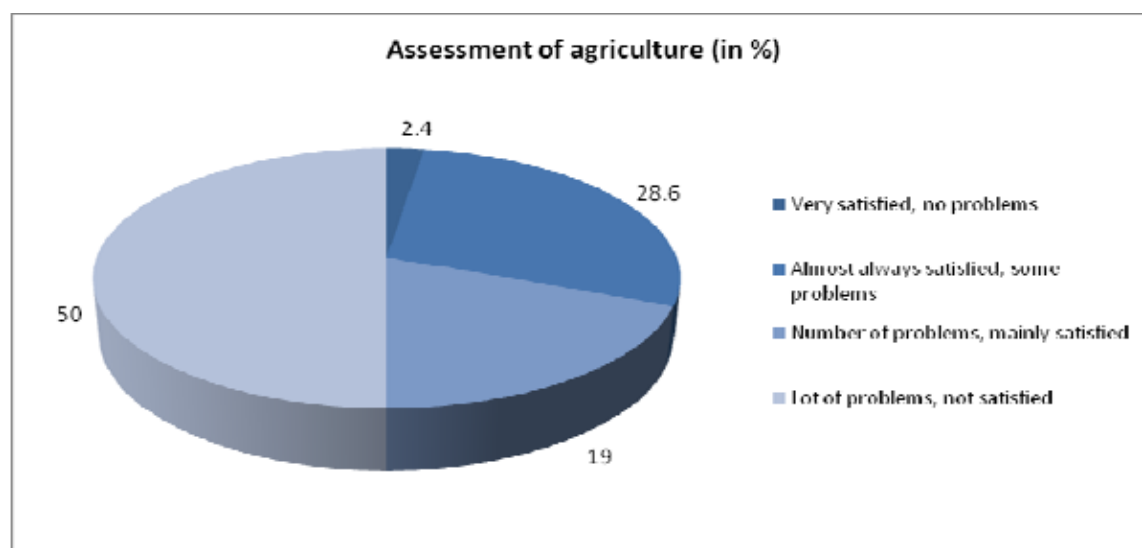
In one group, participants asked to learn more about the MICCA Programme and climate change. They would appreciate awareness campaigns about the link between climate and agriculture and how to adapt to the current rainfall patterns.

HICAP and the MICCA Programme should take those requests seriously when planning future interventions. Farmer groups are convinced that CA practices do work for them, but they see a need for further support from the project to be more successful. The idea of strengthening multipliers in the village (contact farmers, teachers, school children) had been suggested at an earlier stage and would be welcomed by the existing CA practitioners. In addition, some sort of refresher training sessions with existing groups may be a good entry point for the MICCA Programme to distribute messages on climate change and agroforestry.

3.7.7 Farmers not practicing CA

Interviewees who are not practicing CA were asked to evaluate their current agricultural situation. This would serve as an indication of current levels of satisfaction with their farm production and whether or not they see a need to change their farming practices.

Graph 6. Assessment of agriculture (in %)



Graph 6 however shows that half the farmers have many problems and are not satisfied with their current situation. This group could be potential project participants and become interested in CA. The others are either very satisfied and has no problems; are almost always satisfied but face some problems; or have a number of problems but are mainly satisfied. This second group may not be very interested in adjusting their practices to improve the agricultural performance.

For the entire group of non-practitioners, the main agricultural problems are low yields (30.6 percent), diseases (20.8 percent), lack of equipment (7.5 percent), lack or unpredictable rainfall (12.3 percent) and prolonged dry season (7.3 percent). HICAP and the MICCA Programme could address the two latter problems by promoting training and capacity development as means to adapt to changing weather and rain patterns. In focus group discussions, project participants and non-participants said they required more training about how to adapt to lower rainfalls and general changes in weather. As CA is one possible adaptive strategy, along with diversity in crop selection, HICAP and the MICCA Programme could emphasize this function of CA more explicitly when raising awareness and mobilizing potential new project participants.

Less than half of the 252 cases have heard of CA. The majority could not provide an explanation of what CA is. Table 12 shows the reasons why farmers did not join the project or practice CA.

Table 12. All reasons for not joining the project

All reasons for not joining the project	Frequency	Valid Percent
High costs	4	1.8
Lack of training (CA)	83	38.1
Lack of knowledge about project	81	37.2
Difficult to practice/adopt	5	2.3
Lack of finances	3	1.4
Lack of enough labor	19	8.7
Lack of motivation	1	.5
Lack of time	12	5.5
Lack of land	6	2.8
No need	1	.5
Used to other techniques	3	1.4
Total	218	100.0

About three-quarters replied that they did not know about the project or did not receive training in CA. These factors can be addressed by HICAP and the MICCA Programme easily, as it requires 'only' a greater presence and more activities in the area (especially remote areas) rather than extensive changes in behaviour. Insufficient labour (8.7 percent) and lack of time (5.5 percent) are views that can be clarified by the project when discussing the actual time and labour inputs required. Ideas about the additional costs, time and inputs may have been based on hearsay rather than on actual facts.

Most of the reasons given for not joining the project can be addressed by awareness raising or training activities. Difficulties in adopting CA can be overcome by describing the success stories of CA practitioners. The misconception that CA requires investments and more money can be clarified by a simple cost-benefit calculation showing the potential for higher yields and surpluses.

In focus groups discussions, the majority of non-practitioners said they needed to see that CA works before making any investment and choosing new techniques. Stories were shared by farmers who had started to use it recently and could already see potentially higher yields. Farmers also said that the number of contact farmers is not sufficient to cover all hamlets. More demonstration plots would

help other farmers see the potential benefits of CA. Others mentioned that the selection process by which HICAP identified possible contact farmers and project participants did not seem independent and fair¹⁰. Any future messages and strategies carried out by HICAP and the MICCA Programme need to be communicated in a very clear and transparent manner that does not focus solely on project participants, but rather employs community-based activities that reach a broader audience.

It has been learned through field activities and HICAP's experience that the population is very hesitant to deal with foreigners and outsiders. They are often viewed as 'bloodsuckers', which can make cooperation with the local population difficult. It is good to see that none of reasons given for not joining the project or using CA was explained by negative views of outsiders. However, in focus groups discussions, mistrust was sometimes given as a reason for not taking part in HICAP's initiatives. The reasons for this mistrust were not explained by interview partners, which make it very difficult to tackle the problem. Others did not join because they did not see the point of attending meetings without getting anything in return – not even tea. People are cautious and not very trusting, as they do not understand why the HICAP team would come such a long way just to talk about agriculture. Especially when 'mzungus' (foreigners) come, farmers may feel even more uncomfortable because they do not fully understand their motivations. Further research by HICAP might provide a better understanding about why and foreigners and outsiders are sometimes viewed as 'bloodsuckers' and offer insights on how to best deal with such misconceptions. Again, an emphasis on more transparent communications with villagers and working with local multipliers in the villages would be a possible first step toward overcoming such mistrust.

Table 13 gives details on the activities and inputs that HICAP would need to provide that non-CA practitioners would need to be willing to join the project.

Table 13. Requirements to join the project

Requirements to join project	1. More training		2. Lower costs of initial investment		3. Less maintenance costs		4. More labour force		5. More equipment		6. See good examples		7. More immediate benefit/revenue		8. More assistance from a project	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	234	93.6	131	52.2	66	26.3	111	44.6	133	53.0	131	52.2	71	28.3	136	54.2
No	16	6.4	120	47.8	185	73.7	138	55.4	118	47.0	120	47.8	180	71.7	115	45.8
Total	250	100	251	100	251	100	249	100	251	100	251	100	251	100	251	100

The majority of non-practitioners would require more training and assistance from the project (especially from contact farmers), more equipment (including irrigation equipment and inputs, such as fertilizers and improved seeds), more demonstrations of good examples to follow and lower initial costs. In focus groups, farmers mentioned that they would need to see more success stories and see the clear benefits of CA before joining a FFS group. HICAP can address most of these issues by organizing awareness raising activities that provide clear messages about the costs and benefits of CA, offering technical training or encouraging current project participants to share their success stories. Farmers suggested that building the capacities of local leaders and multipliers in the village would help to raise the level of awareness. As mentioned earlier, the belief that outsiders are 'bloodsuckers' needs to be investigated more deeply and adequate strategies to overcome this misconception developed.

¹⁰ Comments like this have to be treated carefully. Farmers, non-participating, might want to justify their decision not to join retrospectively by accusing/blaming HICAP for a not transparent selection process, after seeing participants benefiting from the project than admitting they were/are not interested in the project.

Within the sample group, there was a general willingness to make monetary investments to improve their agricultural performance and produce higher yields. Non-adopters would be willing to invest 30 744 TSH (median 20 000 TSH). According to the 20 percent of CA-practitioners that had initial investments, this is about half the amount required when starting CA. However, these figures need to be treated carefully, as only a very small group provided details about their actual expenditures. To avoid rumors about prices and costs, HICAP could develop a price sheet or table calculating actual cost increases when starting CA that could be used for future training and awareness campaigns.

Half of the CA-practitioners said they needed to work one and a half hours more per day (10.5 h per week) in the field since adopting CA. Non-practitioners would be willing to invest on average 9.9 h per week (median 6 h). These findings indicate that the additional required amount of time and the amount farmers would be willing to invest are similar. The same willingness could be observed in statements made in focus group discussions.

In summary, possible entry points for the MICCA Programme to work with currently non CA-practitioners could be through interventions that emphasize the positive impact CA would have on farmers ability to adapt to climate variability and contribute to climate change mitigation through reforestation. The Programme needs to communicate clearly the additional costs, the required investments, the additional labour and time needed to adopt CA to deal with misleading rumors. Based on the present findings, lack of knowledge about the project and CA techniques are the main reasons farmers are not adapting CA or joining the project. Cultural beliefs or general resistance are not the main factors.

Before entering in workshops and trainings with farmers in villages, HICAP and the MICCA Programme might need to reconsider the current approach of contacting new farmer groups and perhaps intensify awareness raising activities with specific multipliers, like local leaders, church groups or teachers.

3.8 Markets, labour and food security

3.8.1 Access to markets

The project area is located far from regional markets. Kolero is the most central trading point. Villages have weekly markets, and farmers travel long distances on a regular basis to sell their goods or buy supplies. Kolero is the most visited market (by 32.4 percent of interviewees). Other popular markets are in Mvuha (21.5 percent), which is about 40 km/90 km by road from Kolero, depending on the route and Dutumi (9.6 percent), which is approximately 30 km from Kolero. Vendors also sell at their own village market or at their homestead (26.2 percent).



Picture 2. Market day in Kolero

Out of the sampled households, 307 sell their goods at least at one market, 169 at two markets, 52 at three, and three farmers at as many as four markets. The majority either sell several goods at one market or just one specific item, depending on the market and the produce for sale. Most markets are visited either on a monthly basis (27.1 percent) or twice a year (25.9 percent). The latter markets, located further away, are where specific goods, such as animals, are sold. A further 16.8 percent of

the vendors visit a market once a week where they sell the same goods as at other markets: maize, sorghum, sesame, bananas, vegetables, pigs and eggs etc.

About half of the vendors travel between 4.5 km and 22.8 km from their homestead to one of the markets (a median distance of 14 km of all markets). It must be noted that these figures are not precise as villagers often do not know the actual distance in km. For this reason, half of the sample gave their answers in the time required to reach the markets. On average, farmers needed to travel four hours to get to the market (mean 158 h). For some it takes a very long time (maximum 360 h) because almost all travelling to markets is done on foot. Only 1.2 percent use a bicycle. Two farmers pay a middleman (1500 TSH and 6000 TSH respectively) to take their goods to the market (also by foot).



The distance to markets and the transported goods could be elaborated in more detail but this is not the purpose of this report. The following three points can summarize this report's findings in this area: the majority of farmers sell their surplus of crops on a regular basis; they need to walk up to 14 km on average to the next market; and there seems to be no difference in goods sold at the respective markets.

In the future, the market situation in the project area should change as HICAP is planning to build a market in Kolero. In this setting, vending could be done in a more controlled, safe and dry environment. As a result, Kolero may become even more of a focal point for vendors from other villages.

Picture 3. Tomato seller at market

3.8.2 Required on-farm labour

Less than 20 percent of all interviewees hired female staff as casual labour in the last twelve months. On average, five person-days per year were paid to female staff. Their tasks included tillage (49.2 percent), weeding (39.3 percent), double digging, slashing and cultivating (3.3 percent respectively). Neither women nor men were hired as permanent staff. Less than 15 percent of all farmers hired male casual laborer for tilling (59.2 percent), weeding (16.3 percent) and slashing (14.3 percent). Other tasks included preparing the farm, double digging and harvesting (around 2 percent respectively). On average 5.7 person-days were paid by the farmers for male casual laborer. This, along with the findings for female labour, constitutes a rather small number in the sample. It is good to see that only one household hired girls less than 14 years old for three person-days for weeding and cultivating. Only one household hired boys less than 14 years old for slashing for four person-days.

According to interviewees, 2 000 TSH per day are paid for casual labour, This incurs additional costs of 10 000 TSH (for a female labourer) and 11 400 TSH (for a male labourer). Permanent staff would cost about 150 000 TSH per month. Farmers do not see this as necessary, nor can they afford it.

Besides weeding, the main tasks given to casual laborers are slashing and tillage, both of which are not climate-smart agricultural practices. It would be good if future finding show that farm tasks carried out by hired staff had become more climate-smart.

Participants in focus group discussions noted that, in general, labour roles are divided according to gender. Women are responsible for fetching water, preparing food, cleaning the house, collecting firewood, washing clothes, milling and taking care of children. Women carry out these task in addition to working in the field, slashing, weeding, tilling and harvesting. Men are responsible for processing the fire wood, building houses, visiting markets, planting and cultivating the land. According to one woman in a focus group in Kasanga the men also "wait for food to be ready, play with children and drink alcohol". Children help sow seeds, collect firewood or make charcoal and herd livestock.

This division of labour should be considered over the course of the project and during training activities.

3.8.3 Food security

Over 30 percent of all interview partners say they are able to provide food for their families all year. About 60 percent are able to do so for part of the year. Table 14 below shows the number of months farmers are able to provide food from their own production for their household.

Table 14. Months able to provide food

Months able to provide food	Frequency	Percent	Valid Percent
1-3 months per year	31	9.3	9.4
Up to 6 months per year	105	31.5	31.9
Up to 9 months per year	57	17.1	17.3
The whole year	103	30.9	31.3
Even more than a year	6	1.8	1.8
Could not provide food for their family	6	1.8	1.8
Very irregular	21	6.3	6.4
Total	329	98.8	100.0

One-third of the sample is able to supply their family with food for up to six months of the year and another third up to a whole year. Fewer respondents said that they could provide food for less than three months or up to nine months. This pattern applies to all villages except Kasanga, where a larger number of respondents can supply food for their families for only three months or nine months. Family size does not seem to play a role.

It is reassuring to see that only a few isolated cases cannot provide food at all for their families (6 cases, 1.8 percent) or for less than three months (31 cases, 9.4 percent) with their own farm output. HICAP and the MICCA Programme would like to see the latter figure decrease even further as a result of their initiatives.

3.9 Climate change

Interviewees were asked if they had heard of the term 'climate change'. Surprisingly, 72.3 percent of the sample had heard of it and responded to questions about the impact it is having on their lives and their strategies for preparing and adapting to it.

3.9.1 Awareness and experience with climate change

The most common explanations of climate change are prolonged dry season (27.7 percent) and changes in rainy season (12.1 percent). The latter indicates that the beginning and ending of rainy season have changed making rain cycles unpredictable. Less rain in the rainy season was also mentioned as an explanation by 14 percent of the sample, as well as higher temperatures (12.5 percent). All these statements simply describe changes in rain patterns. They are not explanations,

but rather observations. Other responses included longer and dryer dry seasons and more rain, and even flooding, in the rainy seasons. These answers show that perceptions of rain patterns have changed and that patterns have become unpredictable.

Farmers who had not yet heard of climate change also mentioned less rain in rainy season (22.9 percent), prolonged dry season and changes in rainy season (each 16.7 percent). When considering the total sample, the most commonly stated observations were: the dry season is much longer (44.2 percent); there is less rainfall (39 percent); there is more rainfall (6.5 percent) and flooding is more frequent (2.6 percent).

These statements are supported by findings from focus group discussions. According to these discussions, in the past, Mvuli (the short rain season) started in October (others saying early as July) and lasted up to February or December. In March, the Masika rainy season would begin and last until May or June bringing sufficient rain. Recently, there has been little rain during Mvuli. Rains start later, are more intermittent, bring less precipitation and do not last as long. The rainy season is generally shorter than in the past and starts later.

Some of the interview partners say that nowadays there is no pattern to the rainfall at all. In the high altitudes, farmers need to plant during Mvuli, but they are not producing sufficient yields due to insufficient rains. They cannot plant during the Masika period as the heavy rains cause soil erosion and destroy crops.

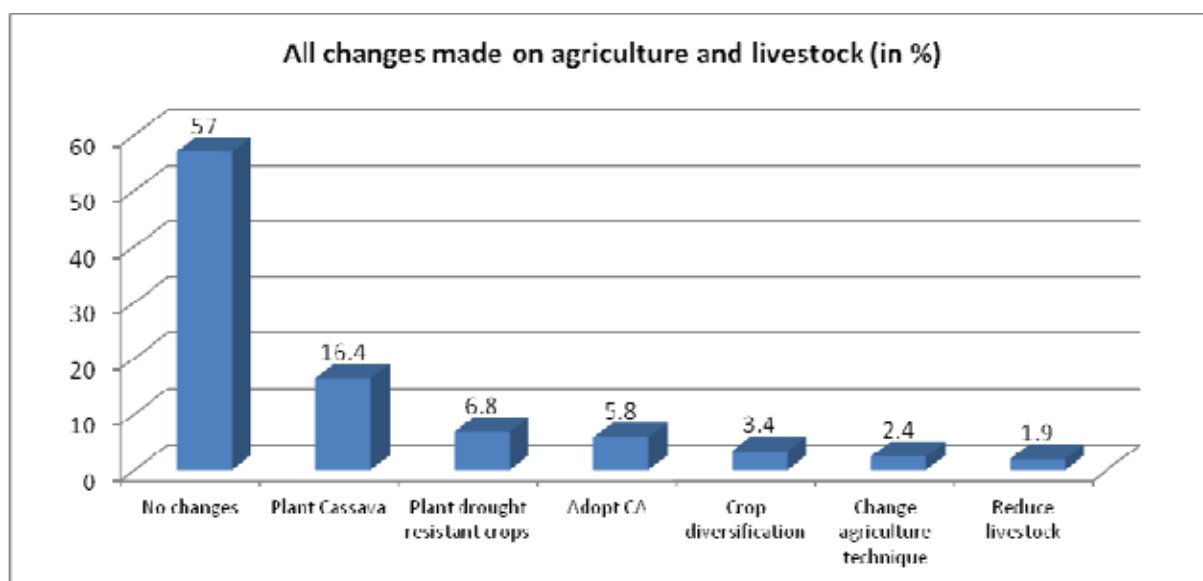
One participant in a focus group noted that, in the past, the rain was sufficient even when using traditional agricultural techniques. They were able to harvest three to four times a year as Mvuli would smoothly go into Masika, providing enough rain. Farmers would plant in December and January, harvest in May; plant in May and June again and harvest in September or October; plant in September or October and harvest in January. Now they can only rely on Masika rains from March onwards and have to cope with longer dry spells. Another interviewee summarizes the situation by saying the amount of rain is an issue, but the unpredictable timing is an even bigger obstacle.

For three-quarters of the sample, these changes lead to food shortages (73.6 percent), increases in diseases like pneumonia and flu (6.7 percent) and lack of safe water (5.5 percent - the main water resources are wells which need to be recharged by rain water). In regard to agriculture, these changes result in crops drying up (46.1 percent) and being destroyed (12 percent), which results in lower yields (31.0 percent). Another consequence of less rainfall is an increase in livestock deaths (11.3 percent) due to diseases, heat and lack of water. This also leads to food shortages and less income. In a focus group discussion, one farmer stated that due to climate change there is less money to pay for children's education. Sudden and heavy rains and flooding destroy houses and livelihoods of families. In addition, pasture land becomes eroded, increasing the pressure on grazing land and limiting the number of livestock.

3.9.2 Adaptation and Preparedness to climate change

When asked what is currently done to adapt to such changes in weather patterns, slightly more than half of interviewees replied that they had not made any changes. This is a noticeable number given that a fairly large group had identified possible risks due to changes in the weather.

Graph 7. All changes made on agriculture and livestock (in %)



Graph 7 lists the changes made in response to climate variability. Farmers (16.4 percent) said they had planted cassava as it is considered drought-resistant and can be used to feed the family. Another seven percent had also chosen to cultivate more drought resistant crops. Almost six percent said they to use CA as a way to adopt to changes in weather patterns. Others said they had changed their farming techniques and diversified their crop production.

Asking about what farmers plan to change in the future, the answers are similar to those in graph 7. In addition, single respondents said they would start planting or harvesting earlier, open their own business, plant more trees and improve their food and fodder storage.

More positive statements could be found among focus groups. Participants in Balani were very eager to share their experience in restricting people from burning forests. The group realizes that burning degrades the environment and has tried to communicate this to other farmers. In Lubasazi, farmer groups have also restricted the cutting down of forests as the forests bring rain. One of the participants summarized their position as ‘...where there are forests, you will find more rain’.

Others emphasized that CA helps them to plant all year around and even in dry periods as more water for crops can be stored in the soil. Over the course of several years, the soil becomes more fertile, leading to larger harvests. As a result, other adjustments are not required to adapt to changing conditions.

HICAP and the MICCA Programme should focus on the large group in the sample who have not made any adjustments to their farming practices and are not planning to change anything in the future. Responses to other survey questions suggest that these farmers may lack the knowledge and farming techniques needed to adapt to weather and climate variability and would require more training and support from the project. Key messages should outline realistic adaptive strategies. Focus groups also indicated that the project would need to communicate to villagers about how to mitigate climate change and how CA could contribute to this effort.

In the future, local farmers will need to have a greater understanding about climate change and their potential role in climate change mitigation. Intensive community meetings, school activities and training of key multipliers in the village could be possible contributions provided by the MICCA Programme.

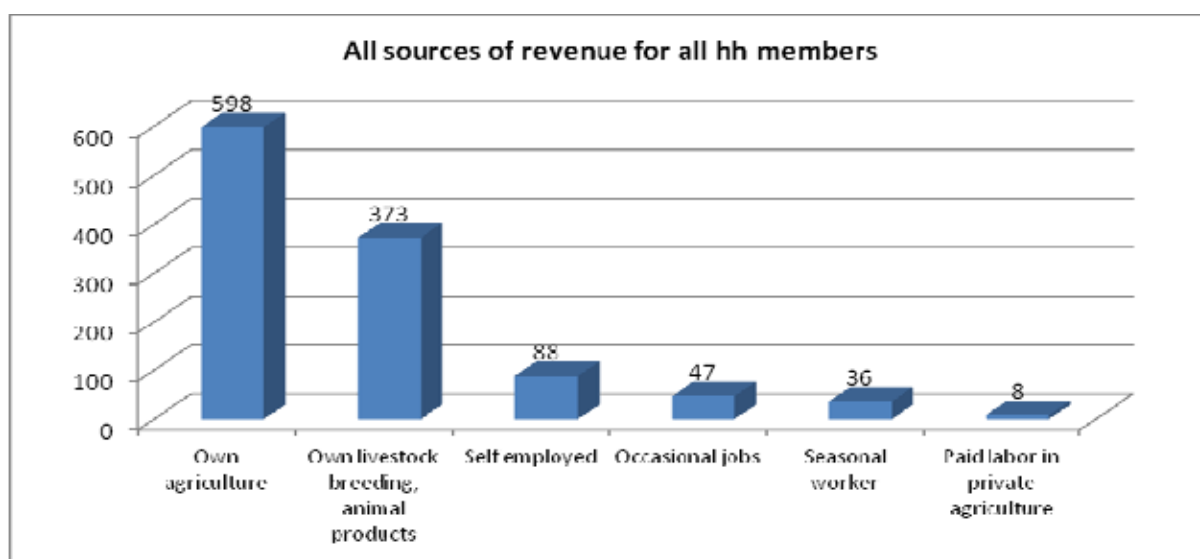
3.10 Household economics

This section looks at the different sources of household revenues and the actual incomes obtained. It also assesses the respondents' overall economic situation. The term 'household' was defined as all people living in the house, whether they contributed to the household income or not. It included members who depend (financially) on the household, such as children in boarding schools and members of the extended family who have nowhere else to stay. Persons and relatives who live further away (in Tanzanian cities or abroad) who do not depend on the household were not considered as members. Remittances from relatives and migrants have been considered and are presented later in this chapter.

3.10.1 Sources of revenues and household income

Interviewees were asked to state the source of revenue for each economically active member of the household. Even though family members worked on the same farm, revenues from their 'own agriculture' and 'own livestock' have been noted for each household member separately. However, it is difficult to isolate for each family member working on the same farm a specific 'income'. For this reason, one household income was calculated for all economic active household members. As most interviewees mentioned at least two sources of income per household member, including their farm and livestock production, the numbers below are quite high.

Graph 8. All sources of revenue



Graph 8 shows clearly that the major source of income for economically active household members in the sample was from their own agriculture (51.2 percent) and their own livestock production (32.0 percent). Others consider themselves self-employed (7.5 percent) in occupations such as shop keeping and beer brewing, or work as occasional workers (4 percent) or seasonal workers (3.1 percent). These cases are also most likely to have revenues from their own agriculture and livestock production, and consequently they figure in those categories as well. Only a few respondents work in the private sector or in the government, which can be explained by the remoteness of some villages. Nobody in the sample received any government assistance.

Only six households said they had no economically active household members. This is a very low number and indicates that to provide enough food for the household the whole family needs to be involved in subsistence agriculture. In only one household was a child under 14 years working. It should be assumed that more children help with agricultural tasks after school, and that the number of working children may be higher.

The average revenue from economic activities per year per household is 330 722 TSH (median 186 000 TSH). The minimum per year is 10 500 TSH and the maximum 8 590 000 TSH (generated by a self-employed person in Kolero). When dividing the household income from economic activities by household members, the average annual per capita income is 97 269 TSH (median 46 000 TSH). The household income is calculated based on revenue from the sale of crops, livestock and other farm goods, as well as all paid labour. The team is aware that these numbers should be treated with caution as individuals tend to give unrealistic estimates to provide answers that are 'favorable' to the project. The given numbers and calculations based on those figures should be considered as estimates rather than as exact and fully reliable data.

Three-quarters of the interviewees consider a man as the primary bread winner in the family, with the woman as the secondary bread winner. Daughters and sons in the households are mostly considered as tertiary bread winners. None of the respondents said that men and women shared bread-winning responsibilities equally.

About one-third of all households receive additional income from other sources, predominantly from money transfers from relatives within Tanzania (86 percent). About 7 percent received money from saving clubs or microfinance projects, and about 4 percent received money as gifts. Transfers from relatives are mostly sent once a year on specific, often celebratory, occasions. Only three respondents receive such support on a weekly basis, and 12 respondents on a monthly basis. Money from saving clubs is received either every six months or once a year, mainly by VSL members.

On an annual basis, about one in three households receives an average income of 127 626 TSH (median 80 000 TSH). The minimum annual income was 1 000 TSH and the maximum was 1 million TSH. The detailed distribution of additional household income is displayed in table 15.

Table 15. Amount of all additional income in TSH

Amount of all additional income (TSH)	Frequency	Percent	Valid Percent
Up to 10000	5	1.5	5.1
10001 to 20000	15	4.5	15.2
20001 to 50000	23	6.9	23.2
50001 to 100000	19	5.7	19.2
100001 to 200000	22	6.6	22.2
More than 200000	15	4.5	15.2
Total	99	29.7	100.0

Adding the external sources of income to the self-produced income (revenue), the average household income is 367 924 TSH (median 214 000 TSH) and the per capita income is 108 900 TSH (median 57 750 TSH). Overall this constitutes an income increase of roughly 11 percent (taking median values, an increase of 15 percent) generated through external sources.

3.10.2 Expenditures

Table 16 shows the statistics on annual household expenditures. Expenditures on household items are the most often noted expenses, although 31 interviewees did not know or chose not to answer this question. Expenses on health, education, agriculture, social issues and rent are listed by the majority of respondents¹¹.

¹¹ The exact distribution by type of expenditure can be seen in Annex A.

Table 16. Statistics on annual expenditures (in TSH)

Statistics on annual expenditures in TSH	1. Household expenditures	2. Health	3. Education/ school	4. Agriculture	5. Social issues	6. Rent for agricultural land
# valid	302	311	154	144	98	88
# missing	31	22	179	189	235	245
Mean	152488	13978	35291	50698	10969	16970
Median	86000	5000	18000	20000	5000	7000
Minimum	3600	1500	1000	3000	500	2000
Maximum	1800000	500000	480000	2000000	100000	480000

Taken all expenditures together, households need to cover annual expenditures of 258 666 TSH (125 000 TSH median). These figures are lower than the actual household incomes (self-produced or combined with external sources). As mentioned earlier, questions regarding income and expenditures are mostly retrospective and may be biased due to interviewer effects or by respondents desire to answer 'favorably'. These findings need to be treated carefully.

3.10.3 Balanced household income

The most pertinent question regarding household economics is the balance of income and expenditures, which provides an idea of the 'profit' each household makes. When deducting expenditures from the overall household income, most cases end up with negative numbers. This can be explained by two possible scenarios: *(i)* the data given is biased and unreliable or *(ii)* those are the real numbers and people live on credit.

A balanced income is calculated by adding up expenditures and income and dividing it by two. Table 11 provides the household income results.

Table 17. Mean values of balanced income

Mean values of balanced income	Annual balanced income		Daily balanced income		Annual balanced income per hh head		Daily balanced income per hh head	
	TSH	USD	TSH	USD	TSH	USD	TSH	USD
Valid	320	320	320	320	320	320	320	320
Missing	13	13	13	13	13	13	13	13
Mean	291609	165.9	799	0.45	84834	48.3	232	0.13
Median	193250	109.9	530	0.3	52125	29.7	143	0.08

With an exchange rate of 1 USD to 1 758 TSH (October 2011), the average annual balanced income is 291 609 TSH (median 193 250 TSH) or 165.9 USD per household. Divided by household heads, the average annual balanced income is 84 834 TSH or 48.3 USD. The highest annual balanced income per head is 69.18 USD in Kolero, followed by 57.4 USD in Mlagano and 44.9 USD in Kizagila. As seen before, the yields and revenue from the sale of goods in Mlagano and Kizagila are higher than for the other locations, and this also applies for the balanced income per head. Farmers in Kolero had lower revenue from the sale of goods, but their average balanced income is the highest. This can be explained by the fact that farmers in Kolero also earn more from additional paid labour, receive more external assistance and have lower expenditures for basic goods, transport and rent.

Using the annual Gross National Income (GNI)¹² per capita of 530 USD (World Bank 2010), the per capita mean value of the annual balanced income of 165 USD in the overall sample is very low -- only

¹² GNI calculated on a national level. When divided by the midyear population the GNI per capita is calculated.

one-third of the national value. When considering the median value (50 percent of all respondents) of 109.9 USD per year and household, the ratio is even worse at only 20 percent of the national level. These figures are quite alarming and are a testament to the overall impoverished socio-economic household situation in the area.

The values are even grimmer when calculating the daily household or per capita income and comparing this to the poverty levels usually used by the World Bank of 2 USD and 1.25 USD per person per day. According to World Bank data from 2007, 67.9 percent of Tanzanians had incomes under 1.25 USD per day and 87.9 percent under 2 USD. In this sample only two households and its members live above the poverty line of 1.25 USD per day and only one household with 2 USD per day. Even when dividing the daily balanced income only by the adults (economic active members) in the households, only three cases live above the poverty line of 1.25 USD and two cases above 2 USD per day. Those are very low values compared to the national average.

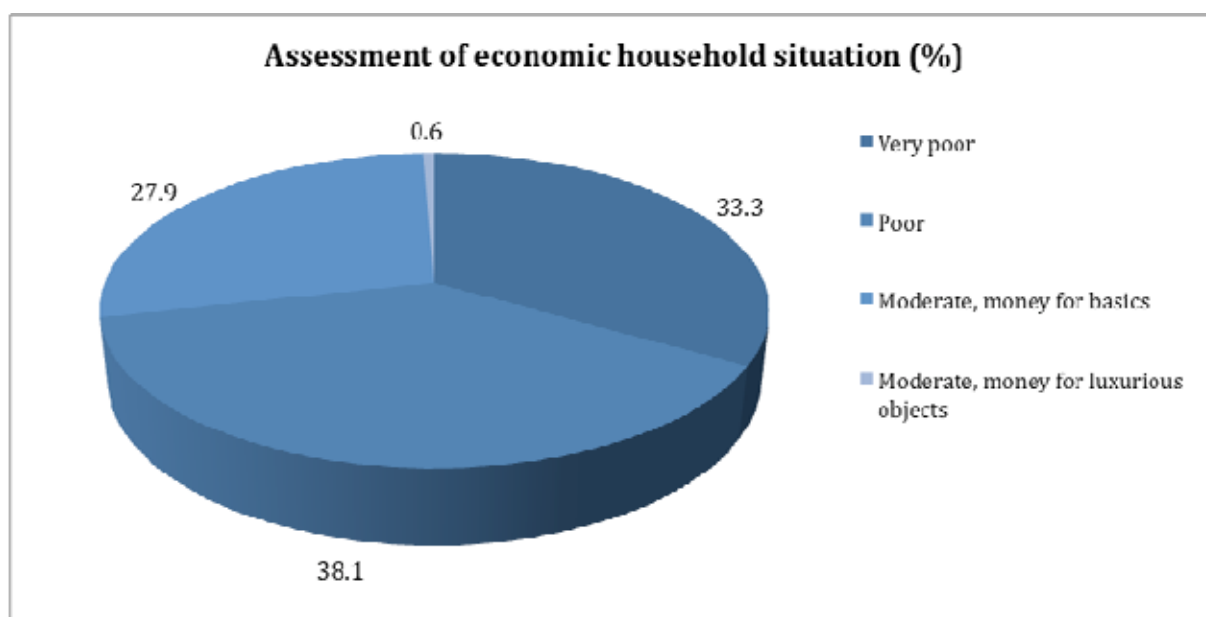
The calculations emphasize once more that the population in the project area predominantly live from their own agricultural production and practice subsistence farming. The income made from selling the surplus produce is spent on household goods that cannot be made at home, health care, education and rent for agricultural land.

HICAP and the MICCA Programme should consider the dire economic situation facing farmers in the area when developing further activities. Paying for improved equipment, seeds or seedlings is difficult for many families. Other payment structures (e.g. installment plans, barter, labour on FFS demonstration plots) should be considered.

3.10.4 Economic assessment and priorities

Given the findings above, it is not surprising that about a third of the interviewees consider themselves as very poor, and more than a third as poor (see graph 9). The remaining third describe their household situation as moderate with enough money available for basics such as school, food and clothing. Less than one percent consider their economic household situation as moderate with money available for luxury goods, such as a car or motorcycle.

Graph 9. Assessment of economic household situation (%)



A similar evaluation of the household economic situation can be found with project participants and female-headed households. None of the project participants considers their economic household situation as good with enough money to afford a good house and other luxury items. To get a better

understanding for the needs of households and their economic situation, interviewees had the opportunity to state their three main priorities in case more money became available.

Table 18. All mentioned priorities

All mentioned priorities	First Priority		Second Priority		Third Priority		All priorities	
	N	%	N	%	N	%	N	%
Better Food	100	30.2	49	15.3	49	15.3	195	19.9
Better Clothes	6	1.8	24	7.5	24	7.5	54	5.5
Repair house	100	30.2	72	22.5	72	22.5	253	25.9
Better health services	16	4.8	26	8.1	26	8.1	62	6.3
Better schools	5	1.5	13	4.1	13	4.1	29	3.0
Better water	1	.3	3	.9	3	.9	7	.7
Electricity supply			1	.3	1	.3	1	.1
Buy car or motorbike	7	2.1	8	2.5	8	2.5	21	2.1
Open shop/business	22	6.6	37	11.6	37	11.6	86	8.8
Start Professional training	5	1.5	10	3.1	10	3.1	22	2.2
Buy livestock	9	2.7	17	5.3	17	5.3	45	4.6
Hire farm staff	3	.9	8	2.5	8	2.5	21	2.1
Buy livestock goods/equipment	3	.9	4	1.3	4	1.3	12	1.2
Buy seeds	12	3.6	16	5.0	16	5.0	55	5.6
Buy agricultural goods/equipment	42	12.7	32	10.0	32	10.0	115	11.8
Total	331	100.0	320	100.0	320	100.0	978	100.0

The most commonly stated priority was house repairs (25.9 percent of all answers) and better food (19.9 percent). Those are also the most often mentioned first priorities and show the basic needs among the population. Buying agricultural goods and equipment was the priority of 11.8 percent of the interviewees. This indicates a desire to improve the agricultural practices and increase yields and food security. Less than 7 percent would like to open a shop (8.8 percent of all answers), which indicates some eagerness for finding additional sources of income and becoming less vulnerable to weather and climate variability. The same priorities are found among female-headed households.

In a future survey, the MICCA Programme hopes to see improvements in the self-evaluation of the economic household situation; that basic needs, such as food and housing, have been satisfied; and that priorities are more geared toward agriculture or even environmental concerns. Improving livelihoods and household food security is a long process, but the MICCA Programme's cooperation with HICAP and an emphasis on adopting more climate-smart agricultural practices that can improve resilience and productivity could lead to progress in this direction.

4. CONCLUSIONS AND RECOMMENDATIONS

The data show that, for families located in these remote areas, the main economic activities are cropping and raising small livestock. Surpluses from crops and livestock production are sold but only on a small-scale. An examination of revenues and overall household incomes, make it clear that agriculture is practiced on close to a subsistence basis.

HICAP has spent the majority its first year on interventions to raise awareness about the project and get buy-in from the farmers. In the sample, the percentage of project participants was rather low. Nevertheless, the findings show clear differences and initial success in comparison to non-participants regarding higher yields and higher productivity. The MICCA Programme is collaborating with HICAP to introduce a stronger climate change dimension into project activities and demonstrate the potential of climate-smart agriculture to assist farmers in mitigating and adapting to climate change. The MICCA Programme's interventions also supports FAO's organizational objective of increasing food security. It is therefore within the overall Programme's scop of activities to increase the livelihoods with climate-smart agriculture while at the same time targeting climate change.

To improve livelihoods and introduce climate change themes into HICAP activities, possible entry points for the MICCA Programme could be:

- raising awareness about climate change and the potential of CA to help farmers adapt to mitigate climate change by:
 - increasing farmers' knowledge about the causes of climate change;
 - emphasizing and supporting the 'proper' application of CA as a tool to assist farmers adapt to and mitigate climate change and providing technical training on other climate change mitigation tools; and
 - developing clear communication strategies and materials on the costs and benefits of CA.
- raising awareness on impact of slash and burn on climate by:
 - demonstrating the negative impact of slash and burn on climate change;
 - demonstrating that CA is an alternative to slash and burn that can mitigates climate change; and
 - developing clear messages on the cost and benefits of CA in comparison to slash and burn.
- increasing tree planting and protection by:
 - emphasizing the need for agroforestry as mean of income and as a climate change mitigation tool;
 - developing a strategy to disseminate knowledge on tools and practices to increase reforestation (e.g. planting trees, setting up nurseries, maintenance of trees); and
 - finding ways to combine CA and agroforestry for farmers.

Possible interventions should address men and women, and not just target project participants as others have started to adopt and learned from participants. Project participants should be trained to become 'multipliers' in the village to ensure greater community acceptance and increase the project's presence even in remote hamlets. This would also help overcome potential cultural beliefs that tend to create mistrust about outside interventions. Besides purely technical training, clear messages need to be developed showing the costs and benefits of training and the possible revenues generated by of CA over the long term.

To realize these recommendations and put them into action, coordination among all project components is needed. This coordination will allow for the identification of overlapping activities and potential synergies. Possible strategies and activities need to be developed together to avoid duplicating efforts and identify target audiences, activities and methods as well as indicators for monitoring and evaluating change. Findings should be compiled in an activity plan for all components, which could represent a possible road map for HICAP/MICCA Programme cooperation for the project site.

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

TARGET AUDIENCE

- When disseminating information men and women should be addressed equally as both are involved in decision-making processes.
- Interventions should not just focus on project participants because non-participants 'learn by seeing' and adopt practices after seeing successful models (particularly demonstration plots).
- The term 'adopter' as used by HICAP, could also encompass more climate-related indicators (e.g. willingness to plant and protect trees).
- HICAP and the MICCA Programme should consider the dire economic situation facing farmers in the area when developing further activities. Paying for improved equipment, seeds or seedlings is difficult for many families. Other payment structures (e.g. installment plans, barter, labour on FFS demonstration plots) should be considered.

PROJECT PARTICIPANTS

- Project participants asked for further training to improve their farming practices and enable them to 'defend' their involvement against skeptics. One approach would be train project participants as 'multipliers' in their village, carry out ongoing trainings activities and manage demonstration plots. Such an approach would lead to higher acceptance among villagers, give the project a greater presence in remote hamlets and allow for more activities to take place in different areas.
- Additional training for project participants may also help overcome cultural beliefs that create mistrust among villagers about outside interventions.
- Project interventions need to emphasize the correlation between initial training and possible investments and the long-term benefits of CA.

COST-BENEFIT MESSAGES

- To counteract possible misleading information about the costs and benefits of joining the project, clear and transparent messages and solid technical training need to be developed showing the benefits of training and the revenue that can be generated from CA over the long-term.

Considering these cross-cutting issues will help in the development of future interventions, lead to the formulation of clear messages and address specific target groups in a sustainable and locally adapted way.

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ANNEX 1. SOCIO-ECONOMIC SURVEY MICCA TANZANIA 2011

Annex A: Household questionnaire

HICAP- MICCA Project – Socio-economic Survey – Pilot projects Tanzania

No _____ Date _____ Interviewer _____ Village _____ Hamlet _____

Introduction: “My name is, and I am working for the FAO MICCA project which is cooperating with the HICAP 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 and 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 agricultural 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, education and profession

1a. People living in HH (persons staying there majority of 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]	40. Type of Source of Revenue *3* [ASK LATER!! - (several answers possible, mark DK, RA)]			41. Annual income in TSH [mark DK, RA] Remember to check q17			42. Main winner*4 [rank 1-3]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
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.	
5											1.	2.	3.	1.	2.	3.	

*1 1 = Married, 2= Married to several women 3 = Single 4 = Divorced 5 = Widowed 6 = Living together

*2 1 = Waluguru 2 = Wasagara 3 = Wakaguru 4 = Wandamba 5 = Wapogoro 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 (welfare, invalid)	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 and 3 = third important

PART B: PROJECT INVOLVEMENT

7.1 Did you ever participate in one of the HICAP projects interventions like trainings, awareness activities, saving groups or farmer schools?

1 = Yes

2 = No

88 = DK

99 = RA

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

Interventions		Yes [mark x]	Joined/participated in (mm/YYYY)
1.	Part of FFS		
2.	Training on AESA		
3.	Training on SWC		
4.	Training on SPM		
5.	Training Post Harvest Processing/Storage		
6.	Training on PTD		
7.	Training PVS		
8.	Training of Trainers		
9.	Received CA tools		
10.	Received Seeds and other products		
11.	Work on Demonstration plot		
12.	Exchange/study visit		
13.	Member of a VSL		
14.	Training to artisans for manufacturing of CA tools		
15.	Other		

AESA = Agro Ecological Analysis System

SWC = Soil and Water Conservation

VSL = Village Savings Loan

SPM = Selection, Planing, Management (business development)

PTD = Participatory Technology Development

PVS = Participatory Variety Selection

HOUSEHOLD IDENTIFICATION VARIABLES

Village code <i>[2 letters]</i>		Initial hh head		Birth year hh head	

Name of household head:_____

Kolero = KO

Mlagano = ML

Kasanga = KA

Kizagila = KI

Balani = BA

PART C: HOUSEHOLD ASSETS

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

	Yes	No	Items
8.1			Mobile phone
8.2			Bicycle
8.3			Motorbike
8.4			Car/truck
8.5			Radio / stereo
8.6			TV set or DVD
8.7			Satellite dish

	Yes	No	Items
8.8			Refrigerator
8.9			Own stand pipe
8.10			Own borehole/well
8.11			Own water tank
8.12			Access to shared well/borehole/stand pipe
8.13			Latrine/toilet
8.14			Other:

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

1 = Wood

5 = Solar panel

2 = Charcoal

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

3 = Biogas (stove)

7 = Other:

4 = Electricity

88 = DK

99 = RA

9.2 How much per week (give rough volume in kg/sacks or bags) [note all, mark DK, RA]

Volume per week

In :

(1 = kg, 2 = small sack, 3 = big sack, 4 = loose headload, 5 = solid headload, 6 = bundle (size), 7 = log (size))

PART D: AGRICULTURAL/LIVESTOCK PRACTICES TODAY

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

1 = Agriculture only

4 = None (continue q34)

2 = Livestock only (continue q20)

88 = DK

3 = Agriculture and Livestock

99 = RA

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

	Yes	No	Items
11.1			Hoe
11.2			Improved hoe
11.3			Machete
11.4			Shovel
11.5			Tractor
11.6			Thresher
11.7			Plough
11.8			Mechanical plough
11.9			Ox/donkey cart
11.10			No-till Seeder

	Yes	No	Items
11.11			Ripper
11.12			Biogas digester
11.13			Improved storage facility for crops (granary)
11.14			Barn for Livestock
11.15			Chaff cutter
11.16			Jab planter
11.17			Local storage facility
11.18			Ripper-planter
11.19			Other:
11.20			Other:

12. What different kind of agriculture do you practice today? [tick all, mark DK, RA]

	Yes	No	Activities
12.1			Horticulture / Garden
12.2			Slash and Burn
12.3			Planting and harvesting trees
12.4			Conservation agriculture
12.5			Livestock breeding
12.6			Subsistence farming only

	Yes	No	Activities
12.7			Commercial farming only
12.8			Own consumption and selling
12.9			Shifting cultivation
12.10			Bee keeping
12.11			Fish farming
12.12			Other:

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

1 = Yes

2 = No

88 = DK

99 = RA

13.2 If YES, what are the main problems (invasion from cattle, less rain, yield, disease)?

a. 1. Problem

b. 2. Problem

14.1 On what type of land do you practice agriculture today? *[tick all, mark DK, RA]*

	Yes	No	Activities
14.1			Own land/farm
14.2			Rented land/farm
14.3			Demonstration plots from the FFS group

	Yes	No	Activities
14.4			Clan-based land
14.5			Communal land
14.6			Other:

15. How big is the overall size of your land used for agriculture? *[Please assist interviewee to calculate all the agricultural land which is owned and other plots if applicable]*

Overall size of used land

In acres / m²

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

Plots	Crops / trees		Size		No. of trees	Manure [x]	Fert. [x]	Herb. [x]	Pest. [x]	Used as fodder [x]	Residue used as fodder [x]
			Portion size (Acres)	Plot Size (Acres)							
1	1.										
	2.										
	3.										
2	1.										
	2.										
	3.										
3	1.										
	2.										
	3.										
4	1.										
	2.										
	3.										

17. What was the yield in the last 12 months and what other products on the farm are you producing (beekeeping, selling fruits from trees, ...)? *[note all, mark DK,RA]*

	CROPS (from above) and other Products	Annual yield (in ...)	Able to sell? [x]	Annual quantity sold (in ...)	Annual revenue (in TSH)
1.					
2.					
3.					
4.					
5.					

18.1 Do you use any kind of irrigation in your agriculture? [tick once]

1 = Yes

2 = No

88 = DK

99 = RA

18.2 If YES, what kind of irrigation?

a. 1. Irrigation type

b. 2. Irrigation type

18.3 What kind of problems do you face regarding irrigation?

1. Problem

2. Problem

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

1 = Yes

2 = No

88 = DK

99 = RA

19.2 If Yes, what kind and how many? [note all, mark DK,RA]

Type of trees		Planted trees		Protected trees	
		No of	location	No of	location
1.					
2.					
3.					
4.					

*1 = Own land/farm

2 = Rented land/farm

3 = Demonstration plots

4 = Clan-based land

5 = Communal land

6 = Other

88 = DK

99 = RA

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

1 = Yes

2 = No

88 = DK

99 = RA

20. In case you own livestock, what kind of Livestock do you have? [note all, mark DK, RA]

	Livestock	No of		Livestock	No of
20.1	Pigs		20.4	Ducks	
20.2	Goats		20.5	Guinea pigs	
20.3	Chicken		20.6	Other:	

PART E: CONSERVATION AGRICULTURE

21. 1 Do you know anything about conservation agriculture (Kilimo Hifadhi)? [tick once]

1 = Yes

2 = No

88 = DK

99 = RA

21.2 If YES, what is it?

a. 1. Description:

b. 2. Description:

22. Do you practice any of the following agriculture techniques? [tick all, mark DK, RA]

	Yes	No	Techniques		Yes	No	Techniques
22.1			Double digging	22.7			Crop cover
22.2			Mulching	22.8			Intercropping
22.3			Avoid slash and burn	22.9			No/minimum tillage
22.4			Crop rotation/diversification	22.10			Ridge cultivation
22.5			Planting in rows	22.11			Direct seeding
22.6			Planting hedge rows	22.12			Other:

In case the household does not practice any of the above mentioned techniques, continue with q 29.

23. Which of the techniques mentioned above (q22) have been most beneficial to increase your agricultural productivity?

a. 1. Technique:

b. 2. Technique:

24. Who decided to use these kind of techniques and why?

a. Who decided:

b. Reason to change:

25.1. Did you have to make any initial investments when you started CA? [tick once]

1 = Yes

2 = No

88 = DK

99 = RA

25.2 If Yes, what kind and for what? [Remind them about labour, money, equipment ...]

Type of costs		Initial amount in TSH
1.		
2.		
3.		

26.1 Do you have additional costs due to using CA? [tick once]

1 = Yes

2 = No

88 = DK

99 = RA

26.2 If Yes, what kind and for what? [Please enter for each type and add if needed]

Type of costs		In	Amount in last 12 months
1.	Labor	TSH	
2.	Equipment	TSH	
3.	Resources (seedlings, seeds, manure)	TSH	
4.	Additional Time	Hours (per year)	

5.	Agrochemicals	TSH	
6.	Other:.....		

27.1 Do you think you have more benefits or more disadvantages from using CA so far? [tick once]

1 = More benefits

4 = Neither nor

2 = More disadvantages

88 = DK

3 = Even/balanced

99 = RA

27.2 What do you consider the main benefits from using CA?

a. 1. Benefit

b. 2. Benefit

27.3 What do you consider the main disadvantages from using CA?

a. 1. Disadvantage

b. 2. Disadvantage

28.1 In your opinion, did your income increase due to CA in the last 12 months? [tick once]

1 = Yes

2 = No

88 = DK

99 = RA

28.2 If Yes, looking at all possible changes due to CA (additional crops, new businesses etc.) how much more 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		Additional amount (in last 12 months)	In
1.			TSH
2.			TSH
3.			TSH

28.3 In case you were able to start a business in the last 12 months, what kind of business?

a. 1. Business

b. 2. Business

PART F: HOUSEHOLDS NOT PRACTICING CA

(This section is for households who do not practice CA, not practice anything in q22)

29.1 Are you satisfied with your current agricultural practices and yields or do you face problems? [tick once]

1 = Very satisfied, have no problems

4 = a lot of problems, not satisfied at all

2 = Almost always satisfied, some problems

5 = Other:

6 =

3 = Number of problems but mainly satisfied

88 = DK 99 = RA

29.2 In case you face problems regarding agriculture, what kind of problems are those?

a. 1. Problem

b. 2. Problem

30. Have you heard of CA? [tick once]

1 = Yes

2 = No

88 = DK

99 = RA

[If No, please give background and explain main ideas of CA and HICAP project before continuing to ask next question]

31. You said you are not practicing CA, please describe us why you decided not to use those techniques and who decided not to use them?

a. 1. Reason

b. 2. Person

32. As you are not practicing any CA, what would you need/wish for so you would start using those CA techniques? [tick all, mark DK, RA]

	Yes	No	Items		Yes	No	Items
32.1			More training	32.6			See good examples
32.2			Lower costs of initial investment	32.7			More immediate benefit/revenue
32.3			Less maintenance costs	32.8			More assistance from a project
32.4			More labour force	32.9			Other:
32.5			More equipment	32.10			

33. If you would have the opportunity to produce more yield, in a more environmental friendly way, what would you be willing to invest?

Amount per month:

in TSH

Hours per week of own labour

h/week in addition to now

PART G: LABOUR, MARKET AND FOOD SECURITY

34. Where are the next mar kets that you sell your products? Please state all markets you travel to on a regular basis (at least four times a year). [note all]

	Name of market / village	Sold goods (incl. fodder legume, milk.)	Frequen cy*	Distance (both ways in km)	Mode of transport*	Cost for each visit (both ways) (in TSH)
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

**1 = By foot(personally) 2 = By bicycle(personally) 3 = By minibus (personally) 4 = By truck (personally)
 5 = By other farmer(foot) 6 = Bicycle (other farmer) 7 = Minibus (other farmer) 8 = Truck (other farmer)
 9 = Other..... 88 = DK 99 = RA

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

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

35.2 If yes, how many and for how long? [note all, mark DK,RA]

	Staff	Permanent staff/laborer		Casual Laborer	
		No of	Main tasks	Man day/year	Main tasks
a.	Women				
b.	Men				
c.	Girls under 14				
d.	Boys under 14				

36.1 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

36.2 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

PART H: CLIMATE AND MITIGATION AWARENESS AND KNOWLEDGE

37.1 Have you ever heard of the term 'Climate Change'? [tick once]

1 = Yes

2 = No

88 = DK

99 = RA

37.2 If YES, what is it?

37.3 If NO, what could it be?

38. 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 q39.1]

5 = Dry season much longer

2 = More rainfall

6 = Other.....

3 = Less rainfall

4 = More floods

88 = DK

99 = RA

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

a. Impact 1:

b. Impact 2:

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

a. Impact 1:

b. Impact 2:

38.3 Due to observed changes, what did you change regarding your livestock/agriculture?

a. *Change 1:*

b. *Change 2:*

38.4 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:*

39.1 We learned that a lot of farmers used to practice 'slash and burn' in this area. Could you tell us what this is?

a. *1. Explanation*

b. *2. Explanation*

39.2 Why do they do it?

a. *1. Reason*

b. *2. Reason*

39.3 Why don't people give it up?

a. *1. Reason*

b. *2. Reason*

PART I: ECONOMIC SITUATION

40. to 43. Interviewer: Ask questions 40 to 43 in Table on page 1

44.1 Do you have additional sources of household income [tick only one]?

1 = Yes

2 = No

88 = DK

99 = RA

44.2 If Yes, what kind of sources?

	Type of Sources*	Frequency**	Amount per year in TSH
a.	1.		
b.	2.		
c.	3.		

*1=Transfer from relative abroad

2 = Transfer from relative in TAN

3 = Gifts

4 = Saving Clubs/Microfinance

5 = Credit from bank/friend/project

6 = Food and animals

7 = Other (fill in row)

88 = DK

99 = RA

**1 = Once a week

2 = Once a month

3 = Twice a month

4 = Every six months

5 = Once a year

6 = irregular

7 = other

45. Please share with us your monthly expenditures in TSH. [Reassure the interviewee that information will be treated anonymously at all times. Note monthly OR annual amount, preferably monthly. Enter DK/RA where applicable.]

	Items of Expenditure	TSH/month	TSH/year
45.1	Household expenditures (food, soap, phone, taxes)		
45.2	Health		
45.3	Education		
45.4	Agriculture (incl. of staff, equipment)		

45.5	Livestock (incl. of staff, veterinary services)		
45.6	Social expenditures (gifts, weddings)		
45.7	Transport		
45.8	Rent: agricultural land		
45.9	Rent: for house		
45.10	ENERGY		
45.11	Other:		

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

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

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

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

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

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

88 = DK 99 = RA

47. 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
47.1	Better food	47.8	Open shop or start business
47.2	Better clothes	47.9	Start professional training / studies
47.3	Repair, rebuilt house	47.10	Buy livestock
47.4	Better health services	47.11	Hire farm staff
47.5	Better schools (clothing, books)	47.12	Buy livestock goods/equipment
47.6	Better water/sanitation/sewerage system	47.13	Buy seeds/trees
47.7	Electricity supply	47.14	Buy agricultural goods/equipment
47.8	Buy car or motorbike	47.15	Other:

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

48. 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 2
TABLES PER QUESTION (Q) IN HOUSEHOLD QUESTIONNAIRE

Annex B: Tables per question (q) in household questionnaire ¹³

Q0

0 Date of Interview and location	Village											
	Kolero		Kasanga		Balani		Mlangano		Kizagila		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
27.09.11	26	36.1%	5	7.8%	0	.0%	0	.0%	0	.0%	31	9.3%
28.09.11	0	.0%	29	45.3%	0	.0%	0	.0%	0	.0%	29	8.7%
29.09.11	0	.0%	30	46.9%	0	.0%	0	.0%	0	.0%	30	9.0%
30.09.11	0	.0%	0	.0%	43	62.3%	0	.0%	0	.0%	43	12.9%
03.10.11	0	.0%	0	.0%	26	37.7%	0	.0%	0	.0%	26	7.8%
04.10.11	0	.0%	0	.0%	0	.0%	64	100.0%	0	.0%	64	19.2%
06.10.11	0	.0%	0	.0%	0	.0%	0	.0%	39	60.9%	39	11.7%
07.10.11	0	.0%	0	.0%	0	.0%	0	.0%	25	39.1%	25	7.5%
Total	72	100.0%	64	100.0%	69	100.0%	64	100.0%	64	100.0%	333	100.0%

Q1

1.a Number of people living in the household	Statistics
N Valid	333
N Missing	0
Mean	4.09
Median	4.00
Minimum	1
Maximum	8
Sum	1362

¹³ To navigate to specific question: With strg+f open search option, enter q and the desired question number

1.b Number of people living in the household	Frequency	Percent	Valid Percent
1	22	6.6	6.6
2	40	12.0	12.0
3	61	18.3	18.3
4	70	21.0	21.0
5	69	20.7	20.7
6	46	13.8	13.8
7	24	7.2	7.2
8	1	.3	.3
Total	333	100.0	100.0

1.c Number of adults living in household	Statistics
N Valid	333
N Missing	0
Mean	2.23
Median	2.00
Minimum	1
Maximum	6
Sum	744

1.d Number of adults living in household	Frequency	Percent	Valid Percent
1	59	17.7	17.7
2	173	52.0	52.0
3	74	22.2	22.2
4	20	6.0	6.0
5	5	1.5	1.5
6	2	.6	.6
Total	333	100.0	100.0

1.e Number of children living in household	Statistics
N Valid	250
N Missing	83
Mean	2.4840
Median	2.0000
Minimum	1.00
Maximum	6.00
Sum	621.00

1.f Number of children living in household	Frequency	Percent	Valid Percent
1.00	50	15.0	20.0
2.00	89	26.7	35.6
3.00	63	18.9	25.2
4.00	37	11.1	14.8
5.00	10	3.0	4.0
6.00	1	.3	.4
Total	250	75.1	100.0

1.g Sex of interview partner	Frequency	Percent	Valid Percent
Man	195	58.6	58.6
Woman	130	39.0	39.0
Boy	7	2.1	2.1
Girl	1	.3	.3
Total	333	100.0	100.0

1.h Head of household	Frequency	Percent	Valid Percent
Man	246	73.9	73.9
Woman	87	26.1	26.1
Total	333	100.0	100.0

Q2

2. Age statistics	Age of interviewee	Age of youngest household member	Age of oldest household member
N Valid	332	332	329
N Missing	1	1	4
Mean	45.87	14.0404	49.09
Median	45.00	8.0000	49.00
Minimum	15	.10	10
Maximum	80	70.00	85
Sum	15230	4661.40	16152

Q3

3. Marital status of interviewee	Frequency	Percent	Valid Percent
Married	216	64.9	64.9
Married to several women	3	.9	.9
Single	30	9.0	9.0
Divorced	46	13.8	13.8
Widowed	36	10.8	10.8
Living together	2	.6	.6
Total	333	100.0	100.0

Q4

4. Ethnic group of interviewee	Frequency	Percent	Valid Percent
Waluguru	330	99.1	99.1
Wakaguru	2	.6	.6
Other	1	.3	.3
Total	333	100.0	100.0

Q5

5.a Number of household members never been to school	Statistics
N Valid	185
N Missing	148
Mean	1.37
Median	1.00
Minimum	1
Maximum	3
Sum	253

5.b Number of household members never been to school	Frequency	Percent	Valid Percent
1	121	36.3	65.4
2	60	18.0	32.4
3	4	1.2	2.2
Total	185	55.6	100.0

5.c Number of under 14 year old never been to school	Statistics
N Valid	4
N Missing	329
Mean	1.25
Median	1.00
Minimum	1
Maximum	2
Sum	5

5.d Number of under 14 year old never been to school	Frequency	Percent	Valid Percent
1	3	.9	75.0
2	1	.3	25.0
Total	4	1.2	100.0

5.e Number of household members already out of school	Statistics
N Valid	275
N Missing	58
Mean	1.99
Median	2.00
Minimum	1
Maximum	5
Sum	546

5.f Number of household members already out of school	Frequency	Percent	Valid Percent
1	94	28.2	34.2
2	119	35.7	43.3
3	39	11.7	14.2
4	18	5.4	6.5
5	5	1.5	1.8
Total	275	82.6	100.0

5.g Number of under 14 year old already out of school	Statistics
N Valid	2
N Missing	331
Mean	1.00
Median	1.00
Minimum	1
Maximum	1
Sum	2

Only 2 households have one child younger than 14 years old already out of school.

5.h Number of household members currently in school	Statistics
N Valid	195
N Missing	138
Mean	1.73
Median	2.00
Minimum	1
Maximum	4
Sum	338

5.i Number of household members currently in school	Frequency	Percent	Valid Percent
1	90	27.0	46.2
2	71	21.3	36.4
3	30	9.0	15.4
4	4	1.2	2.1
Total	195	58.6	100.0

Q6

6.a Number of adult invalids in the household	Statistics
N Valid	5
N Missing	328
Mean	1.00
Median	1.00
Minimum	1
Maximum	1
Sum	5

6.b Number of adult invalids in the household	Frequency	Percent	Valid Percent
1	5	1.5	100.0
Total	5	1.5	100.0

6.c Number of invalid children in the household	Statistics
N Valid	8
N Missing	325
Mean	1.13
Median	1.00
Minimum	1
Maximum	2
Sum	9

6.d Number of invalid children in the household	Frequency	Percent	Valid Percent
1	7	2.1	87.5
2	1	.3	12.5
Total	8	2.4	100.0

Q7

7.a Interviewee participated in the project	Frequency	Percent	Valid Percent
Yes	58	17.4	17.4
No	275	82.6	82.6
Total	333	100.0	100.0

7.b Project Participation (1)	1. Part of FFS		2. Training in AESA		3. Training in SWC		4. Training in SPM		5. Training in Post Harvest Processing		6. Training in PTD		7. Training in PVS	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	42	72.4	17	29.3	13	22.4	4	6.9	4	6.9	1	1.7	4	6.9
No	16	27.6	41	70.7	45	77.6	54	93.1	54	93.1	57	98.3	54	93.1
Total	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0

7.c Project Participation (2)	8. Training of trainers		9. Received CA tools		10. Received seeds		11. Work on demonstration plot		12. Participated in exchange visits		13. Member of a VSL		14. Training to artisans	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	13	22.4	10	17.2	25	43.1	22	37.9	13	22.4	29	50	0	.0
No	45	77.6	48	82.8	33	56.9	35	60.3	45	77.6	29	50	58	100.0
Total	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0

7.d Dates when joining project	Frequency	Percent
SEP 2009	1	3.6
DEC 2009	2	7.1
FEB 2010	1	3.6
JUL 2010	2	7.1
AUG 2010	3	10.7
SEP 2010	6	21.4
OCT 2010	5	17.9
NOV 2010	2	7.1
DEC 2010	3	10.7
JAN 2011	1	3.6
JUL 2011	1	3.6
AUG 2011	1	3.6
Total	28	100.0

Q8

8.a 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	75	22.5	36	10.8	0	.0	2	.6	228	68.5	4	1.2	2	.6
No	258	77.5	297	89.2	333	100.0	331	99.4	105	31.5	328	98.8	331	99.4
Total	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0	332	100.0	333	100.0

8.b 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	0	.0	6	1.8	137	41.1	1	.3	294	88.3	322	96.7
No	333	100.0	327	98.2	196	58.9	332	99.7	39	11.7	11	3.3
Total	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0

One respondent owns a generator.

Q9

9.a Main energy resource of household	Frequency	Percent	Valid Percent
Wood	332	99.7	99.7
Charcoal	1	.3	.3
Total	333	100.0	100.0

From all households using wood, 42 cases gave required volumes in kg:

9.b Energy required per week: Volume in kg	Statistics
N Valid	42
N Missing	0
Mean	22.36
Median	20.00
Minimum	5
Maximum	50
Sum	939

9.c Energy required per week: Volume in kg	Frequency	Percent	Valid Percent
5	1	2.4	2.4
10	5	11.9	11.9
12	3	7.1	7.1
14	1	2.4	2.4
15	3	7.1	7.1
16	1	2.4	2.4
17	1	2.4	2.4
18	3	7.1	7.1
20	7	16.7	16.7
23	2	4.8	4.8
26	1	2.4	2.4
27	1	2.4	2.4
28	1	2.4	2.4
30	4	9.5	9.5
34	1	2.4	2.4
35	2	4.8	4.8
36	1	2.4	2.4
37	1	2.4	2.4
38	1	2.4	2.4
50	2	4.8	4.8
Total	42	100.0	100.0

9.d Weekly wood consumption per head in kg	Statistics
N Valid	42
N Missing	291
Mean	5.7172
Median	5.1429
Minimum	2.00
Maximum	12.50
Sum	240.12

9.e Weekly required loose head loads	Statistics
N Valid	188
N Missing	0
Mean	2.57
Median	2.00
Minimum	1
Maximum	7
Sum	484

9.f Weekly required loose head loads	Frequency	Percent	Valid Percent
1	24	12.8	12.8
2	86	45.7	45.7
3	46	24.5	24.5
4	19	10.1	10.1
5	8	4.3	4.3
6	1	.5	.5
7	4	2.1	2.1
Total	188	100.0	100.0

9.g Weekly required solid head loads	Statistics
N Valid	98
N Missing	0
Mean	2.14
Median	2.00
Minimum	1
Maximum	5
Sum	210

9.h Weekly required solid head loads	Frequency	Percent	Valid Percent
1	17	17.3	17.3
2	53	54.1	54.1
3	26	26.5	26.5
4	1	1.0	1.0
5	1	1.0	1.0
Total	98	100.0	100.0

Q10

10.a Household practicing Agriculture or Livestock	Frequency	Percent	Valid Percent
Cropping only	80	24.0	24.0
Livestock only	1	.3	.3
Cropping and Livestock	251	75.4	75.4
None	1	.3	.3
Total	333	100.0	100.0

Q11

11.a Farming assets (1)	1. Hoe		2. Improved hoe		3. Machete		4. Shovel		5. Tractor		6. Thresher		7. Plough		8. Mechanical plough		9. Ox/donkey cart	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	323	97.3	14	4.2	308	92.8	112	33.7	3	.9	108	32.5	2	.6	1	.3	4	1.2
No	9	2.7	318	95.8	24	7.2	220	66.3	328	99.1	224	67.5	330	99.4	331	99.7	328	98.8
Total	332	100	332	100	332	100.0	332	100.0	331	100.0	332	100.0	332	100.0	332	100	332	100.0

11.b Farming assets (2)	10. No-till seeder		11. Ripper		12. Biogas digester		13. Improved storage (granary)		14. Barn for livestock		15. Chaff cutter		16. Jab planter		17. Local storage facility		18. Ripper planter	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	7	2.1	7	2.1	0	.0	7	2.1	133	40.1	0	.0	18	5.4	132	39.8	5	1.5
No	325	97.9	325	97.9	332	100.0	325	97.9	199	59.9	332	100.0	314	94.6	200	60.2	327	98.5
Total	332	100	332	100	332	100.0	332	100.0	332	100.0	332	100.0	332	100.0	332	100	332	100.0

One household owns a rope and six other households own a sickle.

Q12

12.a Agriculture practices (1)	1. Horticulture/ gardening		2. Slash and Burn		3. Planting and harvesting trees		4. Conservation Agriculture		5. Livestock breeding		6. Subsistence farming only	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	52	15.7	181	54.5	16	4.8	57	17.2	118	35.5	28	8.4
No	280	84.3	151	45.5	316	95.2	275	82.8	214	64.5	304	91.6
Total	332	100.0	332	100.0	332	100.0	332	100.0	332	100.0	332	100.0

12.b Agriculture practices (12)	7. Commercial farming only		8. Own consumption and selling of crops		9. Shifting Cultivation		10. Harvest bushes and fruits		11. Fish farming	
	N	%	N	%	N	%	N	%	N	%
Yes	81	24.4	304	91.6	40	12.0	1	.3	2	.6
No	251	75.6	28	8.4	292	88.0	331	99.7	330	99.4
Total	332	100.0	332	100.0	332	100.0	332	100.0	332	100.0

Q13

13.a Faces problem in agriculture	Frequency	Percent	Valid Percent
Yes	322	96.7	97.3
No	9	2.7	2.7
Total	331	99.4	100.0

13.b All mentioned problems regarding agriculture	Frequency	Valid Percent
Diseases	138	27.2
Crops dry	14	2.8
Prolonged dry season	49	9.7
High temperatures	1	.2
Cold temperatures	1	.2
Lack of equipment/implements	25	4.9
Lack of seeds	8	1.6
Lack of finances	12	2.4
Lack of labor	6	1.2
Lack of land	12	2.4
Low rainfall	71	14.0
Unpredictable rainfall	12	2.4
Low yield	98	19.3
Poor soil fertility	21	4.1
Shortage of food	1	.2
Soil erosion	3	.6
Invasion of animals	21	4.1
Lack of knowledge	1	.2
More rain/floods	3	.6
Lack of market	2	.4
Lack of water	1	.2

Poor weather	1	.2
Other	6	1.2
Total	507	100.0

Q14

14. Location of agriculture	1. On own land		2. On rented land		3. On demonstration plot of FFS		4. On clan-based land		5. On communal land		6. On other land	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	185	55.7	125	37.7	5	1.5	58	17.5	8	2.4	1	0.3
No	147	44.3	207	62.3	327	98.5	274	82.5	324	97.6	331	99.7
Total	332	100.0	332	100.0	332	100.0	332	100.0	332	100.0	332	100.0

One farmer mentioned to cultivating on inherited land.

Q15

15.a Overall land size used for agriculture	Statistics
N Valid	332
N Missing	1
Mean	2.5565
Median	2.0000
Minimum	.25
Maximum	10.00
Sum	848.75

15.b Overall land size used for agriculture	Frequency	Percent	Valid Percent
Up to 0.5	13	3.9	3.9
0.51 to 1	54	16.2	16.3
1.1 to 2	106	31.8	31.9
2.1 to 3	72	21.6	21.7
3.1 to 4	56	16.8	16.9
More than 4	31	9.3	9.3
Total	332	99.7	100.0

Q16

16.a Number of cultivated plots	Statistics
N Valid	332
N Missing	1
Mean	2.90
Median	3.00
Minimum	1
Maximum	4
Sum	962

16.b Number of cultivated plots	Frequency	Percent	Valid Percent
1	29	8.7	8.7
2	88	26.4	26.5
3	1	.3	.3
3	102	30.6	30.7
4	112	33.6	33.7
Total	332	99.7	100.0

16.c Statistics on intercropping on plots	Number of crops intercropping on plot1	Number of crops intercropping on plot2	Number of crops intercropping on plot3	Number of crops intercropping on plot4
N Valid	332	305	215	111
N Missing	1	28	118	222
Mean	1.42	1.26	1.16	1.15
Median	1.00	1.00	1.00	1.00
Minimum	1	1	1	1
Maximum	3	3	2	3
Sum	470	386	249	128

16.d Number of crops intercropping on plot1	Frequency	Percent	Valid Percent
1	216	64.9	65.1
2	94	28.2	28.3
3	22	6.6	6.6
Total	332	99.7	100.0

16.e Number of crops intercropping on plot2	Frequency	Percent	Valid Percent
1	228	68.5	74.8
1	3	.9	1.0
2	68	20.4	22.3
3	6	1.8	2.0
Total	305	91.6	100.0

16.f Number of crops intercropping on plot3	Frequency	Percent	Valid Percent
1	181	54.4	84.2
2	34	10.2	15.8
Total	215	64.6	100.0

16.g Number of crops intercropping on plot4	Frequency	Percent	Valid Percent
1	95	28.5	85.6
2	15	4.5	13.5
3	1	.3	.9
Total	111	33.3	100.0

16.h All crops on all fields	Frequency	Valid Percent
Beans	21	1.7
Maize	321	26.1
Sorghum	117	9.5
Banana	68	5.5
Sesame	116	9.4
Cassava	235	19.1
Paddy	206	16.7
Coconut	2	.2
Sugar cane	1	.1
Groundnuts	18	1.5
Sweet potatoes	2	.2
Cow peas	23	1.9
Pigeon peas	69	5.6
Pumpkins	4	.3
Tomatoes	7	.6
Jack fruits	4	.3
Pineapples	3	.2
Orange tree	2	.2
Vegetables	10	.8
Lablab	2	.2
Total	1231	100.1

16.i Statistics on plot sizes	Overall plot 1 size	Overall plot 2 size	Overall plot 3 size	Overall plot 4 size
N Valid	332	298	210	103
N Missing	1	35	123	230
Mean	1.1227	.8876	.7417	.6578
Median	1.0000	1.0000	.5000	.5000
Minimum	.25	.25	.25	.25
Maximum	25.00	3.50	3.50	3.00
Sum	372.75	264.50	155.75	67.75

16.j Overall plot 1 sizes	Frequency	Percent	Valid Percent
.25	30	9.0	9.0
.50	88	26.4	26.5
.75	11	3.3	3.3
1.00	114	34.2	34.3
1.25	2	.6	.6
1.50	30	9.0	9.0
2.00	41	12.3	12.3
2.50	4	1.2	1.2
3.00	9	2.7	2.7
3.50	1	.3	.3
4.00	1	.3	.3
25.00	1	.3	.3
Total	332	99.7	100.0

16.k Overall plot 2 sizes	Frequency	Percent	Valid Percent
.25	49	14.7	16.4
.50	89	26.7	29.9
.75	5	1.5	1.7
1.00	99	29.7	33.2
1.25	2	.6	.7
1.50	22	6.6	7.4
1.75	1	.3	.3
2.00	24	7.2	8.1
2.25	1	.3	.3
2.50	3	.9	1.0
3.00	1	.3	.3
3.50	2	.6	.7
Total	298	89.5	100.0

16.l Overall plot 3 sizes	Frequency	Percent	Valid Percent
.25	54	16.2	25.7
.50	64	19.2	30.5
.75	6	1.8	2.9
1.00	64	19.2	30.5
1.25	1	.3	.5
1.50	10	3.0	4.8
2.00	7	2.1	3.3
2.50	2	.6	1.0
3.00	1	.3	.5
3.50	1	.3	.5
Total	210	63.1	100.0

16.m Overall plot 4 sizes	Frequency	Percent	Valid Percent
.25	27	8.1	26.2
.50	41	12.3	39.8
.75	3	.9	2.9
1.00	26	7.8	25.2
1.25	1	.3	1.0
1.50	2	.6	1.9
2.00	1	.3	1.0
3.00	2	.6	1.9
Total	103	30.9	100.0

16.n Size of all plots	Statistics
N Valid	323
N Missing	10
Mean	2.5975
Median	2.0000
Minimum	.25
Maximum	25.00
Sum	839.00

16.o Size of all plots	Frequency	Percent	Valid Percent
.25	1	.3	.3
.50	8	2.4	2.5
.75	9	2.7	2.8
1.00	43	12.9	13.3
1.25	12	3.6	3.7
1.50	27	8.1	8.4
1.75	6	1.8	1.9
2.00	66	19.8	20.4

2.25	9	2.7	2.8
2.50	9	2.7	2.8
2.75	7	2.1	2.2
3.00	44	13.2	13.6
3.25	2	.6	.6
3.50	11	3.3	3.4
3.75	4	1.2	1.2
4.00	32	9.6	9.9
4.25	2	.6	.6
4.50	4	1.2	1.2
5.00	8	2.4	2.5
5.25	1	.3	.3
5.50	7	2.1	2.2
5.75	1	.3	.3
6.00	5	1.5	1.5
7.75	1	.3	.3
8.00	1	.3	.3
8.25	1	.3	.3
10.00	1	.3	.3
25.00	1	.3	.3
Total	323	97.0	100.0

16.p All plants manure being applied	Frequency	Valid Percent
Maize	2	50.0
Sorghum	1	25.0
Sesame	1	25.0
Total	4	100.0

No household uses fertilizers, herbicides or pesticides.

One household uses cassava as fodder.

16.q All plants residue being used as fodder	Frequency	Valid Percent
Maize	4	50.0
Sorghum	1	12.5
Cassava	1	12.5
Paddy	2	25.0
Total	8	100.0

Q17

17.a All produced goods (on farm)	Frequency	Valid Percent
Beans	16	1.2
Maize	304	22.5
Sorghum	110	8.2
Banana	64	4.7
Sesame	114	8.5
Cassava	226	16.8
Paddy	206	15.3
Coconut	1	.1
Sugar cane	1	.1
Groundnuts	18	1.3
Sweet potatoes	2	.1
Cow peas	21	1.6
Pigeon peas	63	4.7
Pumpkins	3	.2
Tomatoes	5	.4
Jack fruits	5	.4
Pineapples	1	.1
Orange tree	1	.1
Vegetables	9	.7
Lablab	2	.1

Pigs	25	1.9
Goats	24	1.8
Chicken	109	8.1
Eggs	19	1.4
Total	1349	100.0

17.b Statistics on Annual yields in kg	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	289	98	108	198	121	55	55	15
N Missing	44	235	225	135	212	278	278	318
Mean	217.4444	210.4245	170.7922	171.1222	393.9504	732.5455	78.3596	32.0160
Median	152.0000	128.0000	114.0000	95.0000	288.0000	300.0000	51.6000	24.4000
Minimum	6.08	3.20	3.80	3.80	32.00	60.00	.86	2.44
Maximum	3724.00	3264.00	1330.00	1330.00	1920.00	3000.00	344.00	100.00
Sum	62841.44	20621.60	13151.00	18481.20	47668.00	40290.00	4309.78	480.24

17.c Annual yield of maize (in kg)	Frequency	Percent	Valid Percent
Up to 25	25	7.5	8.7
25.1 to 50	36	10.8	12.5
50.1 to 100	65	19.5	22.5
100.1 to 200	59	17.7	20.4
200.1 to 300	46	13.8	15.9
300.1 to 400	30	9.0	10.4
More than 400	28	8.4	9.7
Total	289	86.8	100.0

17.d Annual yield of sorghum (in kg)	Frequency	Percent	Valid Percent
Up to 25	11	3.3	11.2
25.1 to 50	14	4.2	14.3
50.1 to 100	16	4.8	16.3
100.1 to 150	14	4.2	14.3
150.1 to 200	15	4.5	15.3
200.1 to 400	21	6.3	21.4
More than 400	7	2.1	7.1
Total	98	29.4	100.0

17.e Annual yield of sesame (in kg)	Frequency	Percent	Valid Percent
Up to 25	12	3.6	11.1
25.1 to 50	14	4.2	13.0
50.1 to 100	29	8.7	26.9
100.1 to 150	12	3.6	11.1
150.1 to 200	20	6.0	18.5
200.1 to 400	11	3.3	10.2
More than 400	10	3.0	9.3
Total	108	32.4	100.0

17.f Annual yield of paddy (in kg)	Frequency	Percent	Valid Percent
Up to 30	28	8.4	14.1
30.1 to 60	32	9.6	16.2
60.1 to 90	40	12.0	20.2
90.1 to 120	22	6.6	11.1
120.1 to 240	39	11.7	19.7
240.1 to 360	23	6.9	11.6
More than 360	14	4.2	7.1
Total	198	59.5	100.0

17.g Annual yield of cassava (in kg)	Frequency	Percent	Valid Percent
Up to 50	10	3.0	8.3
51 to 100	18	5.4	14.9
101 to 200	24	7.2	19.8
201 to 400	25	7.5	20.7
401 to 800	29	8.7	24.0
801 to 1200	8	2.4	6.6
More than 1200	7	2.1	5.8
Total	121	36.3	100.0

17.h Annual yield of bananas (in kg)	Frequency	Percent	Valid Percent
60.00	3	.9	5.5
90.00	3	.9	5.5
120.00	1	.3	1.8
150.00	8	2.4	14.5
180.00	2	.6	3.6
210.00	1	.3	1.8
300.00	11	3.3	20.0
450.00	2	.6	3.6
600.00	5	1.5	9.1
750.00	1	.3	1.8
900.00	4	1.2	7.3
1080.00	1	.3	1.8
1200.00	2	.6	3.6
1350.00	2	.6	3.6
1500.00	1	.3	1.8
1800.00	3	.9	5.5
2160.00	2	.6	3.6
3000.00	3	.9	5.5
Total	55	16.5	100.0

17.i Annual yield of pigeon peas (in kg)	Frequency	Percent	Valid Percent
.86	1	.3	1.8
6.88	2	.6	3.6
12.20	1	.3	1.8
17.20	7	2.1	12.7
20.64	1	.3	1.8
24.00	1	.3	1.8
27.52	1	.3	1.8
34.40	10	3.0	18.2
51.60	5	1.5	9.1
68.80	9	2.7	16.4
86.00	4	1.2	7.3
100.00	1	.3	1.8
103.20	1	.3	1.8
103.20	1	.3	1.8
120.40	1	.3	1.8
137.60	2	.6	3.6
172.00	1	.3	1.8
189.20	1	.3	1.8
258.00	1	.3	1.8
275.20	2	.6	3.6
309.60	1	.3	1.8
344.00	1	.3	1.8
Total	55	16.5	100.0

17.j Annual yield of cow peas (in kg)	Frequency	Percent	Valid Percent
2.44	1	.3	6.7
7.32	1	.3	6.7
12.20	4	1.2	26.7
17.08	1	.3	6.7
24.40	1	.3	6.7
36.60	4	1.2	26.7
48.40	1	.3	6.7
85.40	1	.3	6.7
100.00	1	.3	6.7
Total	15	4.5	100.0

17.k Statistics on Annual yields in kg - PROJECT PARTICIPANTS	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	56	20	32	42	14	9	16	8
N Missing	2	38	26	16	44	49	42	50
Mean	409.1214	408.7000	230.0188	231.9048	561.1429	706.6667	111.8000	35.0250
Median	212.8000	192.0000	123.5000	180.0000	320.0000	600.0000	77.4000	36.6000
Minimum	7.60	48.00	7.60	30.00	48.00	90.00	17.20	7.32
Maximum	3724.00	3264.00	1330.00	870.00	1920.00	2160.00	275.20	85.40
Sum	22910.80	8174.00	7360.60	9740.00	7856.00	6360.00	1788.80	280.20

17.l Statistics on Annual yields in kg – NON PARTICIPANTS	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	233	78	76	156	107	46	39	7
N Missing	42	197	199	119	168	229	236	268
Mean	171.3761	159.5846	146.3237	131.3333	372.0748	737.6087	64.6405	28.5771
Median	121.6000	112.0000	95.0000	90.0000	288.0000	300.0000	34.4000	12.2000
Minimum	6.08	3.20	3.80	3.00	32.00	60.00	.86	2.44
Maximum	1596.00	672.00	1064.00	900.00	1600.00	3000.00	344.00	100.00
Sum	39930.64	12447.60	11120.60	20488.00	39812.00	33930.00	2520.98	200.04

17.m Statistics on Annual yields in kg – KOLERO	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	61	25	18	40	23	4	18	2
N Missing	11	47	54	32	49	68	54	70
Mean	164.3108	168.4160	115.3667	187.2000	454.4348	247.5000	45.4544	68.3000
Median	91.2000	112.0000	57.0000	112.5000	200.0000	240.0000	34.4000	68.3000
Minimum	9.12	6.40	7.60	3.00	48.00	60.00	.86	36.60
Maximum	729.60	672.00	684.00	700.00	1920.00	450.00	137.60	100.00
Sum	10022.96	4210.40	2076.60	7488.00	10452.00	990.00	818.18	136.60

17.n Statistics on Annual yields in kg – KASSANGA	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	46	5	2	46	30	21	10	1
N Missing	18	59	62	18	34	43	54	63
Mean	137.3287	121.6000	66.5000	147.7174	413.3333	721.4286	84.9680	2.4400
Median	76.0000	128.0000	66.5000	90.0000	240.0000	300.0000	43.0000	2.4400
Minimum	6.08	16.00	19.00	15.00	32.00	60.00	6.88	2.44
Maximum	851.20	288.00	114.00	900.00	1280.00	3000.00	344.00	2.44
Sum	6317.12	608.00	133.00	6795.00	12400.00	15150.00	849.68	2.44

17.o Statistics on Annual yields in kg – BALANI	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	60	22	22	47	35	7	2	1
N Missing	9	47	47	22	34	62	67	68
Mean	164.1600	150.9091	130.9273	114.2553	344.6857	762.8571	17.2000	7.3200
Median	152.0000	120.0000	76.0000	90.0000	320.0000	300.0000	17.2000	7.3200
Minimum	15.20	16.00	11.40	30.00	32.00	90.00	17.20	7.32
Maximum	729.60	480.00	570.00	300.00	1600.00	2160.00	17.20	7.32
Sum	9849.60	3320.00	2880.40	5370.00	12064.00	5340.00	34.40	7.32

17.p Statistics on Annual yields in kg – MLANGANO	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	60	30	49	30	10	9	19	10
N Missing	4	34	15	34	54	55	45	54
Mean	455.3667	324.9067	226.9143	212.5000	294.4000	800.0000	92.8800	32.1680
Median	212.8000	136.0000	114.0000	180.0000	320.0000	600.0000	68.8000	30.5000
Minimum	7.60	3.20	3.80	15.00	112.00	150.00	6.88	12.20
Maximum	3724.00	3264.00	1330.00	870.00	640.00	3000.00	275.20	85.40
Sum	27322.00	9747.20	11118.80	6375.00	2944.00	7200.00	1764.72	321.68

17.q Statistics on Annual yields in kg – KIZAGILA	Maize	Sorghum	Sesame	Paddy	Cassava	Bananas	Pigeon	Cow peas
N Valid	62	16	17	35	23	14	6	1
N Missing	2	48	47	29	41	50	58	63
Mean	150.4800	171.0000	133.6706	120.0000	426.4348	829.2857	140.4667	12.2000
Median	152.0000	160.0000	133.0000	90.0000	320.0000	300.0000	68.8000	12.2000
Minimum	15.20	16.00	11.40	30.00	64.00	150.00	68.80	12.20
Maximum	729.60	384.00	380.00	300.00	1600.00	2160.00	309.60	12.20
Sum	9329.76	2736.00	2272.40	4200.00	9808.00	11610.00	842.80	12.20

17.r Goods being sold	Frequency	Valid Percent
Beans	10	1.3
Maize	111	14.4
Sorghum	67	8.7
Banana	61	7.9
Sesame	100	13.0
Cassava	118	15.3
Paddy	57	7.4
Coconut	1	.1
Sugar cane	1	.1
Groundnuts	11	1.4
Sweet potatoes	1	.1
Cow peas	10	1.3
Pigeon peas	36	4.7
Pumkins	1	.1
Tomatoes	5	.6
Jack fruits	3	.4
Pineapples	1	.1
Orange tree	1	.1
Cassava flour	1	.1
Vegetables	8	1.0
Pigs	25	3.2
Goats	22	2.9
Chicken	102	13.2
Eggs	18	2.3
Total	771	100.0

17.s All annual revenue from sold goods in TSH	Statistics
N Valid	304
N Missing	29
Mean	195779.8520
Median	133500.0000
Minimum	25.00
Maximum	1735000.00
Sum	59517075.00

17.t All annual revenue from sold goods in TSH (grouped)	Frequency	Percent	Valid Percent
Up to 25000	36	10.8	11.8
25001 to 50000	28	8.4	9.2
50001 to 100000	64	19.2	21.1
100001 to 200000	78	23.4	25.7
200001 to 300000	41	12.3	13.5
300001 to 500000	33	9.9	10.9
More than 500000	24	7.2	7.9
Total	304	91.3	100.0

17.u All annual revenue from sold goods in TSH	PROJECT PARTICIPANTS	NON-PARTICIPANTS
N Valid	56	248
N Missing	2	27
Mean	307553.1250	170540.7258
Median	178000.0000	117750.0000
Minimum	25.00	2000.00
Maximum	1735000.00	1039000.00
Sum	17222975.00	42294100.00

17.v All annual revenue from sold goods in TSH (grouped) – PROJECT PARTICIPANTS	Frequency	Percent	Valid Percent
Up to 25000	5	8.6	8.9
25001 to 50000	2	3.4	3.6
50001 to 100000	9	15.5	16.1
100001 to 200000	13	22.4	23.2
200001 to 300000	8	13.8	14.3
300001 to 500000	7	12.1	12.5
More than 500000	12	20.7	21.4
Total	56	96.6	100.0

17.w All annual revenue from sold goods in TSH (grouped) – NON-PARTICIPANTS	Frequency	Percent	Valid Percent
Up to 25000	31	11.3	12.5
25001 to 50000	26	9.5	10.5
50001 to 100000	55	20.0	22.2
100001 to 200000	65	23.6	26.2
200001 to 300000	33	12.0	13.3
300001 to 500000	26	9.5	10.5
More than 500000	12	4.4	4.8
Total	248	90.2	100.0

17.x All annual revenue from sold goods in TSH	KOLERO	KASANGA	BALANI	MLANGANO	KIZAGILA
N Valid	60	59	62	62	61
N Missing	12	5	7	2	3
Mean	147075.4167	157395.7627	168354.8387	316833.8710	185647.5410
Median	89000.0000	104000.0000	136250.0000	196000.0000	146000.0000
Minimum	25.00	12500.00	5750.00	16500.00	20000.00
Maximum	915000.00	625000.00	866000.00	1735000.00	866000.00
Sum	8824525.00	9286350.00	10438000.00	19643700.00	11324500.00

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18.a Using any irrigation	Frequency	Percent	Valid Percent
Yes	20	6.0	6.0
No	313	94.0	94.0
Total	333	100.0	100.0

14 households are using water from rivers, one from wells and one from dams.

18.b All problems regarding irrigation	Frequency	Valid Percent
Shortage of water	6	33.3
Lack of equipment	7	38.9
Pests	2	11.1
Seasonal water sources	1	5.6
Invasion of animals	1	5.6
Don't know	1	5.6
Total	18	100.0

Q19

19.a Plant or protect tress	Frequency	Percent	Valid Percent
Yes	42	12.6	12.6
No	291	87.4	87.4
Total	333	100.0	100.0

19.b All planted trees	Frequency	Valid Percent
Indigenous Tree	30	51.7
Mango tree	4	6.9
Coconut tree	4	6.9
Orange tree	4	6.9
Jack fruits	4	6.9
Oil palm	2	3.4
Pine tree	1	1.7
Mahogany	9	15.5
Total	58	100.0

Several households of overall 42 households planted more than just one type of tree.

19.c All planted indigenous trees	Frequency	Valid Percent
Mibiriti	1	3.4
Misedelea	16	55.2
Misimbulanga	3	10.3
Mkangazi	5	17.2
Mwiza	1	3.4
Msanbari	2	6.9
Mitalawanda	1	3.4
Total	29	100.0

19.d Number of all planted trees	Statistics
N Valid	38
N Missing	295
Mean	30.8947
Median	10.5000
Minimum	1.00
Maximum	300.00
Sum	1174.00

19.e Number of all planted trees	Frequency	Percent	Valid Percent
Up to 2	4	1.2	10.5
2 to 5	5	1.5	13.2
6 to 10	10	3.0	26.3
11 to 25	7	2.1	18.4
26 to 50	9	2.7	23.7
More than 50	3	.9	7.9
Total	38	11.4	100.0

19.f Locations of all planted trees	Frequency	Valid Percent
Own land	43	76.8
Rented land	2	3.6
Clan-based land	3	5.4
Communal land	8	14.3
Total	56	100.0

19.g All protected trees	Frequency	Valid Percent
Indigenous Tree	5	35.7
Mango tree	3	21.4
Coconut tree	1	7.1
Orange tree	1	7.1
Jack fruits	1	7.1
Oil palm	2	14.3
Mahogany	1	7.1
Total	14	100.0

All trees were protected on own land.

19.h All protected indigenous trees	Frequency	Valid Percent
Misedelea	1	20.0
Msanbari	1	20.0
Mtunge	1	20.0
Margosa	1	20.0
Misegerca	1	20.0
Total	5	100.0

19.i Number of all protected trees	Statistics
N Valid	6
N Missing	327
Mean	19.0000
Median	14.0000
Minimum	1.00
Maximum	53.00
Sum	114.00

19.j Number of all protected trees	Frequency	Percent	Valid Percent
1.00	1	.3	16.7
3.00	1	.3	16.7
10.00	1	.3	16.7
18.00	1	.3	16.7
29.00	1	.3	16.7
53.00	1	.3	16.7
Total	6	1.8	100.0

Q20

20. Statistics on livestock	1. Number of owned pigs	2. Number of owned goats	3. Number of owned chicken	4. Number of owned ducks	5. Number of guinea pigs	6. Number of other owned animals
N Valid	67	63	236	0	2	0
N Missing	266	270	97	333	331	333
Mean	2.46	6.38	11.88		17.00	
Median	2.00	4.00	8.00		17.00	
Minimum	1	1	1		4	
Maximum	10	68	70		30	
Sum	165	402	2804		34	

20.a Number of owned pigs	Frequency	Percent	Valid Percent
1	33	9.9	49.3
2	13	3.9	19.4
3	8	2.4	11.9
4	5	1.5	7.5
5	1	.3	1.5
6	2	.6	3.0
7	1	.3	1.5
8	1	.3	1.5
10	3	.9	4.5
Total	67	20.1	100.0

20.b Number of owned goats	Frequency	Percent	Valid Percent
1	9	2.7	14.3
2	11	3.3	17.5
3	8	2.4	12.7
4	11	3.3	17.5
5	5	1.5	7.9
6	3	.9	4.8
7	4	1.2	6.3
8	1	.3	1.6
9	2	.6	3.2
10	2	.6	3.2
11	2	.6	3.2
13	2	.6	3.2
30	1	.3	1.6
40	1	.3	1.6
68	1	.3	1.6
Total	63	18.9	100.0

20.c Number of owned chicken (grouped)	Frequency	Percent	Valid Percent
Up to 2	19	5.7	8.1
3 to 5	66	19.8	28.0
6 to 7	28	8.4	11.9
8 to 10	42	12.6	17.8
11 to 15	29	8.7	12.3
16 to 20	22	6.6	9.3
21 to 30	17	5.1	7.2
More than 31	13	3.9	5.5
Total	236	70.9	100.0

No household owns ducks.

20.d Number of guinea pigs	Frequency	Percent	Valid Percent
4	1	.3	50.0
30	1	.3	50.0
Total	2	.6	100.0

No household owns other animals.

Q21

21.a Any knowledge on conservation agriculture	Frequency	Percent	Valid Percent
Yes	74	22.2	22.2
No	259	77.8	77.8
Total	333	100.0	100.0

21.b All descriptions of CA	Frequency	Valid Percent
Avoid slash and burn	7	7.1
Double digging	15	15.3
Conserve environment	17	17.3
Minimum/no soil disturbance	4	4.1
Good farming practice	5	5.1
Conserve soil fertility	3	3.1
Modern farming	8	8.2
Planting in rows	25	25.5
Mulching	5	5.1
Avoid erosion	2	2.0
Intercropping	5	5.1
Quality seeds	1	1.0
Avoid deforestation	1	1.0
Total	98	100.0

Q22

22.a CA techniques (1)	1. Double digging		2. Mulching		3. Avoid slash and burn		4. Crop rotation		5. Planting in rows		6. Planting hedge rows	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	47	14.1	59	17.7	67	20.1	38	11.4	75	22.5	34	10.2
No	286	85.9	274	82.3	266	79.9	295	88.6	258	77.5	299	89.8
Total	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0	333	100.0

22.b CA techniques (2)	7. Planting crop cover		8. No/minimum tillage		9. Intercropping		10. Ridge cultivation		11. Direct seeding	
	N	%	N	%	N	%	N	%	N	%
Yes	33	9.9	44	13.2	56	16.8	16	4.8	34	10.2
No	300	90.1	289	86.8	277	83.2	316	95.2	299	89.8
Total	333	100.0	333	100.0	333	100.0	332	100.0	333	100.0

22.c CA techniques (1) PROJECT PARTICIPANTS	1. Double digging		2. Mulching		3. Avoid slash and burn		4. Crop rotation		5. Planting in rows		6. Planting hedge rows	
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	41	70.7	41	70.7	46	79.3	27	46.6	49	84.5	27	46.6
No	17	29.3	17	29.3	12	20.7	31	53.4	9	15.5	31	53.4
Total	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0	58	100.0

22.d CA techniques (2) PROJECT PARTICIPANTS	7. Planting crop cover		8. No/minimum tillage		9. Intercropping		10. Ridge cultivation		11. Direct seeding	
	N	%	N	%	N	%	N	%	N	%
Yes	29	50.0	36	62.1	33	56.9	14	24.6	22	37.9
No	29	50.0	22	37.9	25	43.1	43	75.4	36	62.1
Total	58	100.0	58	100.0	58	100.0	57	100.0	58	100.0

Q23

23. All techniques that have benefited productivity	Frequency	Valid Percent
Double digging	33	23.2
Mulching	22	15.5
Avoid slash and burn	16	11.3
Crop rotation	5	3.5
Planting in rows	36	25.4
Planting Hedge rows	3	2.1
Crop cover	9	6.3
Intercropping	10	7.0
NO/minimum tillage	4	2.8
Ridge cultivation	3	2.1
Direct seeding	1	.7
Total	142	100.0

Q24

24.a Who decided to use CA techniques?	Frequency	Percent	Valid Percent
Man	31	9.3	41.9
Woman	24	7.2	32.4
Man and Woman	17	5.1	23.0
Family	1	.3	1.4
Nobody	1	.3	1.4
Total	74	22.2	100.0

24.b All reasons for CA	Frequency	Valid Percent
After training	16	22.2
Learned/saw from others	7	9.7
Higher yields	31	43.1
Food security	1	1.4
Increase income	7	9.7
Environmental conservation	2	2.8
Change agriculture	8	11.1
Total	72	100.0

Q25

25.a Any initial investment made when joining the project	Frequency	Percent	Valid Percent
Yes	14	4.2	17.7
No	65	19.5	82.3
Total	79	23.7	100.0

12 cases mentioned 'cash' and one case 'labour' as additional investment. Unfortunately the respondents did not specify how they spent the additionally required cash.

25.b Initial amount for type of cost in TSH	Statistics
N Valid	13
N Missing	320
Mean	60769.2308
Median	50000.0000
Minimum	10000.00
Maximum	150000.00
Sum	790000.00

25.c Initial amount for type of cost in TSH	Frequency	Percent	Valid Percent
10000.00	3	.9	23.1
15000.00	1	.3	7.7
20000.00	1	.3	7.7
30000.00	1	.3	7.7
50000.00	2	.6	15.4
65000.00	1	.3	7.7
100000.00	1	.3	7.7
130000.00	1	.3	7.7
150000.00	2	.6	15.4
Total	13	3.9	100.0

Q26

26.a Participation in project resulted in additional costs regularly	Frequency	Percent	Valid Percent
Yes	42	12.6	52.5
No	38	11.4	47.5
Total	80	24.0	100.0

26.b Additional regular costs (annually, in TSH)	1. Labour	2. Equipment	3. Resources (seeds, manure...)	4. Additional time in hours per year	5. Agrochemicals	6. All regular additional costs
N Valid	30	27	10	9	1	41
N Missing	303	306	323	324	332	292
Mean	41633.3333	34059.2593	39950.0000	375.2222	2000.0000	62685.3659
Median	22000.0000	10000.0000	13000.0000	576.0000	2000.0000	25000.0000
Minimum	2000.00	1200.00	3000.00	4.00	2000.00	1200.00
Maximum	200000.00	320000.00	200000.00	864.00	2000.00	520000.00
Sum	1249000.00	919600.00	399500.00	3377.00	2000.00	2570100.00

26.c Amount in TSH for additional cost for labour	Frequency	Percent	Valid Percent
2000.00	1	.3	3.3
3000.00	1	.3	3.3
10000.00	2	.6	6.7
15000.00	6	1.8	20.0
20000.00	5	1.5	16.7
24000.00	1	.3	3.3
25000.00	3	.9	10.0
50000.00	3	.9	10.0
55000.00	1	.3	3.3
60000.00	1	.3	3.3
70000.00	1	.3	3.3
100000.00	4	1.2	13.3
200000.00	1	.3	3.3
Total	30	9.0	100.0

26.d Amount in TSH for additional cost for equipment	Frequency	Percent	Valid Percent
1200.00	1	.3	3.7
4000.00	2	.6	7.4
5000.00	2	.6	7.4
8000.00	3	.9	11.1
10000.00	6	1.8	22.2
15000.00	4	1.2	14.8
20000.00	1	.3	3.7
26400.00	1	.3	3.7
30000.00	2	.6	7.4
50000.00	2	.6	7.4
80000.00	1	.3	3.7
150000.00	1	.3	3.7
320000.00	1	.3	3.7
Total	27	8.1	100.0

26.e Amount in TSH for additional cost for resources (seeds, manure...)	Frequency	Percent	Valid Percent
3000.00	3	.9	30.0
4500.00	1	.3	10.0
6000.00	1	.3	10.0
20000.00	1	.3	10.0
30000.00	2	.6	20.0
100000.00	1	.3	10.0
200000.00	1	.3	10.0
Total	10	3.0	100.0

26.f Amount of additional time in hours per year	Frequency	Percent	Valid Percent
4.00	1	.3	11.1
25.00	1	.3	11.1
80.00	1	.3	11.1
100.00	1	.3	11.1
576.00	4	1.2	44.4
864.00	1	.3	11.1
Total	9	2.7	100.0

26.g Amount in TSH for additional cost for agrochemicals	Frequency	Percent	Valid Percent
2000.00	1	.3	100.0
Total	1	.3	100.0

26.h All regular additional costs (in TSH)	Statistics
N Valid	41
N Missing	292
Mean	62685.3659
Median	25000.0000
Minimum	1200.00
Maximum	520000.00
Sum	2570100.00

26.i All regular additional costs (in TSH)	Frequency	Percent	Valid Percent
5001 to 10000	3	.9	7.3
10001 to 20000	6	1.8	14.6
20001 to 25000	7	2.1	17.1
25001 to 50000	5	1.5	12.2
50001 to 100000	4	1.2	9.8
100001 to 150001	9	2.7	22.0
More than 150000	7	2.1	17.1
Total	41	12.3	100.0

Q27

27.a Benefits or Disadvantage from using CA	Frequency	Percent	Valid Percent
More benefits	61	18.3	78.2
More disadvantages	3	.9	3.8
Even/balanced	14	4.2	17.9
Total	78	23.4	100.0

27.b All mentioned benefits due to CA	Frequency	Valid Percent
Higher yields	69	68.3
Small land/high yields	1	1.0
Increase in income	10	9.9
Food security	5	5.0
Increase in soil fertility	6	5.9
Conserve environment	5	5.0
Avoid erosion	2	2.0
Control diseases	1	1.0
Gain knowledge	1	1.0
Reduce labor costs	1	1.0
Total	101	100.0

27.c Main disadvantage experienced	Frequency	Percent	Valid Percent
Increased costs	5	1.5	25.0
No immediate profit	1	.3	5.0
Unsatisfactory yield	3	.9	15.0
Time consuming	11	3.3	55.0
Total	20	6.0	100.0

Q28

28.a Increase in income due to CA in last 12 months	Frequency	Percent	Valid Percent
Yes	49	14.7	70.0
No	21	6.3	30.0
Total	70	21.0	100.0

28.b All types of additional income due to CA in last 12 months	Frequency	Valid Percent
Beans	1	1.4
Maize	31	44.9
Sorghum	7	10.1
Banana	1	1.4
Sesame	13	18.8
Cassava	2	2.9
Paddy	10	14.5
Sweet potatoes	1	1.4
Pigeon peas	3	4.3
Total	69	100.0

28.c All additional income in TSH in last 12 months due to CA	Statistics
N Valid	47
N Missing	286
Mean	141046.8085
Median	90000.0000
Minimum	5000.00
Maximum	800000.00
Sum	6629200.00

28.d All additional income in TSH in last 12 months due to CA	Frequency	Percent	Valid Percent
Up to 15000	7	2.1	14.9
15001 to 25000	6	1.8	12.8
25001 to 50000	7	2.1	14.9
50001 to 100000	7	2.1	14.9
100001 to 200000	10	3.0	21.3
200001 to 400000	6	1.8	12.8
More than 400001	4	1.2	8.5
Total	47	14.1	100.0

28.e Type of business started in last 12 months	Frequency	Percent	Valid Percent
Restaurant/cooking	5	1.5	25.0
Selling crops	7	2.1	35.0
Petty trade	3	.9	15.0
Shop	3	.9	15.0
Selling baskets	1	.3	5.0
Selling local brew	1	.3	5.0
Total	20	6.0	100.0

Q29

29.a Assessment of agriculture	Frequency	Percent	Valid Percent
Very satisfied, no problems	6	1.8	2.4
Almost always satisfied, some problems	72	21.6	28.6
Number of problems, mainly satisfied	48	14.4	19.0
Lot of problems, not satisfied	126	37.8	50.0
Total	252	75.7	100.0

29.b Problems regarding agriculture	Frequency	Valid Percent
Diseases	83	20.8
Crops dry	13	3.3
Prolonged dry season	29	7.3
High temperatures	5	1.3
Cold temperatures	2	.5
Lack of equipment/implements	30	7.5
Lack of seeds	3	.8
Lack of finances	10	2.5
Lack of labor	5	1.3
Lack of land	14	3.5
Low rainfall	36	9.0
Unpredictable rainfall	13	3.3
Low yield	122	30.6
Poor soil fertility	5	1.3
Shortage of food	1	.3
Soil erosion	4	1.0
Difficult terrain	4	1.0
Invasion of animals	14	3.5
Lack of knowledge	1	.3
More rain/floods	2	.5
Lack of market	2	.5
Lack of water	1	.3
Total	399	100.0

Q30

30. Heard of CA	Frequency	Percent	Valid Percent
Yes	115	34.5	45.6
No	137	41.1	54.4
Total	252	75.7	100.0

Q31

31.a All reasons for not joining the project	Frequency	Valid Percent
High costs	4	1.8
Lack of training (CA)	83	38.1
Lack of knowledge about project	81	37.2
Difficult to practice/adopt	5	2.3
Lack of finances	3	1.4
Lack of enough labor	19	8.7
Lack of motivation	1	.5
Lack of time	12	5.5
Lack of land	6	2.8
No need	1	.5
Used to other techniques	3	1.4
Total	218	100.0

31.b Who made decision not to use CA	Frequency	Percent	Valid Percent
Man	72	21.6	53.7
Woman	35	10.5	26.1
Man and woman	5	1.5	3.7
Nobody	22	6.6	16.4
Total	134	40.2	100.0

Q32

32. Requirements to join project	1. More training		2. Lower costs of initial investment		3. Less maintenance costs		4. More labor force		5. More equipment		6. See good examples		7. More immediate benefit/revenue		8. More assistance from a project	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Yes	234	93.6	131	52.2	66	26.3	111	44.6	133	53.0	131	52.2	71	28.3	136	54.2
No	16	6.4	120	47.8	185	73.7	138	55.4	118	47.0	120	47.8	180	71.7	115	45.8
Total	250	100.0	251	100.0	251	100.0	249	100.0	251	100.0	251	100.0	251	100.0	251	100.0

Q33

33.a Possible monetary investment (in TSH)	Statistics
N Valid	232
N Missing	101
Mean	30743.5345
Median	20000.0000
Minimum	1000.00
Maximum	300000.00
Sum	7132500.00

33.b Possible monetary investment (in TSH)	Frequency	Percent	Valid Percent
Up to 5000	25	7.5	10.8
5001 to 10000	45	13.5	19.4
10001 to 20000	59	17.7	25.4
20001 to 30000	34	10.2	14.7
30001 to 50000	46	13.8	19.8
50001 to 70000	11	3.3	4.7
More than 70000	12	3.6	5.2
Total	232	69.7	100.0

33.c Possible timely investment (h/week)	Statistics
N Valid	225
N Missing	108
Mean	9.9489
Median	6.0000
Minimum	.50
Maximum	56.00
Sum	2238.50

33.d Possible timely investment (h/week)	Frequency	Percent	Valid Percent
Up to 2	29	8.7	12.9
3 to 4	33	9.9	14.7
4 to 6	52	15.6	23.1
6 to 8	23	6.9	10.2
9 to 10	18	5.4	8.0
11 to 20	37	11.1	16.4
More than 20	33	9.9	14.7
Total	225	67.6	100.0

Q34

34.a All mentioned markets	Frequency	Valid Percent
Bwakila	2	.4
Dutumi	51	9.6
Kasanga	9	1.7
Kitonga	2	.4
Kolero	172	32.4
Matombo	37	7.0
Mvuha	114	21.5
Kisanzala	1	.2
Lukanga	2	.4
Mtomboli	2	.4
Home	139	26.2
Total	531	100.0

307 households sell at least at one market, 169 respondents selling on 2 markets, 52 on 3 and 3 on 4 markets.

34.b All goods sold at first market	Frequency	Valid Percent
beans	7	1.5
maize	76	15.8
sorghum	38	7.9
banana	51	10.6
simsim	65	13.5
cassava	87	18.1
paddy	43	8.9
coconut	1	.2
sugar cane	1	.2
groundnuts	5	1.0
sweet potatoes	1	.2
cowpeas	6	1.2
pigeon peas	26	5.4
tomatoes	4	.8
jack jfruits	3	.6
pineapple	3	.6
orange tree	2	.4
Cassava flour	5	1.0
Vegetables	4	.8
lablab	1	.2
pigs	8	1.7
goats	5	1.0
chicken	30	6.2
eggs	9	1.9
Total	481	100.0

34.c All goods sold at second market	Frequency	Valid Percent
beans	2	.9
maize	42	18.0
sorghum	24	10.3
banana	20	8.6
simsim	25	10.7
cassava	29	12.4
paddy	15	6.4
groundnuts	8	3.4
cowpeas	1	.4
pigeon peas	5	2.1
tomatoes	1	.4
pineapple	1	.4
Cassava flour	4	1.7
Vegetables	4	1.7
pigs	6	2.6
goats	6	2.6
chicken	34	14.6
eggs	6	2.6
Total	233	100.0

34.d All goods sold at third market	Frequency	Valid Percent
beans	2	3.0
maize	1	1.5
sorghum	2	3.0
banana	5	7.5
simsim	9	13.4
cassava	9	13.4
paddy	2	3.0
cowpeas	1	1.5
pigeon peas	1	1.5
pigs	4	6.0
goats	7	10.4
chicken	22	32.8
eggs	2	3.0
Total	67	100.0

34.e All goods sold at forth market	Frequency	Valid Percent
sorghum	1	14.3
paddy	1	14.3
pigeon peas	1	14.3
pigs	2	28.6
chicken	2	28.6
Total	7	100.0

34.f All goods sold at all markets	Frequency	Valid Percent
beans	11	1.4
maize	119	15.1
sorghum	65	8.2
banana	76	9.6
simsim	99	12.6
cassava	125	15.9
paddy	61	7.7
coconut	1	.1
sugar cane	1	.1
groundnuts	13	1.6
sweet potatoes	1	.1
cowpeas	8	1.0
pigeon peas	33	4.2
tomatoes	5	.6
jack jfruits	3	.4
pineapple	4	.5
orange tree	2	.3
Cassava flour	9	1.1
Vegetables	8	1.0

lablab	1	.1
pigs	20	2.5
goats	18	2.3
chicken	88	11.2
eggs	17	2.2
Total	788	100.0

34.g Frequencies visiting markets	Frequency	Valid Percent
Twice a year	131	25.9
Every three months	43	8.5
Every second month	46	9.1
Monthly	137	27.1
Every second week	37	7.3
Every week	85	16.8
Twice a week	11	2.2
Daily	3	.6
Other	8	1.6
Others	5	1.0
Total	506	100.0

34.h Statistics on distance to markets (in km)	Market 1	Market 2	Market 3	Market 4)
N Valid	137	63	19	2
N Missing	196	270	314	331
Mean	12.6899	20.3016	22.8421	4.5000
Median	6.0000	20.0000	30.0000	4.5000
Minimum	.01	1.00	.50	4.00
Maximum	50.00	50.00	50.00	5.00
Sum	1738.51	1279.00	434.00	9.00

8 mention a distance of 0km to market 1 (home), 8 mention a distance of 0km to market 2 (home), 2 mention a distance of 0km to market 3 (home),

34.i Distance both ways to all markets (km)	Statistics
N Valid	147
N Missing	186
Mean	23.5409
Median	14.0000
Minimum	.01
Maximum	98.00
Sum	3460.51

34.j Distance both ways to all markets (km)	Frequency	Percent	Valid Percent
Up to 0.5	21	6.3	14.3
0.6 to 2.5	19	5.7	12.9
2.6 to 5	6	1.8	4.1
6 to 10	23	6.9	15.6
11 to 20	18	5.4	12.2
21 to 40	27	8.1	18.4
41 to 60	19	5.7	12.9
More than 60	14	4.2	9.5
Total	147	44.1	100.0

34.k All times required to go to market (in hrs)	Frequency	Valid Percent
1.00	2	1.3
1.50	6	3.9
2.00	14	9.2
2.50	7	4.6
3.00	34	22.4
4.00	22	14.5
4.50	1	.7
5.00	10	6.6
6.00	29	19.1
7.00	1	.7
8.00	15	9.9
10.00	1	.7
12.00	2	1.3
20.00	1	.7
120.00	1	.7
240.00	2	1.3
360.00	4	2.6
Total	152	100.0

Mean value would be 158h, median 4h

34.l All modes of transport	Frequency	Valid Percent
Foot	398	98.3
Bicycle	5	1.2
Other farmer (by foot)	2	.5
Total	405	100.0

Distances covered by bicycle 6-10km (2 cases), 11-20km (1 case), and more than 60km (2 cases)

Only two respondents mention to pay for going to the markets: 1500TSH and 6000 TSH. Those are the same two cases that transport goods with another farmer.

Q35

35.a Hired staff/laborer	Frequency	Percent	Valid Percent
Yes	69	20.7	20.8
No	263	79.0	79.2
Total	332	99.7	100.0

No permanent female or male worker was hired by any farm.

35.b Number of hired casual female staff	Statistics
N Valid	61
N Missing	272
Mean	5.2131
Median	4.0000
Minimum	1.00
Maximum	28.00
Sum	318.00

35.c Number of hired casual female staff	Frequency	Percent	Valid Percent
1.00	6	1.8	9.8
2.00	9	2.7	14.8
3.00	11	3.3	18.0
4.00	17	5.1	27.9
5.00	2	.6	3.3
6.00	5	1.5	8.2
7.00	1	.3	1.6
8.00	1	.3	1.6
10.00	2	.6	3.3
12.00	2	.6	3.3
15.00	2	.6	3.3
18.00	2	.6	3.3
28.00	1	.3	1.6
Total	61	18.3	100.0

35.d Task of hired casual female staff	Frequency	Percent	Valid Percent
Tilling	30	9.0	49.2
Double digging	2	.6	3.3
Slashing	2	.6	3.3
Weeding	24	7.2	39.3
Tilling & weeding	1	.3	1.6
Cultivating	2	.6	3.3
Total	61	18.3	100.0

35.e Number of hired casual male staff	Statistics
N Valid	48
N Missing	285
Mean	5.7292
Median	3.5000
Minimum	1.00
Maximum	28.00
Sum	275.00

35.f Number of hired casual male staff	Frequency	Percent	Valid Percent
1.00	4	1.2	8.3
2.00	4	1.2	8.3
3.00	16	4.8	33.3
4.00	2	.6	4.2
5.00	6	1.8	12.5
6.00	5	1.5	10.4
7.00	1	.3	2.1
8.00	1	.3	2.1
10.00	2	.6	4.2
12.00	2	.6	4.2
15.00	4	1.2	8.3
28.00	1	.3	2.1
Total	48	14.4	100.0

35.g Task of hired casual male staff	Frequency	Percent	Valid Percent
Tilling	29	8.7	59.2
Double digging	1	.3	2.0
Slashing	7	2.1	14.3
Weeding	8	2.4	16.3
Prepare farm	2	.6	4.1
Cultivating	1	.3	2.0
Harvesting	1	.3	2.0
Total	49	14.7	100.0

One household hired for three man days girls less than 14 years for weeding and cultivating.
One household hired for four man days boys less than 14 years for slashing.

Q36

36.a Able to provide food for family	Frequency	Percent	Valid Percent
Yes	131	39.3	39.5
Sometimes	198	59.5	59.6
Never	3	.9	.9
Total	332	99.7	100.0

36.b Months able to provide food	Frequency	Percent	Valid Percent
1-3 months per year	31	9.3	9.4
Up to 6 months per year	105	31.5	31.9
Up to 9 months per year	57	17.1	17.3
The whole year	103	30.9	31.3
Even more than a year	6	1.8	1.8
Could not provide for family back then	6	1.8	1.8
Very irregular	21	6.3	6.4
Total	329	98.8	100.0

Q37

37.a Heard the term Climate Change	Frequency	Percent	Valid Percent
Yes	232	69.7	72.3
No	89	26.7	27.7
Total	321	96.4	100.0

37.b Climate change explanation (1)	Frequency	Percent	Valid Percent
Changes in weather	2	.6	.8
Changes in seasons	11	3.3	4.6
Changes in rainy season	34	10.2	14.2
Unpredictable rains	13	3.9	5.4
Prolonged dry season	81	24.3	33.9
Less rain in dry season	4	1.2	1.7
Less rain in rainy season	29	8.7	12.1
Less rain	15	4.5	6.3
More rain in rain season	5	1.5	2.1
More rain in dry season	2	.6	.8
More rain	7	2.1	2.9
Lack of water	1	.3	.4
Higher temperature	30	9.0	12.6
Lower temperature	3	.9	1.3
Other	2	.6	.8
Total	239	71.8	100.0

37.c Climate change explanation (2)	Frequency	Percent	Valid Percent
Changes in rainy season	5	1.5	6.1
Unpredictable rains	1	.3	1.2
Prolonged dry season	8	2.4	9.8
Less rain in rainy season	16	4.8	19.5
Less rain	3	.9	3.7
More rain in rain season	23	6.9	28.0
More rain in dry season	5	1.5	6.1
More rain	5	1.5	6.1
Floods	5	1.5	6.1
Changes in temperature	1	.3	1.2
Higher temperature	10	3.0	12.2
Total	82	24.6	100.0

37.d All explanations of climate change	Frequency	Valid Percent
Changes in weather	2	.6
Changes in seasons	11	3.4
Changes in rainy season	39	12.1
Unpredictable rains	14	4.4
Prolonged dry season	89	27.7
Less rain in dry season	4	1.2
Less rain in rainy season	45	14.0
Less rain	18	5.6
More rain in rain season	28	8.7
More rain in dry season	7	2.2
More rain	12	3.7
Floods	5	1.6
Lack of water	1	.3
Changes in temperature	1	.3
Higher temperature	40	12.5
Lower temperature	3	.9
Other	2	.6
Total	321	100.0

37.e Possible explanation of Climate change (1)	Frequency	Percent	Valid Percent
Changes in weather	3	.9	7.5
Changes in seasons	3	.9	7.5
Changes in rainy season	8	2.4	20.0
Prolonged dry season	7	2.1	17.5
Less rain in rainy season	8	2.4	20.0
Less rain	4	1.2	10.0
More rain in rain season	1	.3	2.5
Changes in temperature	1	.3	2.5
Higher temperature	3	.9	7.5
Other	2	.6	5.0
Total	40	12.0	100.0

37.f Possible explanation of Climate change (2)	Frequency	Percent	Valid Percent
Prolonged dry season	1	.3	14.3
Less rain in rainy season	3	.9	42.9
Less rain	1	.3	14.3
More rain in rain season	1	.3	14.3
Higher temperature	1	.3	14.3
Total	7	2.1	100.0

37.g All possible explanations of climate change	Frequency	Valid Percent
Changes in weather	3	6.3
Changes in seasons	4	8.3
Changes in rainy season	8	16.7
Prolonged dry season	8	16.7
Less rain in rainy season	11	22.9
Less rain	5	10.4
More rain in rain season	2	4.2
Changes in temperature	1	2.1
Higher temperature	4	8.3
Other	2	4.2
Total	48	100.0

Q38

38.a Most striking change in climate observed	Frequency	Percent	Valid Percent
Nothing	20	6.0	6.5
More rainfall	20	6.0	6.5
Less rainfall	121	36.3	39.0
More floods	8	2.4	2.6
Dry season much longer	137	41.1	44.2
Other	4	1.2	1.3
Total	310	93.1	100.0

38.b First impact of climate change on family	Frequency	Percent	Valid Percent
Increased household expenditures	1	.3	.3
Dried crops	6	1.8	2.1
Destruction of crops	5	1.5	1.7
Low yields	7	2.1	2.4
Destruction of house	9	2.7	3.1
Diseases	9	2.7	3.1
Shortage of food	236	70.9	82.2
Lack of safe water	6	1.8	2.1
Destruction of food storage	2	.6	.7
Floods	2	.6	.7
Other	1	.3	.3
None	3	.9	1.0
Total	287	86.2	100.0

38.c Second impact of climate change on family	Frequency	Percent	Valid Percent
Increased household expenditures	6	1.8	14.0
Destruction of crops	1	.3	2.3
Low yields	2	.6	4.7
Destruction of house	2	.6	4.7
Diseases	13	3.9	30.2
Shortage of food	7	2.1	16.3
Lack of safe water	12	3.6	27.9
Total	43	12.9	100.0

38.d All mentioned impact of climate change on family	Frequency	Valid Percent
Increased household expenditures	7	2.1
Dried crops	6	1.8
Destruction of crops	6	1.8
Low yields	9	2.7
Destruction of house	11	3.3
Diseases	22	6.7
Shortage of food	243	73.6
Lack of safe water	18	5.5
Destruction of food storage	2	.6
Floods	2	.6
Other	1	.3
None	3	.9
Total	330	100.0

38.e First impact of climate change on livestock/agriculture	Frequency	Percent	Valid Percent
Livestock diseases	5	1.5	1.8
Crop diseases	3	.9	1.1
Increased hh expenditures	1	.3	.4
Lower yields	73	21.9	25.9
Crops dry	125	37.5	44.3
Destruction/death of crops	28	8.4	9.9
Land degradation	3	.9	1.1
Lack of land	1	.3	.4
Shortage of safe water	2	.6	.7
Shortage of food/fodder	1	.3	.4
Livestock dies	24	7.2	8.5
Diseases	11	3.3	3.9
Prolonged dry season	3	.9	1.1
Other	1	.3	.4
Nothing	1	.3	.4
Total	282	84.7	100.0

38.f Second impact of climate change to livestock/agriculture	Frequency	Percent	Valid Percent
Livestock diseases	11	3.3	20.4
Crop diseases	2	.6	3.7
Lower yields	15	4.5	27.8
Crops dry	6	1.8	11.1
Destruction/death of crops	6	1.8	11.1
Shortage of safe water	1	.3	1.9
Shortage of food/fodder	2	.6	3.7
Livestock dies	8	2.4	14.8
Diseases	2	.6	3.7
Prolonged dry season	1	.3	1.9
Total	54	16.2	100.0

38.g All mentioned impact of climate change on livestock/agriculture	Frequency	Valid Percent
Livestock diseases	16	5.6
Crop diseases	5	1.8
Increased hh expenditures	1	.4
Lower yields	88	31.0
Crops dry	131	46.1
Destruction/death of crops	34	12.0
Land degradation	3	1.1
Lack of land	1	.4
Shortage of safe water	3	1.1
Shortage of food/fodder	3	1.1
Livestock dies	32	11.3
Diseases	13	4.6
Prolonged dry season	4	1.4
Other	1	.4
Nothing	1	.4
Total	336	100.0

38.h First change made on agriculture and livestock	Frequency	Percent	Valid Percent
Adopt CA	12	3.6	4.2
Crop diversification	5	1.5	1.8
Plant cover crops	1	.3	.4
Plant new crops	1	.3	.4
Plant drought resistant crops	14	4.2	4.9
Plant Cassava	34	10.2	12.0
Avoid planting in valley	3	.9	1.1
Change agriculture technique	5	1.5	1.8
Keep (more) livestock	1	.3	.4
Reduce livestock	4	1.2	1.4
Start business	2	.6	.7
Store food	2	.6	.7
Treat livestock	1	.3	.4
Plant hedge rows	1	.3	.4
Other	1	.3	.4
No changes	116	34.8	41.0

Don't know	77	23.1	27.2
Refuse to answer	3	.9	1.1
Total	283	85.0	100.0

38.i Second change made on agriculture and livestock	Frequency	Percent	Valid Percent
Crop diversification	2	.6	50.0
No changes	2	.6	50.0
Total	4	1.2	100.0

38.j All changes made on agriculture and livestock	Frequency	Valid Percent
Adopt CA	12	5.8
Crop diversification	7	3.4
Plant cover crops	1	.5
Plant new crops	1	.5
Plant drought resistant crops	14	6.8
Plant Cassava	34	16.4
Avoid planting in valley	3	1.4
Change agriculture technique	5	2.4
Keep (more) livestock	1	.5
Reduce livestock	4	1.9
Start business	2	1.0
Store food	2	1.0
Treat livestock	1	.5
Plant hedge rows	1	.5
Other	1	.5
No changes	118	57.0
Total	207	100.0

38.k First preparation being done	Frequency	Percent	Valid Percent
Use CA	18	5.4	7.0
Crop diversification	6	1.8	2.3
Plant cover crops	1	.3	.4
Plant more crops	5	1.5	1.9
Plant drought resistant crops	9	2.7	3.5
Plant Cassava	36	10.8	14.0
Avoid planting in valley	3	.9	1.2
Change agriculture technique	16	4.8	6.2
Keep (more) livestock	3	.9	1.2
Start business	7	2.1	2.7
Store food	6	1.8	2.3
Plant hedge rows	1	.3	.4
Safe money	2	.6	.8
Plant trees	7	2.1	2.7
Early planting/harvesting	7	2.1	2.7
Better housing	3	.9	1.2
Irrigation	3	.9	1.2
Other	2	.6	.8
No changes	122	36.6	47.5
Total	257	77.2	100.0

38.l Second preparation being done	Frequency	Percent	Valid Percent
Use CA	1	.3	6.3
Plant Cassava	7	2.1	43.8
Avoid planting in valley	1	.3	6.3
Change agriculture technique	1	.3	6.3
Safe money	1	.3	6.3
Plant trees	1	.3	6.3
Early planting/harvesting	4	1.2	25.0
Total	16	4.8	100.0

38.m All preparations being done	Frequency	Valid Percent
Use CA	19	7.0
Crop diversification	6	2.2
Plant cover crops	1	.4
Plant more crops	5	1.8
Plant drought resistant crops	9	3.3
Plant Cassava	43	15.8
Avoid planting in valley	4	1.5
Change agriculture technique	17	6.2
Keep (more) livestock	3	1.1
Start business	7	2.6
Store food	6	2.2
Plant hedge rows	1	.4
Safe money	3	1.1
Plant trees	8	2.9
Early planting/harvesting	11	4.0
Better housing	3	1.1
Irrigation	3	1.1
Other	2	.7
No changes	122	44.7
Total	273	100.0

Q39

39.a Explanation (1) of slash and burn	Frequency	Percent	Valid Percent
Reduce weed	8	2.4	2.7
Reduce grass	124	37.2	42.3
Clearing & preparing farm	49	14.7	16.7
Cut grass & burn	2	.6	.7
Easy preparation	26	7.8	8.9
Cleaning environment	2	.6	.7
Killings pests & animals	4	1.2	1.4
Farming system	9	2.7	3.1
Reduce trees	4	1.2	1.4
Land destruction	2	.6	.7
Increase soil fertility	3	.9	1.0
Culture/tradition	57	17.1	19.5
Cheap to clear	2	.6	.7
Nothing	1	.3	.3
Total	293	88.0	100.0

39.b Explanation (2) of slash and burn	Frequency	Percent	Valid Percent
Reduce grass	2	.6	40.0
Clearing & preparing farm	1	.3	20.0
Killings pests & animals	1	.3	20.0
Reuse ashes	1	.3	20.0
Total	5	1.5	100.0

39.c All explanations (3) of slash and burn	Frequency	Valid Percent
Reduce weed	8	2.7
Reduce grass	126	42.3
Clearing & preparing farm	50	16.8
Cut grass & burn	2	.7
Easy preparation	26	8.7
Cleaning environment	2	.7
Killings pests & animals	5	1.7
Farming system	9	3.0
Reduce trees	4	1.3
Land destruction	2	.7
Increase soil fertility	3	1.0
Culture/tradition	57	19.1
Cheap to clear	2	.7
Reuse ashes	1	.3
Nothing	1	.3
Total	298	100.0

39.d Reason (1) for slash and burn	Frequency	Percent	Valid Percent
Reduce grass	20	6.0	6.6
Clearing & preparing farm	10	3.0	3.3
Low cost practice	6	1.8	2.0
Saves time	7	2.1	2.3
Easy practice	142	42.6	47.2
Killings pests & animals	52	15.6	17.3
Lack of awareness	13	3.9	4.3
Increased yields	7	2.1	2.3
Reduce trees	4	1.2	1.3
Increase soil fertility	1	.3	.3
Culture/tradition	30	9.0	10.0
Farming system	2	.6	.7
Reuse ashes	7	2.1	2.3
Total	301	90.4	100.0

39.e Reason (2) for slash and burn	Frequency	Percent	Valid Percent
Reduce grass	3	.9	9.4
Clearing & preparing farm	7	2.1	21.9
Low cost practice	2	.6	6.3
Saves time	1	.3	3.1
Easy practice	9	2.7	28.1
Killings pests & animals	8	2.4	25.0
Increase soil fertility	1	.3	3.1
Reuse ashes	1	.3	3.1
Total	32	9.6	100.0

39.f All reasons for slash and burn	Frequency	Valid Percent
Reduce grass	23	6.9
Clearing & preparing farm	17	5.1
Low cost practice	8	2.4
Saves time	8	2.4
Easy practice	151	45.3
Killings pests & animals	60	18.0
Lack of awareness	13	3.9
Increased yields	7	2.1
Reduce trees	4	1.2
Increase soil fertility	2	.6
Culture/tradition	30	9.0
Farming system	2	.6
Reuse ashes	8	2.4
Total	333	100.0

39.g Reason (1) not to give up slash and burn	Frequency	Percent	Valid Percent
Reduce grass	2	.6	.7
Clearing & preparing farm	1	.3	.4
Low cost practice	3	.9	1.1
Saves time	6	1.8	2.1
Easy practice	25	7.5	8.8
Killings pests & animals	14	4.2	4.9
Lack of awareness	84	25.2	29.7
Increased yields	2	.6	.7
Culture/tradition	141	42.3	49.8
Farming system	1	.3	.4

Reuse ashes	2	.6	.7
No CA training	1	.3	.4
Other	1	.3	.4
Total	283	85.0	100.0

39.h Reason (2) not to give up slash and burn	Frequency	Percent	Valid Percent
Low cost practice	1	.3	10.0
Easy practice	1	.3	10.0
Killings pests & animals	3	.9	30.0
Lack of awareness	4	1.2	40.0
Culture/tradition	1	.3	10.0
Total	10	3.0	100.0

39.i All reasons not to give up slash and burn	Frequency	Valid Percent
Reduce grass	2	.7
Clearing & preparing farm	1	.3
Low cost practice	4	1.4
Saves time	6	2.0
Easy practice	26	8.9
Killings pests & animals	17	5.8
Lack of awareness	88	30.0
Increased yields	2	.7
Culture/tradition	142	48.5
Farming system	1	.3
Reuse ashes	2	.7
No CA training	1	.3
Other	1	.3
Total	293	100.0

Q40

40. All sources of revenue for all hh members	Frequency	Valid Percent
Gov employment	4	.3
Paid labor in private agriculture	8	.7
Seasonal worker	36	3.1
Occasional jobs	47	4.0
Own agriculture	598	51.2
Own livestock breeding, animal products	373	32.0
Self employed	88	7.5
Housewife	3	.3
Not economically active	6	.5
Children (<14) working	1	.1
Other	3	.3
Total	1167	100.0

329 households have at least one economically active household member, 245 households have at least two economically active household members, 44 households have a third economically active household member, and one household has only one fifth economically active household member. The majority has at least two sources of income including own agriculture and own livestock rearing.

Q41

41.a All annual income from all economically active household members (TSH)	Statistics
N Valid	327
N Missing	6
Mean	330722.3242
Median	186000.0000
Minimum	10500.00
Maximum	8590000.00
Sum	108146200.00

41.b All annual income from all economically active household members (TSH)	Frequency	Percent	Valid Percent
Up to 50000	34	10.2	10.4
50001 to 100000	49	14.7	15.0
100001 to 150000	46	13.8	14.1
150001 to 200000	52	15.6	15.9
200001 to 250000	41	12.3	12.5
250001 to 500000	60	18.0	18.3
500001 to 1000000	31	9.3	9.5
More than 1 Mio.	14	4.2	4.3
Total	327	98.2	100.0

41. c All annual income from all economically active household members (TSH) per hh head	Statistics
N Valid	327
N Missing	6
Mean	97269.2712
Median	46000.0000
Minimum	3000.00
Maximum	4295000.00
Sum	31807051.67

41.d All annual income from all economically active household members (TSH) per hh head	Frequency	Percent	Valid Percent
Up to 15000	41	12.3	12.5
15001 to 25000	29	8.7	8.9
25001 to 50000	107	32.1	32.7
50001 to 75000	47	14.1	14.4
75001 to 100000	32	9.6	9.8
100001 to 150000	35	10.5	10.7
150001 to 200000	13	3.9	4.0
More than 200000	23	6.9	7.0
Total	327	98.2	100.0

Q42

42.a Main bread winner	Frequency	Percent	Valid Percent
Man	253	76.0	76.7
Woman	77	23.1	23.3
Total	330	99.1	100.0

42.b Second bread winner	Frequency	Percent	Valid Percent
Man	19	5.7	7.9
Woman	223	67.0	92.1
Total	242	72.7	100.0

42.c Third bread winner	Frequency	Percent	Valid Percent
Man	10	3.0	43.5
Woman	13	3.9	56.5
Total	23	6.9	100.0

(There was no question nr. 43 in the questionnaire)

Q44

44.a Additional sources of income	Frequency	Percent	Valid Percent
Yes	115	34.5	34.6
No	217	65.2	65.4
Total	332	99.7	100.0

44.b Type of additional income	Frequency	Valid Percent
Transfer from relative abroad	1	.8
Transfer from relative in Tanzania	102	86.4
Gifts	5	4.2
Saving clubs/microfinance	8	6.8
Food and animals	2	1.7
Total	118	100.0

44.c All frequencies of additional income	Frequency	Valid Percent
Once a week	3	2.5
Once a month	12	10.2
Twice a month	3	2.5
Every six months	21	17.8
Once a year	44	37.3
Irregular	29	24.6
Other	1	.8
Don't know	5	4.2
Total	118	100.0

44. d Type 1 of additional sources of income	Frequency of additional income (1)																Total	
	Once a week		Once a month		Twice a month		Every six months		Once a year		Irregular		Other		Don't know			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Transfer from relative abroad	0	.0	0	.0	0	.0	0	.0	0	.0	1	3.7	0	.0	0	.0	1	.9
Transfer from relative in Tanzania	3	100.0	12	100.0	2	66.7	18	85.7	36	83.7	26	96.3	1	100.0	4	80.0	102	88.7
Gifts	0	.0	0	.0	0	.0	0	.0	2	4.7	0	.0	0	.0	0	.0	2	1.7
Saving clubs/microfinance	0	.0	0	.0	0	.0	2	9.5	5	11.6	0	.0	0	.0	1	20.0	8	7.0
Food and animals	0	.0	0	.0	1	33.3	1	4.8	0	.0	0	.0	0	.0	0	.0	2	1.7
Total	3	100.0	12	100.0	3	100.0	21	100.0	43	100.0	27	100.0	1	100.0	5	100.0	115	100.0

44.e Amount per year in TSH from source type 1	Frequency	Percent	Valid Percent
Up to 10000	5	1.5	5.1
10001 to 20000	15	4.5	15.2
20001 to 50000	24	7.2	24.2
50001 to 100000	19	5.7	19.2
100001 to 200000	21	6.3	21.2
More than 200000	15	4.5	15.2
Total	99	29.7	100.0

44.f Amount per year in TSH from source type 2	Frequency	Percent	Valid Percent
10001 to 20000	1	.3	33.3
20001 to 50000	2	.6	66.7
Total	3	.9	100.0

44.g All frequencies of additional income	Amount per year in TSH from source type 1													
	Up to 10000		10001 to 20000		20001 to 50000		50001 to 100000		100001 to 200000		More than 200000		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Once a week	1	20.0	0	.0	1	4.0	0	.0	1	4.8	0	.0	3	2.9
Once a month	0	.0	1	6.7	5	20.0	1	4.8	2	9.5	1	6.7	10	9.8
Twice a month	0	.0	0	.0	0	.0	0	.0	0	.0	2	13.3	2	2.0
Every six months	0	.0	2	13.3	4	16.0	4	19.0	6	28.6	2	13.3	18	17.6
Once a year	2	40.0	11	73.3	10	40.0	8	38.1	6	28.6	4	26.7	41	40.2
Irregular	2	40.0	1	6.7	4	16.0	7	33.3	5	23.8	6	40.0	25	24.5
Other	0	.0	0	.0	0	.0	1	4.8	0	.0	0	.0	1	1.0
Don't know	0	.0	0	.0	1	4.0	0	.0	1	4.8	0	.0	2	2.0
Total	5	100.0	15	100.0	24	96.0	19	90.5	21	100.0	15	100.0	99	97.1

44.h Amount of all additional income (TSH)	Statistics
N Valid	99
N Missing	234
Mean	127626.2626
Median	80000.0000
Minimum	1000.00
Maximum	1000000.00
Sum	12635000.00

44.i Amount of all additional income (TSH)	Frequency	Percent	Valid Percent
Up to 10000	5	1.5	5.1
10001 to 20000	15	4.5	15.2
20001 to 50000	23	6.9	23.2
50001 to 100000	19	5.7	19.2
100001 to 200000	22	6.6	22.2
More than 200000	15	4.5	15.2
Total	99	29.7	100.0

44.j All income from revenue and external sources (TSH) (q41+44)	Statistics
N Valid	327
N Missing	6
Mean	367924.1590
Median	214000.0000
Minimum	12000.00
Maximum	8590000.00
Sum	120311200.00

44.k All income from revenue and external sources (TSH) (q41+44)	Frequency	Percent	Valid Percent
Up to 50000	25	7.5	7.6
50001 to 100000	46	13.8	14.1
100001 to 150000	40	12.0	12.2
150001 to 200000	44	13.2	13.5
200001 to 300000	60	18.0	18.3
300001 to 500000	53	15.9	16.2
500001 to 1000000	44	13.2	13.5
More than 1 Mio.	15	4.5	4.6
Total	327	98.2	100.0

44.l All income from revenue and external sources (TSH) (q41+44) per household heads	Statistics
N Valid	327
N Missing	6
Mean	108899.6338
Median	57750.0000
Minimum	3000.00
Maximum	4295000.00
Sum	35610180.24

44.m All income from revenue and external sources (TSH) (q41+44) per household heads	Frequency	Percent	Valid Percent
Up to 15000	29	8.7	8.9
15001 to 25000	29	8.7	8.9
25001 to 50000	92	27.6	28.1
50001 to 75000	52	15.6	15.9
75001 to 100000	33	9.9	10.1
100001 to 200000	62	18.6	19.0
More than 200000	30	9.0	9.2
Total	327	98.2	100.0

Q45

45.a Annual expenditures on (in TSH)	Household expenditures	Health	Education/ school	Agriculture	Livestock
N Valid	302	311	154	144	21
N Missing	31	22	179	189	312
Mean	152488.2781	13978.4566	35290.9091	50697.9167	18309.5238
Median	86000.0000	5000.0000	18000.0000	20000.0000	6000.0000
Minimum	3600.00	1500.00	1000.00	3000.00	1000.00
Maximum	1800000.00	500000.00	480000.00	2000000.00	144000.00
Sum	46051460.00	4347300.00	5434800.00	7300500.00	384500.00

45.b Annual expenditures on (in TSH)	Social issues	Transport	Rent for agricultural	Rent for house	Energy
N Valid	98	52	88	2	13
N Missing	235	281	245	331	320
Mean	10969.3878	25557.6923	16970.4545	73500.0000	19555.0000
Median	5000.0000	17500.0000	7000.0000	73500.0000	88.0000
Minimum	500.00	2000.00	2000.00	3000.00	88.00
Maximum	100000.00	130000.00	480000.00	144000.00	120000.00
Sum	1075000.00	1329000.00	1493400.00	147000.00	254215.00

45.c Annual household expenditures in TSH (grouped)	Frequency	Percent	Valid Percent
Up to 25000	44	13.2	14.6
25001 to 50000	57	17.1	18.9
50001 to 100000	66	19.8	21.9
100001 to 200000	58	17.4	19.2
200001 to 400000	55	16.5	18.2
More than 400000	22	6.6	7.3
Total	302	90.7	100.0

45.d Annual health expenditures in TSH (grouped)	Frequency	Percent	Valid Percent
Up to 3000	20	6.0	6.4
3001 to 6000	182	54.7	58.5
6001 to 12000	44	13.2	14.1
12001 to 24000	42	12.6	13.5
More than 24000	23	6.9	7.4
Total	311	93.4	100.0

45.e Annual education/school expenditures in TSH (grouped)	Frequency	Percent	Valid Percent
Up to 5000	20	6.0	13.0
5001 to 10000	34	10.2	22.1
10001 to 15000	20	6.0	13.0
15001 to 20000	25	7.5	16.2
20001 to 40000	32	9.6	20.8
40001 to 80000	10	3.0	6.5
More than 80000	13	3.9	8.4
Total	154	46.2	100.0

45.f Annual agriculture expenditures in TSH (grouped)	Frequency	Percent	Valid Percent
Up to 5000	23	6.9	16.0
5001 to 10000	22	6.6	15.3
10001 to 15000	16	4.8	11.1
15001 to 20000	24	7.2	16.7
20001 to 40000	22	6.6	15.3
40001 to 80000	22	6.6	15.3
More than 80000	15	4.5	10.4
Total	144	43.2	100.0

45.g Annual livestock expenditures in TSH	Frequency	Percent	Valid Percent
1000.00	2	.6	9.5
1500.00	1	.3	4.8
2000.00	2	.6	9.5
3000.00	3	.9	14.3
5000.00	2	.6	9.5
6000.00	3	.9	14.3
10000.00	4	1.2	19.0
36000.00	1	.3	4.8
60000.00	2	.6	9.5
144000.00	1	.3	4.8
Total	21	6.3	100.0

45.h Annual social expenditures in TSH (grouped)	Frequency	Percent	Valid Percent
Up to 3000	23	6.9	23.5
3001 to 6000	34	10.2	34.7
6001 to 12000	21	6.3	21.4
12001 to 24000	10	3.0	10.2
More than 24000	10	3.0	10.2
Total	98	29.4	100.0

45.i Annual transport expenditures in TSH	Frequency	Percent	Valid Percent
2000.00	2	.6	3.8
4000.00	1	.3	1.9
5000.00	3	.9	5.8
6000.00	2	.6	3.8
10000.00	9	2.7	17.3
12000.00	4	1.2	7.7
13000.00	1	.3	1.9
15000.00	4	1.2	7.7
20000.00	5	1.5	9.6
25000.00	1	.3	1.9
26000.00	1	.3	1.9
30000.00	6	1.8	11.5
32000.00	1	.3	1.9
40000.00	4	1.2	7.7
50000.00	5	1.5	9.6
60000.00	1	.3	1.9
120000.00	1	.3	1.9
130000.00	1	.3	1.9
Total	52	15.6	100.0

45.j Annual rent for agricultural land in TSH	Frequency	Percent	Valid Percent
2000.00	3	.9	3.4
2400.00	1	.3	1.1
3000.00	6	1.8	6.8
5000.00	30	9.0	34.1
6000.00	4	1.2	4.5
8000.00	1	.3	1.1
10000.00	14	4.2	15.9
12000.00	2	.6	2.3
15000.00	10	3.0	11.4
18000.00	1	.3	1.1
20000.00	6	1.8	6.8
24000.00	2	.6	2.3
25000.00	1	.3	1.1
30000.00	2	.6	2.3
40000.00	1	.3	1.1
48000.00	1	.3	1.1
60000.00	1	.3	1.1
72000.00	1	.3	1.1
480000.00	1	.3	1.1
Total	88	26.4	100.0

45.k Annual rent for house in TSH	Frequency	Percent	Valid Percent
3000.00	1	.3	50.0
144000.00	1	.3	50.0
Total	2	.6	100.0

45.l Annual energy expenditures in TSH	Frequency	Percent	Valid Percent
1500.00	1	.3	20.0
36000.00	1	.3	20.0
48000.00	2	.6	40.0
120000.00	1	.3	20.0
Total	5	1.5	100.0

45.m All annual expenditures in TSH	Statistics
N Valid	325
N Missing	8
Mean	208666.0308
Median	125000.0000
Minimum	5000.00
Maximum	2190000.00
Sum	67816460.00

45.n All annual expenditures in TSH (grouped)	Frequency	Percent	Valid Percent
Up to 25000	23	6.9	7.1
25001 to 50000	44	13.2	13.5
50001 to 100000	73	21.9	22.5
100001 to 150000	47	14.1	14.5
150001 to 200000	30	9.0	9.2
200001 to 250000	17	5.1	5.2
250001 to 500000	67	20.1	20.6
More than 800000	24	7.2	7.4
Total	325	97.6	100.0

45.o Balanced income ((all revenue and external income+all expenditures)/2) (q44+q45)	Statistics
N Valid	320
N Missing	13
Mean	291608.8438
Median	193250.0000
Minimum	18000.00
Maximum	4368500.00
Sum	93314830.00

45.pBalanced income ((all revenue and external income+all expenditures)/2) (q44+q45)	Frequency	Percent	Valid Percent
Up to 50000	16	4.8	5.0
50001 to 100000	53	15.9	16.6
100001 to 150000	54	16.2	16.9
150001 to 200000	40	12.0	12.5
200001 to 300000	59	17.7	18.4
300001 to 400000	38	11.4	11.9
400001 to 600000	35	10.5	10.9
More than 600000	25	7.5	7.8
Total	320	96.1	100.0

45.q Balanced income per hh head ((all revenue and external income+all expenditures)/2) (q44+q45)	Statistics
N Valid	320
N Missing	13
Mean	84834.1957
Median	52125.0000
Minimum	3000.00
Maximum	2184250.00
Sum	27146942.62

45.r Balanced income per hh head ((all revenue and external income+all expenditures)/2) (q44+q45)	Frequency	Percent	Valid Percent
Up to 15000	22	6.6	6.9
15001 to 25000	38	11.4	11.9
25001 to 50000	92	27.6	28.8
50001 to 75000	57	17.1	17.8
75001 to 100000	39	11.7	12.2
100001 to 200000	50	15.0	15.6
More than 200000	22	6.6	6.9
Total	320	96.1	100.0

EXCHANGE RATE 1 USD = 1758 TSH

Members of two households live above poverty line of 1.25 USD per day, and only one household with 2 USD per day.

45.s Balanced income per hh head ((all revenue and external income+all expenditures)/2) (q44+q45) in USD BY LOCATION	KOLERO	KASANGA	BALANI	Mlangano	Kizagila
N Valid	62	61	69	64	64
N Missing	10	3	0	0	0
Mean	69.1819	38.4384	32.6562	57.4717	44.9447
Median	34.5208	30.7167	24.9336	32.2099	29.3895
Minimum	5.07	3.36	5.40	3.29	1.71
Maximum	1242.46	184.87	117.32	402.02	304.75
Sum	4289.28	2344.74	2253.28	3678.19	2876.46

Even when looking at daily balanced income for only adults in the households, only in three households people live above poverty line of 1.25USD; and in two households members live above 2 USD per day.

→ Shows again that people mainly live from their own agriculture at a subsistence level, and only sell the limited surplus they have.

Q46

46. Assess economic situation of the household	Frequency	Percent	Valid Percent
Very poor, there is sometimes even not enough food available	111	33.3	33.3
Poor, but have no food problems and only sometimes problems buying clothes	127	38.1	38.1
Moderate, enough money for food clothes, health care, school	93	27.9	27.9
Moderate, enough money even for some luxurious objects like motorbikes, car, computer	2	.6	.6
Total	333	100.0	100.0

Q47

47.a First priority of household	Frequency	Percent	Valid Percent
Better Food	100	30.0	30.2
Better Clothes	6	1.8	1.8
Repair house	100	30.0	30.2
Better health services	16	4.8	4.8
Better schools	5	1.5	1.5
Better water	1	.3	.3
Buy car or motorbike	7	2.1	2.1
Open shop/business	22	6.6	6.6
Start Professional training	5	1.5	1.5
Buy livestock	9	2.7	2.7
Hire farm staff	3	.9	.9
Buy livestock goods/equipment	3	.9	.9
Buy seeds	12	3.6	3.6
Buy agricultural goods/equipment	42	12.6	12.7
Total	331	99.4	100.0

47.b Second priority of household	Frequency	Percent	Valid Percent
Better Food	49	14.7	15.3
Better Clothes	24	7.2	7.5
Repair house	72	21.6	22.5
Better health services	26	7.8	8.1
Better schools	13	3.9	4.1
Better water	3	.9	.9
Electricity supply	1	.3	.3
Buy car or motorbike	8	2.4	2.5
Open shop/business	37	11.1	11.6
Start Professional training	10	3.0	3.1
Buy livestock	17	5.1	5.3
Hire farm staff	8	2.4	2.5
Buy livestock goods/equipment	4	1.2	1.3
Buy seeds	16	4.8	5.0
Buy agricultural goods/equipment	32	9.6	10.0
Total	320	96.1	100.0

47.c Third priority of Household	Frequency	Percent	Valid Percent
Better Food	49	14.7	15.3
Better Clothes	24	7.2	7.5
Repair house	72	21.6	22.5
Better health services	26	7.8	8.1
Better schools	13	3.9	4.1
Better water	3	.9	.9
Electricity supply	1	.3	.3
Buy car or motorbike	8	2.4	2.5
Open shop/business	37	11.1	11.6
Start Professional training	10	3.0	3.1
Buy livestock	17	5.1	5.3
Hire farm staff	8	2.4	2.5
Buy livestock goods/equipment	4	1.2	1.3
Buy seeds	16	4.8	5.0
Buy agricultural goods/equipment	32	9.6	10.0
Total	320	96.1	100.0

47.d All mentioned priorities of Household	Frequency	Percent
Better Food	195	19.9
Better Clothes	54	5.5
Repair house	253	25.9
Better health services	62	6.3
Better schools	29	3.0
Better water	7	.7
Electricity supply	1	.1
Buy car or motorbike	21	2.1
Open shop/business	86	8.8
Start Professional training	22	2.2
Buy livestock	45	4.6
Hire farm staff	21	2.1
Buy livestock goods/equipment	12	1.2
Buy seeds	55	5.6
Buy agricultural goods/equipment	115	11.8
Total	978	100.0

Q48

48. Assessment of interview	Frequency	Percent	Valid Percent
sincere	319	95.8	95.8
not sincere	8	2.4	2.4
can not estimate the sincerity	6	1.8	1.8
Total	333	100.0	100.0

ANNEX C

CONVERSION OF WEIGHTS AND VOLUMES

Local measurements		Maize (kg)	Sorghum (kg)	Sesame (kg)	Paddy (kg)	Cassava (kg)	Banana (kg)	Pigeon peas (kg)	Cow peas (kg)
Name	Size ¹⁴								
Amboni	20l	15.2	16	19	15	16		17.2	12.2
Ng'ondo	4l	3.04	3.2	3.8	3	3.2		3.44	2.44
Selina	1l	0.76	0.8	0.95	0.75	0.8		0.86	0.61
Trunk							30kg		

Source: <http://www.aqua-calc.com/page/density-table>

¹⁴ Sizes of buckets