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Summary of Baseline Household Survey Results: Borana, Ethiopia

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MARIL

Managing Risk for Improved Livelihoods



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Abstract

This report summarizes the results of a baseline household-level survey, led by the Climate Change, Agriculture and Food Security Consortium Research Program¹ (CCAFS), carried out in 7 villages and 140 households in Borana, southern Ethiopia. The objective of this baseline effort was to describe the characteristics of the farming systems found across a wide range of research sites in 12 countries, including the Borana site, and to better understand what kinds of farming practice changes households have been making and why. We gathered information on the socio-economic and demographic characteristics of these farming households, basic livelihood and welfare indicators, agriculture and natural resources management practices and strategies, access to and use of climate and agricultural-related information, and current risk management, mitigation and adaptation practices. Randomly selected households were the units of analysis and a face-to-face questionnaire was the primary tool that was used for data collection.

Borans are largely pastoralists whose mainstay of livelihood is livestock keeping, but virtually all households surveyed also produce some crops, and 39% of them also sell some crops. Production of fruits and vegetables is not common, with only 9% of households producing and consuming fruits, and 2% vegetables.

Five percent of households owned no cattle. The majority of households have relatively small herds of cattle (less than 20 heads), as well as small stock (sheep, goats and/or chickens). Camels are owned by 28% of households. Roughly two-thirds sell cattle, and 70% sell small stock. A large number of households (79%) also produce and consume milk or other livestock products, and 40% sell livestock products. They also produce fodder to feed their animals and gather wood for fuel, but few sell these products coming from their own farms.

Off-farm livelihood sources are limited, with 13% of households producing/harvesting food crops and 37% gathering fruit from places other than their own farms. Almost two-thirds obtain fodder from off-farm sources. All households also gather fuelwood from locations away from the land they own.

Income diversification strategies are limited in Borana. One-quarter of households produce four or fewer different types of agricultural products, and one-half sell only one or two. Fourteen percent of households obtained no cash income at all from agriculture or livestock.

One-half of households have no other source of off-farm income. Employment on other peoples' farms, or from another type of job, is a source of income for only a few households. Business and remittances are the most important sources of cash income (other than from their own farms), with 19% of these households reporting receiving cash income from some type of business and 11% from remittances/gifts.

Our results suggest that household-level food insecurity is high and widespread in Borana. Only two households reported being food secure throughout the year. One-half of households have food deficits for over 6 months of the year. Another one-quarter struggle to feed their families for 5-6 months, and 18% reported 3-4 hunger months in a typical rainfall year.

¹ For more information about CCAFS, see: <http://www.ccafs.cgiar.org> A complementary community-level survey was also conducted in Borana and those survey guidelines and reports will also be available on the website.

Households have been making changes in their farming practices over the last 10 years, but they are not extensive. Maize, beans and wheat are the most important food crops, both now and 10 years ago. The predominant changes made include expansion in cropping area planted, earlier land preparation, earlier planting, and introduction of intercropping. For maize (the most important crop for the majority of households), the most frequently cited changes made in terms of varietal changes were shifts to shorter cycle and/or drought tolerant varieties.

Changes in soil and/or water management practices have been limited. 70% of respondents reported making no soil management-related changes in the last 10 years. All households have made some kind of tree/agroforestry management-related changes (e.g. planting few trees, for example less than 10, on their farm) in the last decade, however.

Changes in their livestock management practices have also been occurring. More than half of the surveyed households now own one or more chickens, not a common practice in the past, and one that may be providing a good source of income for women (and warrants further study). Cut and carry feed systems are being introduced, as is the storage of fodder. Improved pastures and growing fodder crops are practices not yet occurring in Borana, however.

Reasons given for changes to their crop and livestock practices were predominantly market-related, including higher prices and productivity and/or more opportunities to sell as major factors. One-quarter of households indicated that it was a drop in the productivity of land that drove them to make changes, and a similar percentage gave climate-related reasons for changing their agricultural practices. The most common climate-related reasons for change were less overall rainfall, more erratic rainfall, and more frequent droughts.

Crop production is very low-input in Borana – no households use purchased chemical fertilizers and only a few households used certified/improved seeds. Over three-quarters of households have not increased their input use at all in the last 10 years, and the vast majority have not increased their productivity. Use of veterinary drugs is widespread, however.

Two-thirds of households reported receiving some kind of weather/climate-related information over the past 12 months. This was predominantly forecasts of extreme events such as droughts, and only one-quarter of households heard this information on the radio. Forecasts on the timing of the start of the rains are also being received, but only by one-fifth of households. Most rely on traditional sources and indigenous knowledge for this information. Virtually all households received no weather forecasts, either short or longer term, nor forecasts of pest or disease outbreaks.

Collective action for agricultural and natural resource management-related activities appears to be very low. Savings and credit, agricultural productivity enhancement, agricultural marketing groups, and water catchment groups are the most common types of groups, and most are male dominated.

Asset ownership and access to services is very low in Borana. One-quarter of households had some type of improved storage facility for grain. None reported having electricity, running water, improved housing/roofing, or a water storage tank for domestic water. Only three households reported owning a bicycle, two have a bank account, and one household owns a

mechanical plough. None has an improved (non-traditional) stove. One-fifth of households reported own a radio, but 30% now own a cell phone.

This baseline survey has provided some key indicators relating to household well-being and agricultural adaptation strategies that will be monitored over time. This information will help to better target interventions aimed at improving them, as well as identifying key gaps in information that warrant further research.

Keywords

Climate change; agriculture; Ethiopia; farming system; food security, adaptation, mitigation

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Contents

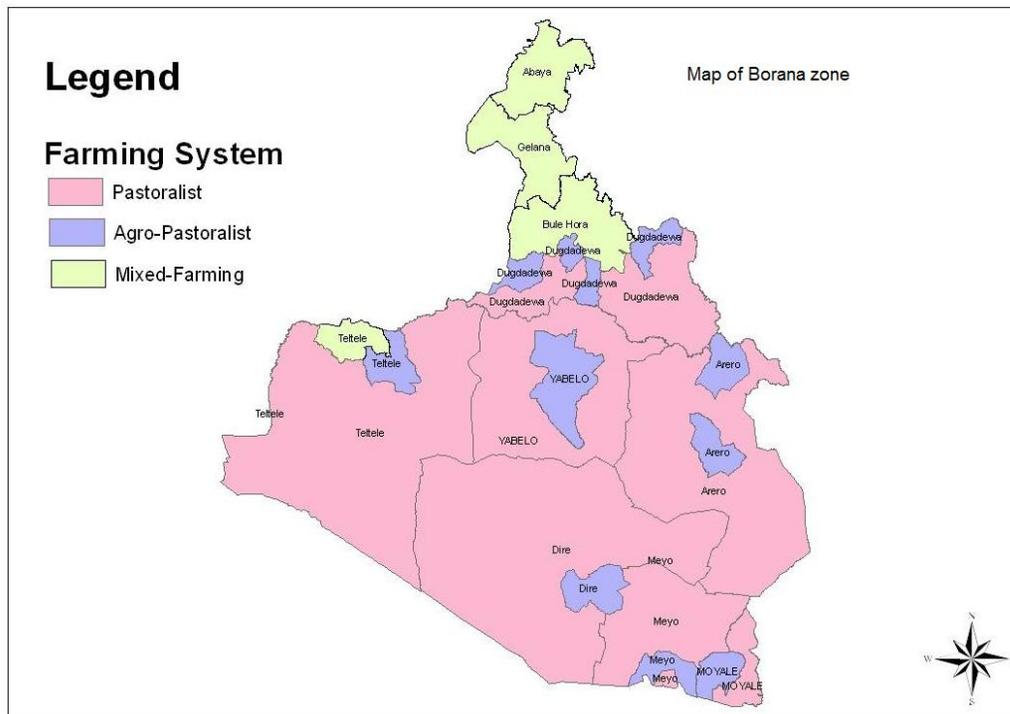
Abstract	3
Keywords	5
About the authors	5
1.0 Introduction	7
1.1 Household Types and Respondents.....	7
2.0 Household Demographics	8
2.1 Education Levels	9
3.0 Sources of Livelihoods	9
3.1 On-farm livelihood sources	9
3.2 Off-farm livelihood sources and diversification indices.....	10
3.3 Diversification Indices	11
3.4 Who does most of the work on and off-farm?.....	12
3.5 Sources of Cash Income	13
4.0 Crop, Farm Animals, Tree and Soil, Land Water Management Changes	14
4.1 Crop related changes	14
Adopters of new crops/varieties.....	14
Water management related changes.....	15
Soil Management related changes.....	15
Tree/Agroforestry management related changes.....	15
Other changes	16
4.2 Livestock Production.....	17
4.3 Livestock-related changes	19
Feed related changes.....	20
4.4 Adaptability/Innovation Index.....	20
4.5 Mitigation Indices	21
5.0 Food Security.....	22
6.0 Land and Water	24
7.0 Inputs and Credit	25
8.0 Climate and Weather Information	25
8.1 Sources of weather-related information	26
9.0 Community Groups.....	27
9.1 Climate-Related Crisis	27
10.0 Assets	28
Appendix 1: Survey Process and Implementation	29
Appendix Two: Randomly selected villages for the baseline study	33

1.0 Introduction

This report presents the results of an analysis of the CCAFS baseline household survey carried out in 7 villages, with 140 households in two districts (Yabello and Arero) in Borana zone, southern Ethiopia. The two selected survey districts are situated in a semi-arid to arid agro-ecological gradient dominantly occupied by the Boran ethnic group. Borans are largely pastoralists whose mainstay of livelihood is livestock keeping. In some small areas they also practice dryland farming. The survey was conducted from 30/12/2010–14/01/2011. A team leader, field supervisor, and enumerators were involved in the data collection. Local community leaders, elders and officials played a significant role in facilitating the data collection process. Data entry and initial cleaning was done using CSPRO. More cleaning and analysis was done using SPSS.

Figure 1 shows the location of the Borana zone and the two survey districts from which the 7 villages and the 140 households were randomly selected. All 140 respondents were willing to participate in the survey and to answer all the questions.

Figure 1. Map of Borana zone by district and farming system



Below is a summary of the main findings of the analysis of the survey data, reported following each section of the questionnaire (available at www.ccafs.cgiar.org).

1.1 Household Types and Respondents

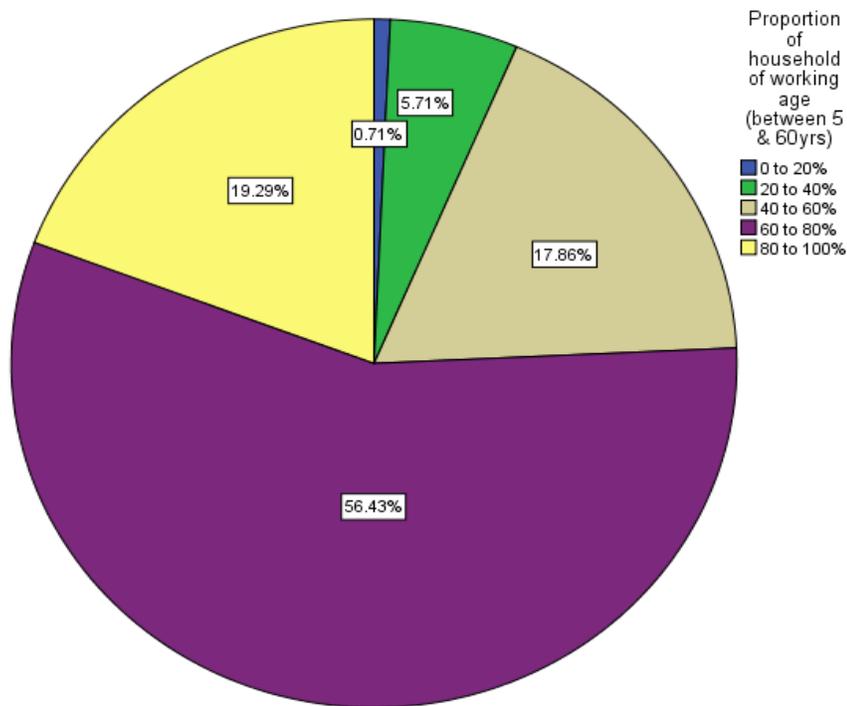
Seventy-two percent of the survey households were male-headed and 28% female-headed, despite the fact that even households where the man is not present much of the time are still

considered male-headed. In terms of respondents, however, 59% were male and 41% female. The high proportion of female respondents was due to the large number of widowed households (18%) and the large number of husbands away for casual employment (10%), together with old and sick husbands who were unfit for interviewing. For nine out of the 14 households (10%), in which the husbands were away from the house for a long time, their wives were making decisions on important household issues relating to agricultural/livestock production, marketing, etc. All the respondents were from one ethnic group, the Boran Oromo.

2.0 Household Demographics

The survey results show a median household size of 7 people. Figure 2.1 shows the proportion of the household of working age. A small proportion of households, 6.4% (the green and blue in Figure 2.1), have relatively few members of working age (40% or less). In roughly three-quarters of the surveyed households, at least 60% are of working age.

Figure 2.1 Proportion of the household of working age



2.1 Education Levels

Table 2.2 shows that 76% of the survey households had someone who had obtained a primary, secondary, or post secondary education, and 24% of the household had no members with any formal education.

Table 2.2 Levels of education

Highest level of education of any resident household member	Number of households	Percent of households
No formal education	34	24
Primary	65	47
Secondary	23	16
Post secondary	18	13
Total	140	100

While one-quarter of households have no member with any formal education, the increasing importance and willingness of traditional pastoralists in Borana to invest in education is also reflected in these findings, as 29% of households had at least one member with a secondary or post secondary education.

3.0 Sources of Livelihoods

3.1 On-farm livelihood sources

Table 3.1 shows the diversity in production, consumption and sales of different types of agricultural products. 96% of households produced food crops on their own farms, and 39% of them sold some of it.

Production of fruits and vegetables were not common, with only 9% of households producing and consuming fruits, and 2% vegetables.

Livestock production is very important to livelihoods. Almost all households produced both large and small livestock. 71% and 79% of these households consumed large and small livestock, respectively. 60% of respondents reported selling large livestock (cattle), and 70% sold small livestock (sheep, goats, or chickens). A large number of households (79%) also produced and consumed milk or other livestock products, and 40% sold livestock products.

On-farm fodder production was also an important livelihood source, and mostly used for feeding their own animals. More than half of the respondents produced and used fodder on their own farms.

Almost two-thirds of respondents said they produce and consume fuelwood from their own farms, and only 2% sell it.

Table 3.1 On-farm livelihood sources

Product	Percent of households:		
	Producing	Consuming	Selling
Food crops raw	96	93	39
Food crops processed	42	39	4
Fruits	9	9	0
Vegetables	2	2	0
Fodder	58	56	1
Large livestock	99	71	60
Small livestock	96	79	70
Livestock products	79	70	40
Timber	2	1	0
Fuel wood	67	62	2
Charcoal	2	1	1
Honey	5	4	3
Manure/compost	4	4	0

3.2 Off-farm livelihood sources and diversification indices

Off-farm livelihood sources were fairly limited, with 13% of households producing/harvesting food crops and 37% gathering fruit from places other than their own farms. Almost two-thirds obtained fodder from off-farm sources. All households gather fuelwood outside of the land they own. A few households also obtain charcoal and honey off-farm. Few if any of these households sold any of the products they obtained off-farm.

Table 3.2 Off-farm livelihood sources

Product	% of households:	
	Producing/ harvesting	Selling
Food crops	13	3
Fruits	37	1
Fodder	64	0
Timber	4	1
Fuel wood	100	1
Charcoal	2	1
Honey	6	2

3.3 Diversification Indices

An agricultural production diversification index was created by adding up the total number of agricultural/livestock products produced on-farm:

- 1=1-4 products (low production diversification)
- 2=5-8 products (intermediate production diversification)
- 3=more than 8 products (high production diversification)

On the selling/commercialization side, the total numbers of agricultural/livestock products produced on their own farms, with some of the products sold were added up:

- 0=no products sold (no commercialization)
- 1=1-2 products sold (low commercialization)
- 2=3-5 products sold (intermediate commercialization)
- 3=more than 5 products sold (high commercialization)

The results of these diversification indices for our surveyed households in Borana site are shown in Table 3.3. We found that 23% produced 4 or fewer different types of agricultural products. The large majority of the surveyed households (77%) produced 5 to 8 products. No households produced more than 8 products.

On the selling side, 14% of households obtained no income at all from agriculture or livestock. Almost half sold only one or two types of products, and 39% sold 3-5 different products. No households were highly diversified (selling more than 6 types of agricultural products) in this category.

Table 3.3 Production and Commercialization Diversification Indices

	% of households
Production Diversification:	
1-4 products (low production diversification)	23
5-8 products (intermediate production diversification)	77
9 or more products (high production diversification)	0
Selling/Commercialization Diversification:	
No products sold (no commercialization)	14
1-2 products sold (low commercialization)	47
3-5 products sold (intermediate commercialization)	39
6 or more products sold (high commercialization)	0

3.4 Who does most of the work on and off-farm?

The survey reveals that while roughly 1/3 of the on-farm work is shared equally by women and men (the blue section in Figure 3.1), women are perceived to bear the majority of the overall work responsibilities for almost half of households (the grey in Figure 3.1).

Figure 3.1 Workload by gender

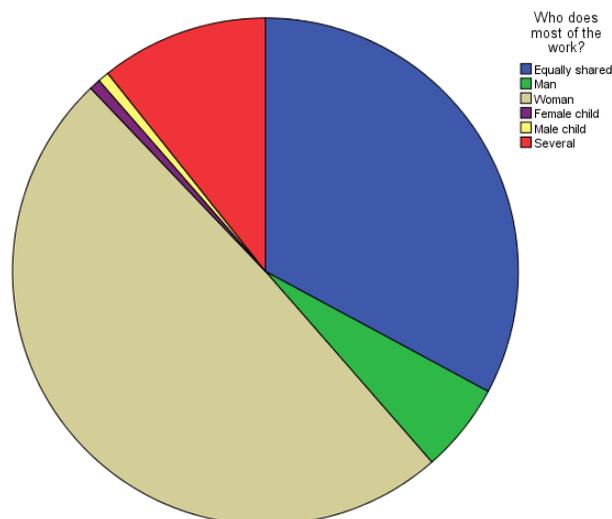


Table 3.4 shows the breakdown of women’s tasks by commodity. Women are the main ones responsible for livestock products such as milk for 61% of households, processing food crops for 24%, small livestock for 26%, and gathering fuelwood for over half of households. Women are largely not responsible for production of food crops.

Table 3.4 Female On-farm Work Load/responsibilities

Female is largely responsible for tasks related to:	Responses		Percent of Cases
	n	Percent	
Food crop (raw)	9	3	6
Food crop (processed)	33	11	24
Fruit	2	1	1
Fodder	46	15	33
Large livestock	11	4	8
Small livestock	37	12	26
Livestock products	85	27	61
Timber	1	.3	1
Fuel wood	76	24	54
Charcoal	1	.3	1
Manure compost	1	.3	1
Females not responsible for any product	13	4	9
(multiple responses possible)	315	100	225

With respect to women’s agricultural-related labour responsibilities off-farm (table not shown), the results show that 86% of households stated that women are largely responsible for gathering fuelwood, and 32% for obtaining fodder from sources other than their own land.

3.5 Sources of Cash Income

Table 3.5 shows diversity of cash income sources from off-farm activities. One-half of households have no other source of off-farm income. Employment on other peoples’ farms, or from another type of job, is a source of income for only a few households. Business and remittances are the most important sources of cash income (other than from their own farms), with 19% of these households reporting receiving cash income from some type of business, 11% from remittances/gifts, and 9% from formal (bank) loans, and 9% from informal credit sources.

Table 3.5 Sources of cash income other than own farm

Source of cash income	Percent of households
Employment on some else’s farm	4
Other paid employment	6
Business cash income	19
Remittances or gifts	11
Payments for environmental services	1
Other payment from projects/government	7
Loan or credit from formal financial institution	9
Loan or credit from informal source	9
Renting out farm machinery	1
No other source of cash income	52

4.0 Crop, Farm Animals, Tree and Soil, Land Water Management Changes

4.1 Crop related changes

Five percent of the households reported planting no crops. The rest reported that they have farmlands and cultivated at least one main crop. About half of the respondents reported cultivating 2 main crops, and a third of the households listed 3 crops they considered important for their livelihoods. Maize was mentioned by 87% of the households as the most important food crop. Beans was mentioned by 77% of the households as second most important food crop and wheat was mentioned by 22% the households as the third most important food crop.

Respondents were also asked about their most important food crops 10 years ago. Maize, beans and wheat remained the most important food crops for most both now and 10 years ago.

Adopters of new crops/varieties

Households were asked about what changes they have made to their farming practices over the last ten years, and to which crops. As seen in Table 4.1 below, 62% of households made at least one type of change to their cropping practices, whereas 38% made no changes whatsoever to their crops over the last 10 years.

Table 4.1 Number of crop-related changes

Cropping changes made in last 10 years	Percent of households
No change	38
1-2 changes made	29
>= 3 changes made	33

Table 4.2 examines at what kinds of cropping-related changes were made.

Table 4.2 Crop Related Changes

Crop Related Changes	Number of households who made changes to:		
	Most important crop	Second most important crop	Third most important crop
Introduced a new variety(ies)	35	14	5
Introduced intercropping	35	33	2
Stopped growing crop in one season	36	21	4
Planting a better quality variety(ies)	42	26	0
Introduced a new crop	26	16	9
Stopped growing crop totally	30	13	2
Expanded area	65	42	5
Switched to a shorter cycle variety	28	4	1
Switched to a drought tolerant variety	24	0	0
Earlier land preparation	52	43	2
Earlier planting	46	14	5
Introduced rotations	29	14	5

As can be seen in Table 4.2, expansion in the area planted, earlier land preparation, earlier planting, and intercropping are changes made by a large number of households. For maize (the most important crop for the majority of households), the most frequently cited changes made in terms of varietal changes were shifts to shorter cycle and/or drought tolerant varieties.

Water management related changes

For the water management-related changes, the following changes in practice were considered:

- Started irrigating;
- Introduced micro-catchments;
- Introduced improved irrigation;
- Introduced improved drainage.

Here, we found that only six households made any of these water management-related changes over the last 10 years.

Soil Management related changes

For the soil management related changes, we explored the following possibilities:

- Stopped burning;
- Introduced crop cover;
- Introduced ridges or bunds;
- Introduced mulching;
- Introduced terraces;
- Introduced stone lines;
- Introduced contour ploughing;
- Introduced rotations;
- Started using or using more mineral/chemical fertiliser;
- Started using manure/compost.

70% of respondents reported making no soil management-related changes in the last 10 years. 22% had made one such change, and 8% said they had made 2 or more.

Tree/Agroforestry management related changes

The results show that all of the households have made some kind of tree/agroforestry management-related changes (i.e. planting from 1-10 trees) in the last decade.

Other changes

We also looked at whether households have made any other changes to crops not specified above. Our findings showed that no households reported making any other crop-related changes.

Reasons for Crop-related changes

Households who made crop related changes did so for various reasons. One or combinations of factors have triggered the changes.

Table 4.3 Reasons for crop related changes

Reasons	Responses		Percent of Cases
	N	Percent	
Markets	56	46	70
Climate	28	23	35
Land	31	25	39
Labor	4	3	5
Pests/diseases	3	2	4
Projects	1	1	1

Markets. As can be seen in Table 4.3, market forces were responsible for most of the changes made. 70% of those who made changes have indicated better yield, price and/or more opportunities to sell as major factors influencing them to make the changes.

Land. A quarter also indicated that it was a drop in the productivity of land that drove them to make changes. In more than 90% of these land-related cases, shortage of farm land and loss of productivity were the specific reasons given for making changes.

Others. Influences of labor, pest and diseases and projects were minimal drivers of the changes that have been made.

Climate. Only about a quarter of the respondents made the changes due to climate-related reasons. When these were examined in more detail (Table 4.4), the most common climate-related reason for change, given by 72% of the households who cited at least one weather-related reason, was due to a perception of less overall rainfall. Next came more erratic rainfall (54%), and more frequent droughts (36%).

Table 4.4 Weather/climate-related reasons for changes in cropping practices

Climate/weather-related Reason	Percent of households that cited at least one weather/climate related reasons
More erratic rainfall	54
Less overall rainfall	72
More overall rainfall	18
More frequent droughts	36
More frequent floods	25
Later start of rains	4
Higher temperatures	7

4.2 Livestock Production

Livestock is key to livelihoods for the Borana. Households were asked about their livestock holdings by species (Table 4.5). They were also asked the number of livestock others manage for them (Table 4.6), and those animals which belong to others but are managed by members of their household (Table 4.7).

Table 4.5 Household livestock ownership by species

Number of animals owned/household	Percent of households			
	Cattle	Goats	Sheep	Camels
None	5	18	30	62
Less than 20	79	77	66	38
21 to 50	13	4	4	0
51 to 100	3	1	0	0

Five percent of households owned no cattle. Most households in this traditionally pastoral area (79%) have quite small herds of cattle, with less than 20 heads. A similar percentage of households (77%) own less than 20 goats and two-thirds have less than 20 sheep. Camels are owned by 38% of households.

Table 4.6 Number of livestock managed by others for household

Managed for the household by others	Percent of households			
	Cattle	Goats	Sheep	Camels
None	82	97	98	96
Less than 20	17	3	2	4
21 to 50	1	0	0	0
51 to 100	0	0	0	0

Cattle are entrusted to others by 17% of households, but in small numbers.

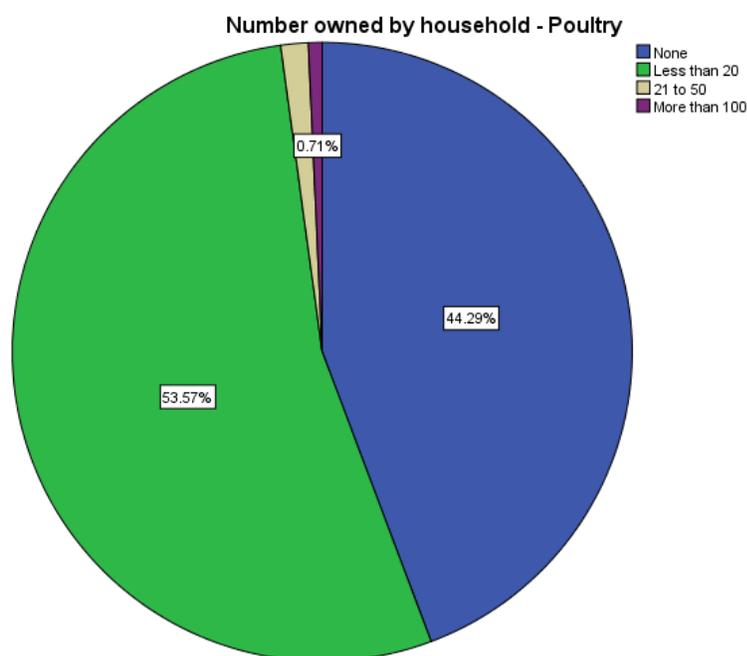
Table 4.7 Number of livestock managed by household for others

Number of animals managed by household for others	Percent of households			
	Cattle	Goats	Sheep	Camel
None	62	97	0	98
Less than 20	37	3	0	2
21 to 50	1	0	0	0
51 to 100	0	0	0	0

Borana also take care of livestock for others, but this pertains predominantly to cattle, and by 38% of surveyed households (Table 4.7).

More than half of the surveyed households own one or more chickens (Figure 4.1), which have become an important source of cash recently (Borana did not keep chicken in the past), particularly for women. In terms of other species, even percent of households own horses (less than 20). Only one household managed a few horses for others. Five households own one or two donkeys.

Figure 4.1 Poultry ownership



4.3 Livestock-related changes

Results from the survey show that 96% of the surveyed households own some livestock. As seen in Table 4.8, more than half (54%) of the households keep 3 different types of animals, 31% keep 2 livestock species, and 11% keep only one type.

Table 4.8 Livestock species owned

Type of livestock owned by households	Percent of households
No animals	4
1 animal type	11
2 animal types	31
3 animal types	54

When asked about changes made over the last 10 years with respect to livestock production practices, 43% of the households reported making changes to one or more of their most important farm animals. The majority of them (57%), have not made any changes. For those that had done something differently, these changes were further explored.

Adopters of new animal types/breeds

Very few households introduced new types of animals or new breeds. Less than 15 households said they had introduced new types of animals.

Herd-related changes

For herd-related changes the following indicators were considered:

- Reduction in herd size;
- Increase in herd size; and/or
- Change in herd composition.

The surveyed households reported no management changes with respect to the size or composition of their herds in the last decade.

Animal Management Related Changes

Animal management-related changes included the following:

- Introduction of stall keeping;
- Introduction of fencing; and/or
- Introduction of the 'cut and carry' practice (gathering feed elsewhere and bringing it to the animals).

72% reported making none of these animal management-related changes. Twenty-eight percent made one of these changes, predominantly the introduction of cut and carry to feed animals at the homestead.

Feed related changes

The feed-related changes considered included the following:

- Growing fodder crops
- Improved pastures
- Fodder storage

There were 51 positive responses regarding changes made in feeding practices. Most of these households reported they had started to store fodder.

Reasons for changes to livestock farming practices

Several factors triggered the changes reported (Table 4.9). Market-related reasons were behind the majority of adaptations. Next in importance were land-related reasons. Climate-related drivers of change were cited in 35% of the cases. Labour constraints were not a major factor, nor were pests or diseases, or projects.

Table 4.9 Reasons for new livestock practices

Reasons for Change	Percent of Cases
Market-related	70
Land-related	39
Climate-related	35
Labour-related	5
Pest/disease-related	4
Project-related	1

The three market-related reasons given for making livestock practice changes were better prices, new opportunities to sell, and increases in productivity. The only climate-related driver of change mentioned was a more frequent occurrence of droughts.

4.4 Adaptability/Innovation Index

An Adaptability/Innovation Index was defined as the following:

0-1=zero or one change made in farming practices over last 10 years (low level)

1=2-10 changes made in farming practices (intermediate level)

2=11 or more changes made in farming practices (high level)

As can be seen in Table 4.10, 120 households (86%) made from two to ten changes to their agricultural practices in the last 10 years (Intermediate level adaptability/innovation index). Only 13 households made 11 or more changes to their crop and/or livestock practices.

Table 4.10 Adaptability/Innovation index

Number of changes made in farming practices in last 10 years:	% of households
Zero or One (low)	5
2-10 changes (intermediate)	86
11 or more changes (high)	9

4.5 Mitigation Indices

Several climate mitigation-related behavioral changes were used to create the following indices:

Tree management:

This index shows whether a household has either protected or planted trees within the last year.

Soil amendments:

This index shows if the household has used fertilizer in the last year, or have started using fertilizer or manure on at least one crop.

Input intensification:

There are 7 'changes in agricultural practices/behavior over the last 10 years considered here to create an index with 3 levels - no intensification (none of the following), low intensification (1-3 of the following), and high intensification (4-7 of the following). They are:

- Purchased fertilizer
- Started to irrigate
- Started using manure/compost
- Started using mineral/chemical fertilizers
- Started using pesticides/herbicides
- Started using integrated pest management techniques
- Planted higher yielding varieties

Productivity Index:

This index shows if a household has reported achieving a better yield from any crop, or that their land is more productive for any crop over the last 10 years – such households are classified as showing an "increase in productivity".

Table 4.11 shows the results for the mitigation-related indices for the surveyed households in the Borana site. All households reported having planted from 1 to 10 trees in the past decade on their land. Virtually none of them are taking any actions to improve their soil fertility. Almost 2/3 reported seeing some productivity increases over the last decade, however. Most (82%) have not intensified their farming system (i.e. increased levels of inputs). Some (18%) have started to intensify their production, but only at very low levels.

Table 4.11 Mitigation-related indices

Index	% of households	
	None	Some
Tree management	0	100
Soil amendments	99	1
Productivity increase	61	39
Input intensification	82	Low-18 High - 0

5.0 Food Security

As seen in Figure 5.1, for the months May through October, the main source of food for households is their own farm and herd. For the other 7 months (November through May), households obtain their food mainly from other sources, including purchasing at the market or through food aid or other government programs. From November to March, they get more than 60% of their food from other sources. During January, February and March, more than 90% of their food comes from sources other than their own farms/herds.

Figure 5.1 Main source of food by month

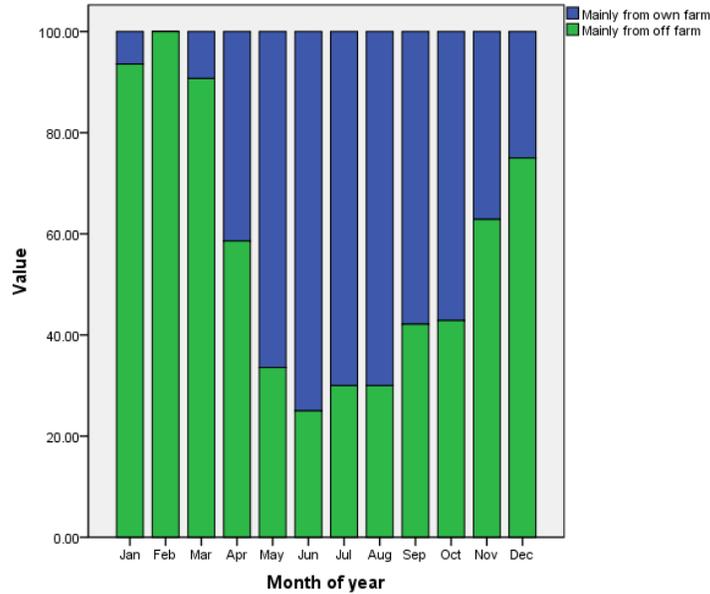
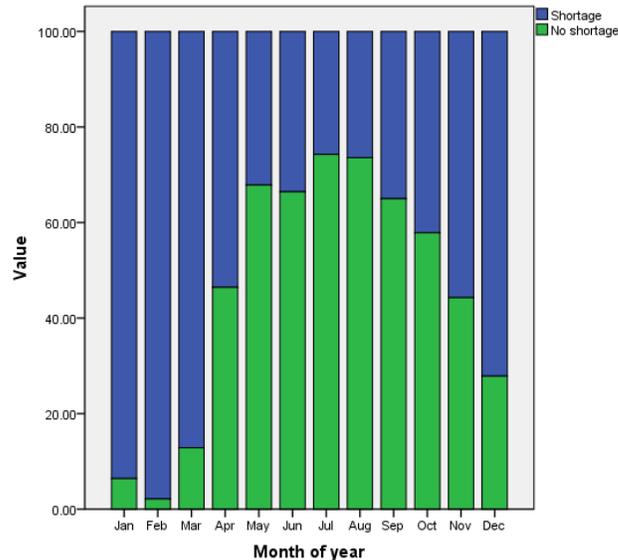


Figure 5.2 shows the percentage of households that struggle to find sufficient food for their families, from any source, by month.

Figure 5.2 Food deficit months



As can be seen in Figure 5.2, January through March is a period of food deficits for over 90% of households. This corresponds to the period when they obtain most of their food from off-farm sources. However, a large percentage of households deal with food insecurity throughout the entire year. Even in the more food secure months of May through September, more than one-quarter of households report food shortages.

Food Security Index

The food security index was created based upon the number of months households’ reported having difficulty getting food from any source in a typical (i.e. non-drought) year. This could include food from their own farm or stores, from gifts, or through purchases, food aid or transfers. Only 2 households reported being food secure throughout the year (Table 5.3). Just over one-half of households are food insecure for over 6 months of the year. Another one-quarter struggle to feed their families for 5-6 months, and 18% reported 3-4 hunger months.

Table 5.3 Food Security Index

Number of food deficit months	% of households
More than 6	53
5-6	24
3-4	18
1-2	4
No food deficit months	1

6.0 Land and Water

Ninety-one percent of the respondents had no source of agricultural water on their farms (Table 6.1). One water harvesting tank, 4 dams/water ponds, and 3 inlet/watergates were recorded.

Table 6.1 Water sources for agriculture on-farm

On-farm agricultural water source	% of households
Tanks for water harvesting	1
Dams or water ponds	3
Boreholes	3
Inlet/watergate	2
None of the above	91

Land use

Eight out of the 140 surveyed households owned no land. Just over one-half reported owning less than one hectare of land, and 39% own between one and five hectares, and none had more than 5 hectares. Only one household rented in some land.

Table 6.2 Land ownership

Land size/ownership	% of households
No land	6
Less than one hectare	56
Between 1 and 5 hectares	39
More than 5 hectares	0

Communal lands. When asked about their use of communal lands, many (41%) said they do not make use of communal lands, while 23% reported using communally-owned land for grazing their livestock, and 5% used it for growing crops and 9% for trees.

Planting trees. All the survey households reported planting between one and 10 trees in the last year, and 119 said they had protected some trees on their farms. However, only one household said they had purchased or produced tree seedlings during the last year.

7.0 Inputs and Credit

Crop production is very low-input in Borana. Only a few households had used any purchased certified/improved seeds in the last year (Table 7.1). None had used purchased chemical fertilizers. However, most (84%) had purchased veterinary medicine.

One household reported that they had hired a tractor, and two households had hired some farm labour, but most are using no hired help.

Table 7.1 Input use in the last year

Inputs	Percent of households
Improved/certified seeds	3
Chemical fertilizers	0
Pesticides/herbicides	7
Veterinary medicine	84
Credit for agricultural activities	1

8.0 Climate and Weather Information

Respondents were asked if they had received weather or climate-related information in the last year, what it was, and the source of the information. Sixty-four percent of households had heard some kind of weather/climate related information over the past 12 months.

Table 8.1 shows what types of weather-related information these households are getting, and shows that almost all households receive no weather forecasts (short or longer term), or forecasts of pest or disease outbreaks. For those few that do, they report being able to make use of any additional information that accompanies the forecasts.

Table 8.1 Type of weather-related information received and used

Type of information	% of households receiving information	% of those households also receiving advice with information	% of households receiving advice that were able to use it
Forecast of extreme event	54	21	81
Forecast of pest or disease outbreak	1	50	100
Forecast of the start of the rains	17	38	100
Forecast of the weather for 2-3 months	3	25	100
Forecast of the weather 1-3 days	2	67	100

Just over one-half are receiving forecasts of extreme events such as drought. Of those hearing extreme event forecasts, one-fifth said they also receive additional information/advice on how to make use of this information, and most were also able to use that advice.

Seventeen percent of households hear forecasts on the timing of the start of the rains, but only 38% of those households also receive advice on actions they could take in order to make use of this information.

It appears that more men than women are receiving weather information in Borana (Table 8.2).

Table 8.2 Gender breakdown of different kinds of weather-related information

Type of weather-related information	Of those households accessing this type of information:		
	% of households reporting women receiving this information	% of households reporting both women and men receive this information	% of households reporting only men receive this information
Extreme events	7	13	79
Pest or disease outbreak	0	0	100
Start of the rains	13	29	58
Weather for the next 2-3 months	25	50	25
Weather for the next 2-3 days	0	33	67

8.1 Sources of weather-related information

Around one-half of the respondents received some forecast information regarding extreme events. 74% of these households reported getting this information from traditional sources, 23% from the radio and 2% from friends and relatives. Thirteen respondents reported using the advice that accompanied the forecast to change some aspects of their farming practices - for 5 of them, this involved a change in the timing of their farming activities, 3 made changes in land management, and 3 reported changes in water management practices.

Forecasts on the start of the rains were received by 17% of respondents. This information came from traditional sources in 78% of these cases, radio in 16%, and from friends and relatives in 2 instances. Nine of these households also received and used additional advice with the forecast. Based on that advice, households changed their land management practices, crop type, crop variety, and the timing of farming activities.

Very few households are receiving weather forecast (short or longer-term) information at all, and only one or two hear it over the radio; most are relying on traditional sources or friends and family.

9.0 Community Groups

About half of the respondents were not member of any kind of agricultural-related groups. Half belong to one or more groups (Table 9.1).

Table 9.1 Group membership

Type of Group	Responses	Percent of Cases
	n	
Tree nursery/planting group	2	1
Water catchment management group	12	9
Soil improvement activities group	3	2
Irrigation group	3	2
Savings or credit group	34	24
Agricultural product marketing group	18	13
Productivity enhancement group	25	18
Other agricultural/natural resource management-related group	10	7
Not a member of any group	68	49

For one-quarter of the cases, someone in the household belongs to a savings and credit group, 18% to an agricultural productivity enhancement group, and 13% belong to an agricultural marketing group. Only a few households are members of groups involved in tree nurseries or tree planting, soil improvement or irrigation activities. Nine percent of households are members of a water catchment group, however.

Water catchment and soil improvement-related groups are male-only groups. 71% of the households who belong to a savings and credit group, 89% to agricultural marketing groups, and 80% to agricultural productivity enhancement groups are male-headed. 46% of the male-headed and 56% of the female-headed households were not a member of any group.

9.1 Climate-Related Crisis

116 households, or 83% of respondents, reported that they had faced a climate-related crisis in the last five years, and only 15% of them received some type of assistance at the time. In 88% of these cases, the assistance was received from the government.

10.0 Assets

One-quarter of households had some type of improved storage facility for grain. None reported having electricity, running water, improved housing/roofing, or a water storage tank for domestic water.

Asset Indicator

An asset indicator was developed for cross-site comparison reasons and in order to track changes over time (Table 10.1). Households were asked what assets they own, from a set list. The assets they were asked about include the following: Energy-related: generator, solar panel, biogas digester, liquid petroleum gas; Information-related: radio, television, cell phone, internet access, computer; Production means: tractor, mechanical plough, thresher, boat, fishing nets, mill; Transport: bicycle, motorbike, car or truck; Luxury items: fridge, air conditioning, fan, bank account, improved stove.

Three households own a bicycle, two have a bank account, and only one household owns a mechanical plough. None has an improved (non-traditional) stove.

Only 19% of households reported owning a radio, but 30% now own a cell phone.

Because a full enumeration of livestock holdings was beyond the scope of this baseline survey, this indicator does not include a key asset for pastoral and agro-pastoral households, i.e. livestock.

Table 10.1 Asset indicator

Inputs	Percent of households
No Assets	62
1-3 assets	37
4 or more assets	1

Sixty-two percent of surveyed households had none of the assets listed in the questionnaire. Only one household owned 4 or more.

Appendix 1: Survey Process and Implementation

In CCAFS's learning site in Borana, the unit of analysis for the baseline survey was the household. Households that were interviewed were selected through a rigorous sampling scheme that involved a three layer hierarchical multistage sampling procedure including: the Block, the Villages, and eventually the Households. The procedures that follow explicitly describe how these sampling techniques were conducted.

Block Selection

In the CCAFS household survey manual the sampling requires 3 layers in a hierarchy: a 10 x 10 km block, villages within a block (7) and households within each village (20). For Borana pastoral site, however, given the low population density and large distance between settlements, a 30x30 km block was chosen to select villages for the survey.

In consultation with the CCAFS team in Nairobi and further consultation with the Borana zone Pastoral Development Office and Land Use and Environment Office, the survey block was agreed to be located in Yabello and Arero weredas which are geographically bordering and adjacent to each other. The selection of the block was based on the criteria set in the CCAFS survey manual. It was expected that the block should have the following features:

- Represent research sites under different institutional arrangements.
- Have contrasting climate-related problems and opportunities for intervention.
- Have high potential sites where community members will produce impact and accept to enhance up scaling.
- Have key social economic issues including urbanization and gender participation.
- Have evident participation of local and political leaders to scale up the generated results as well as ensure the sustainability of the project result(s).
- Have active presence of NGOs, research organization(s) as well as community based organization(s) to facilitate the scaling up of the project activities and safe to work in and be accessible by the project team.

The selected block has several international, national and local NGO's supporting pastoral and agricultural related activities, including CARE, SC/US, Action For Development (AFD), Gayo Pastoral Development Initiative (GPDI), SOS-Sahel and many others. The government also has several pastoral development activities including water development, pasture improvement and dry-land farming. The Oromia Agricultural Research Institute, Yabello Dry-land and Pastoral Research Center and the Pastoral College are also located in Yabello town, less than 30 km from the block. Both Yabello and Arero weredas were part of the PARIMA study site and they have longitudinal data on socio-economic variables that can be used by CCAFS in the future. Yabello was also one of the PARIMA Outreach Action Research sites.

A reference point was picked randomly along the Yabello-Arero dirt road to demarcate the 30x30 block. The 30x30 block begins about 30 km east of Yabello town on the Yabello-Arero road and goes about 18 kms inside the territory of Arero Wereda. We used GPS and Maps from GTZ to determine the values of the coordinates. The block was named YABARE.

Village Selection

Five Pastoral Associations (PAs), two from Yabello (Dikale, and Dembelaseden) and three from Arero (Allona, Gadda and Fullduha) fell in the 30x30 km block. PA is the smallest administrative unit below the district (Wereda) administration. There are several Reeras/villages in each PA. We used the Reera, which is a traditional territorial organization for village. Some Reeras are so big that encampments could be a bit far from each other. Hence proximity of encampments and shared dry season grazing enclosure among members was used to further qualify a Reera as a village. Each Reera/village has its own dry season grazing enclosure which is managed by the village/reera leaders. These enclosures create strong bondage between the village/Reera members that influence right of access to resources and other social and economic relationships. Based on these criteria, 27 villages/Reeras in the YABARE study block were listed using key informants, PA officials and elders and leaders in the PAs. The head of the Reera and name of the dry season enclosures owned by the Reera members were also recorded. Seven villages (26% of the total villages) were selected randomly. Three of the villages were from Arero (Alona and Gadda PAs) and 4 of them from Yabello (Dembelaseden and Dikale PAs) wereda. The list of all villages in the block was used as the sampling frame, from which 7 villages were randomly selected to participate in the survey, using the table of random numbers adopted from the Statistical Package for the Social Sciences. Appendix 2 shows the villages that were selected to participate in the study.

Household Selection

The team leader, the field supervisor and the enumerators were involved in the listing of households in the selected villages. All households in the selected villages were listed and recorded. The listing was done using key informants, PA leaders, Reera leaders, elders, and Development Agents (DA) who are assigned and based in each village and team visit. For some villages, the list was counter checked against the official lists and it was found out that the list generated through the key informant and village leaders was much more accurate than the official list. When the team entered each village, it had to explain the purpose of the survey and its potential future benefit for the village itself as well as to other rural people else where in the world. This helped the team to build trust with the villagers.

Twenty households were selected at random from the list of households for each village using the sampling procedure in the survey manual. About 7% of the randomly selected households were replaced due to various reasons such as absence of the whole household from the area for a long time. They were replaced by other households and it was done by going through the same random sampling procedure as described in the manual.

Total household population in the seven selected villages from which the sample was drawn was 659 households, 549 (85%) male-headed and 110 (16%) female-headed. 140 households (21%) were randomly drawn from the sampling frame.

Team Composition

The household baseline survey team consisted of 9 members with extensive experience in administering surveys. The team was composed of lead team leader and assistant, field supervisor, four enumerators, and two data clerks.

The Survey Site Team Composition

Name	Role/responsibility
Dr. Solomon Desta	1 st Team Leader
Dr. Getachew Gebru	2 nd Team Leader
Seyoum Tezera	Field Supervisor
Ahmed Ibrahi,	Lead Enumerator
Jermi Godana	Enumerator
Jarso Doyo	Enumerator
Malicha Dida	Enumerator
Azeb Yonas	Data Clerk
Saba Abraha	Data Clerk

The team leaders and the field supervisors are members of MARIL, which is the lead organization that administered the survey. Seyoum Tezera was assigned to supervise the field survey. The following individuals were identified as enumerators. Ahmed Ibrahim who worked for PARIMA for more than 6 years as a lead enumerator, Jermi Godana a graduate in literature, Jarso Doyo a graduate student in Geography and Malicha Dida a graduate in natural resource management. Except Ahmed all are Borana. Ahmed is a non Borana but a longtime resident in Borana. Saba Abraha and Azeb Yonas were recruited to do the data entry. Both individuals worked for PARIMA as data entry and management clerk for more than 10 years. Saba was familiar with CsPro and Azeb has some idea about the software. The enumerators were selected based on their familiarity with the local culture, social fabrics, and knowledge of local language, and experience in data collection in pastoral areas.

Description of Data Collection Tools

The baseline survey manual and the questionnaire prepared by CCAFS were supposed to be used in all its study sites globally. There are, however, unique situations in each one of the CCAFS sites that require refinement and adaptation to local realities. We made few minor changes in the manual including the code sheet. For example in Borana as long as the husband is alive, no matter for how long he is away he is the household head and the household is classified as male headed household. The questionnaire was also modified by including a table as an annex to the core questionnaire to capture livestock wealth in the survey site.

The baseline survey was translated into oromifa/Borana, which is the local language in the study site by a qualified translator. It was done by a Borana woman who has an extensive experience in translating English into Borana and Borana into English. To ensure the quality of the translation, the questionnaire was back translated into English by a fluent Borana speaker and who is also very good in English.

Supervisor/Enumerator Training and Field Preparation Activities

The team leaders and the field supervisor received orientation on CCAFS program and training on the survey instrument by the CCAFS team in Nairobi, Kenya. The enumerators were then trained on the survey instrument by the MARIL team leaders. It was a one full day training which involved explanation of the survey instrument and practicing, awareness on ethical issues, facilitation skill, verbal communication skill, respect, trust. The translated questionnaire along with the English version was used in the training of the enumerators.

All the necessary field preparation was made before heading to the survey site. The survey site is located 600 km from Addis Ababa.

Data Collection Procedures

Appointments were made with survey respondents who were asked to wait for the team in their houses and plan for one to one and half hours for the interview. The field supervisor and the team leader participated in the data collection process. Data collection and checking was done for each village before moving to the next village. While the enumerators were interviewing the respondents, the field supervisor had to walk through the villages to take the GPS readings of each household. For the first few household interviews, the team leader and the field supervisor had to sit with each enumerator to ensure that the enumerators have really understood the questionnaire and behave properly when approaching and interviewing respondents. This helped to ensure data quality. Village elders, PA leaders, DAs and in some villages even teachers helped the team to locate sample households and to convince respondents to cooperate.

Data Entry Procedures and Analysis

Data was entered using CSPRO data entry software. The data for HBS and the livestock annex were entered and saved in separate files. It was double entered using two independent data entry clerks. The clerks received training on the software by an expert from the CCAFS regional Office.

The preliminary data cleaning was done by the expert from CCAFS, ably assisted by the field supervisor. Comparison of the two datasets was made repeatedly until they matched, and then the data were uploaded on the CCAFS site. Further cleaning was done by the field supervisor before the data were exported to SPSS for final cleaning work. The clean data set, in CSPRO and SPSS, for both the HBS and the livestock annex, was then uploaded on the CCAFS web site.

Appendix Two: Randomly selected villages for the baseline study

	Village Selected	Wereda/district
1	Dembela Abachena	Yabello
2	Dembela Seden	Yabello
3	Dembi	Yabello
4	Harawatu	Yabello
5	Kubiano	Arero
5	Bulle	Arero
7	Gada	Arero