



**CGIAR Research Program
Climate Change, Agriculture and Food Security (CCAFS)**

**Summary of Household Baseline Survey Results:
Kaffrine, Senegal**



December 2011

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Published by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS).

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Acknowledgments

We would like to thank all the surveyors for the commitment and hard work on the field and the population of the villages for their hospitality and collaboration during the survey. We sincerely would also like to thank the “l’Institut Sénégalais de Recherches Agricoles (ISRA)”, the « Institut du Sahel » (INSAH/CILSS) and the Climate Change, Agriculture and Food Security (CCAFS) research program. Last but not at least, thanks to all those who have contributed to survey.

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Summary

This report presents the results of household baseline survey carried out in Kaffrine site (Senegal) in January 2011, within the framework of the CGIAR research program on Climate Change, Agriculture and Food Security (CCAFS). The objective of the survey was to gather baseline information at the household-level about some basic indicators of welfare, information sources, livelihood/agriculture/natural resource management strategies, needs and uses of climate and agricultural-related information and current risk management, mitigation and adaptation practices. 97% of the households are headed by a man. Household members of working age represent 71% of the total population. Approx. 34% of the households reported a member with at least a primary education level. Agriculture and livestock remain the most important economic activities and the source of livelihood. Major crops are millet, maize and peanuts. More than half (80.4%) of the households reported land area of more than 5ha for agricultural purposes. Inputs use such as fertilizers and pesticides is very limited. Agricultural production is diversified with more than 90% of the households cultivating 5-9 crops. However the level of diversification in terms of commercialization is low. Most of the on-farm production is destined to household consumption. The main incomes sources are business (19.9%), employment on other farms (14.7%) and formal/informal loans (26.2%). The households have reported several changes in crop and livestock farming and management. Approx. 57% of the households reported changes in cropping system (introduction of new varieties, land management, inputs use, and timing of agricultural activities, etc.). These changes were mainly driven by market, land, and climate change and labor reasons. Changes have also been reported in livestock management (introduction of new breeds, animal feeding and management). The causes of these changes were also related to market, climate change, pests and diseases. Food security is of concern in the area as results showed that 94.2% of the households surveyed are food insecure throughout the whole year. Regarding weather and climate information, more than 90% of the households reported receiving some kind of information, mostly forecast on extreme events, start of the rainy season, on pests/diseases, for 2-3 days and 2-3 next months. Men are the primary recipients of the weather and climate information through mainly the radio, televisions, as well as friends, relatives, NGOs and projects. Agricultural advises and recommendations are being used by the households. Group membership is very important and the most dominant are the saving/credit and agricultural products marketing groups. The main assets found are radio, mobile phone and bicycle.

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1. Introduction

The CCAFS program is a strategic ten-year partnership between the CGIAR and the Earth System Science Partnership to help the developing world overcome the threats posed by a changing climate, to achieving food security, enhancing livelihoods and improving environmental management. It brings together the world’s best strategic research in the fields of agricultural science, development, climate science and earth systems science to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. As a collective effort, the CCAFS program aims to become a hub that facilitates action across multiple CGIAR centers and research programs, as well as involving farmers, policy makers, donors and other stakeholders. Their knowledge and needs will be integrated into the tools and approaches that the CCAFS’ program develops.

This report presents the results of the household baseline survey conducted in January 2011 in Kaffrine site (Senegal) (Figure 1). The objective of the survey was to gather baseline information at the household level about some basic indicators of welfare, information sources, livelihood/agriculture/natural resource management strategies, needs and uses of climate and agriculture-related information and current risks management, mitigation and adaptation practices. The questionnaire and training materials associated with it, including data entry and management guidelines can be found at <http://ccafs.cgiar.org>

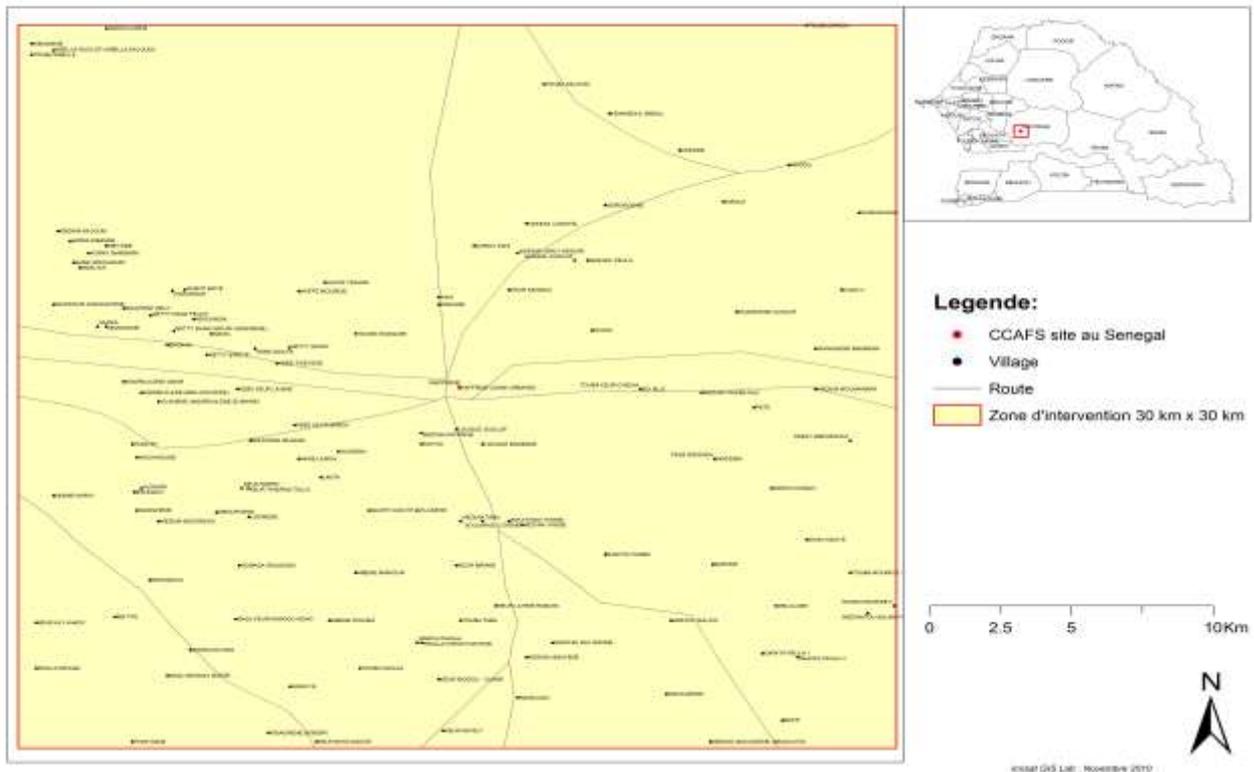


Figure 1. Location of Kaffrine site

The questionnaire was structured around the following key sections:

- 1. Household respondent and type
- 2. Demography
- 3. Sources of livelihood
- 4. Crop, farm animals/fish, tree, soil, land and water management changes
- 5. Food security
- 6. Land and water
- 7. Inputs and credits
- 8. Climate and weather information
- 9. Community groups
- 10. Assets

2. Household respondent and type

2.1. Household respondent

Of the households surveyed, 85% of respondents were men and 15% of women. Households head by men (married, single, divorced or widowed) represent 97% of the total household, while women household heads account for 3% only.

2.2. Types of household

The average household size was 14 members. Approx. 44% of the households reported more than 10 members, 44% reported between 4-9 and 12% have 3 individuals per household. Figure 2 and 3 show respectively the proportion of household member of non-working age (younger than 5 and older than 60 years) and household members of working age (between 5 and 60 years). There are approx. 83% of the households with less than 40% of members aged <5yrs or >60yrs. In more than half (59%) of the households, members of working age (between 5 and 60 years) represent between 60-80%.

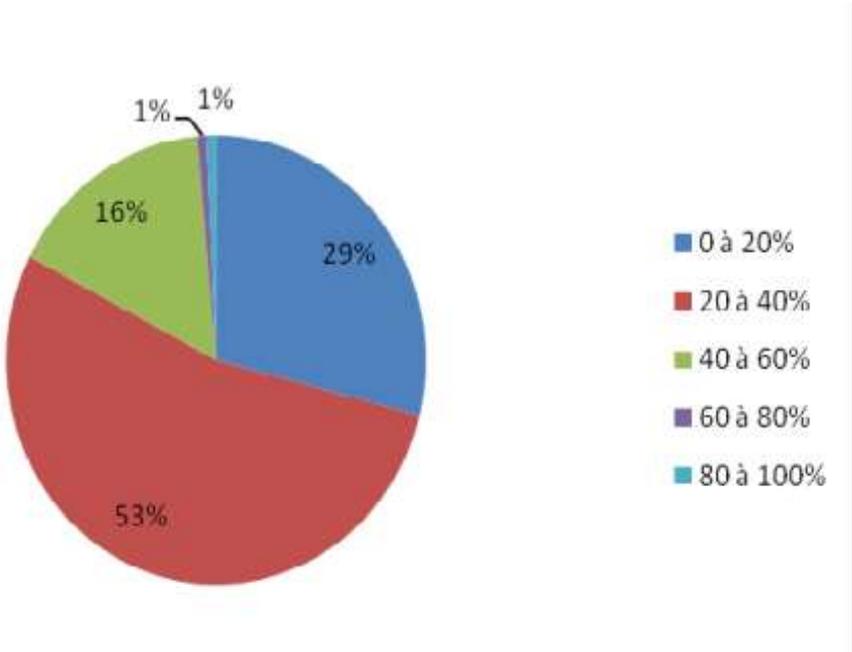


Figure 2. Percentage of people of non-working age

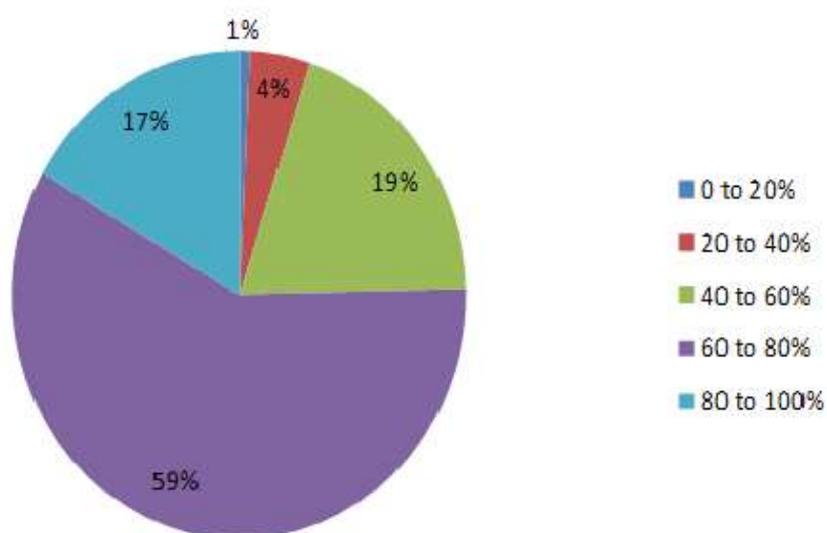


Figure 3. Percentage of people of working age

The population of working age (5-60 years) of the households surveyed represents 71% of the total population of the site (Table 1).

Table 1. Proportion of the population of working age

Age group	Population	%
< 5 years	435	23.3
5 à 60 years	1319	70.6
> 60 years	113	6.1

2.3. Education level

Table 2 provides information on the educational level of the households surveyed. Approx. 34% of the households reported having at least one member with a primary education, while 19% reported a member with a secondary education level. About 46% of household have no member with a formal education.

Table 2. Household education level

Level of education	Household	
	Number	%
No formal education	64	46.4
Primary	47	34.1
Secondary	26	18.8
Post-secondary	1	0.7

Table 3. Highest education level and household size

Level of education	Household 1-3 pers		Household 4-6 pers		Household 7-9 pers		Household 10 +	
	No	%	No	%	No	%	No	%
No formal education	17	27	14	21.9	18	28.1	15	23
Primary	0	0	3	6.4	11	23.4	33	70.2
Secondary	0	0	0	0	1	3.8	25	96.2
Post-secondary	0	0	0	0	0	0	1	100

3. Sources of livelihood

3.1. On-farm livelihood sources

The figure below highlights household's production, consumption and sale of agricultural products at the farm level. Subsistence agriculture remains the main economic activity of production and source of livelihood. Major crops cultivated are millet and maize. Agricultural production is diversified with an average of 87% of the households surveyed that produce 7-9 crops, while 2% of the households produce 10 and more crops. Of the households surveyed, 29% reported producing cash crops. Fruits, legumes are being produced also. Livestock (large and small ruminants) rearing is also an important activity that contributes to food security and livelihood.

Regarding the sales, about 87% of households reported selling some cereals and also 71% said that they sell small livestock. 27% of the households reported selling legumes.

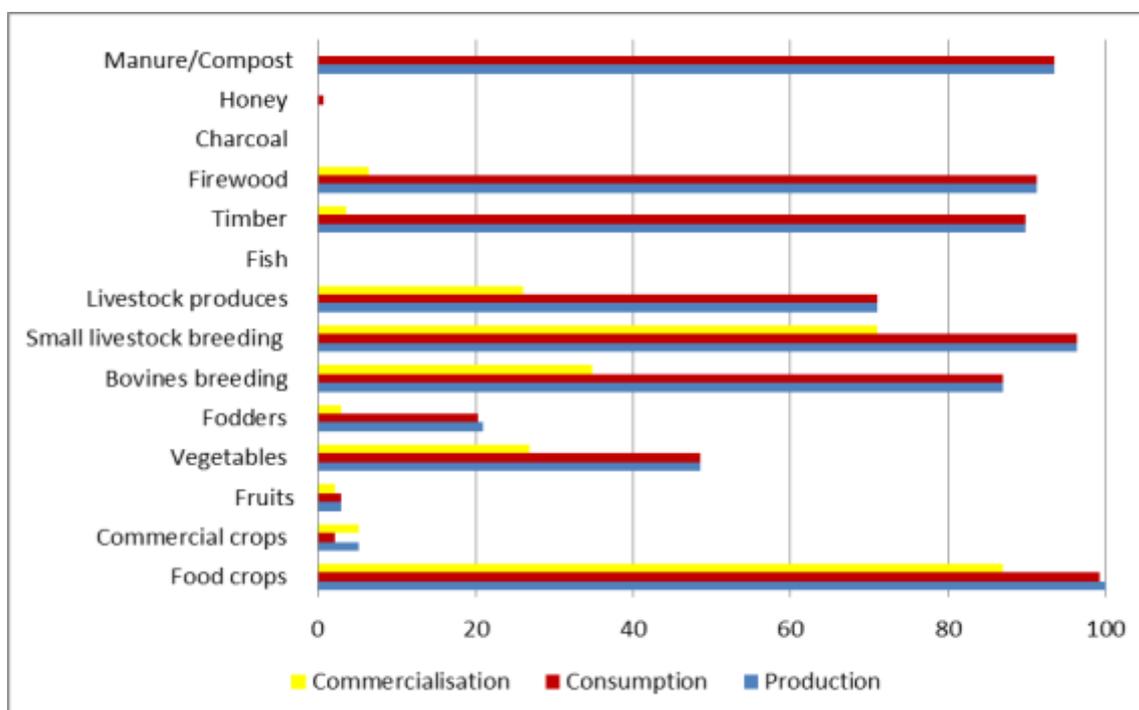


Figure 4. Percentage of households producing, consuming and selling of various agricultural products from their own farm

3.2. Off-farm livelihood sources

Approximately 67% of households consume 2-3 off-farm products, while 32% reported 4-6 products. Fruits and fish are consumed. Very few households are engaged in off-farm products trade for their livelihoods. Products sold are fruits (5.7% of households) and fodder (1.4% of households). The figure below gives the proportion of households involved in sales and consumption of off-farm products. Most of the off-farm products are consumed by the households.

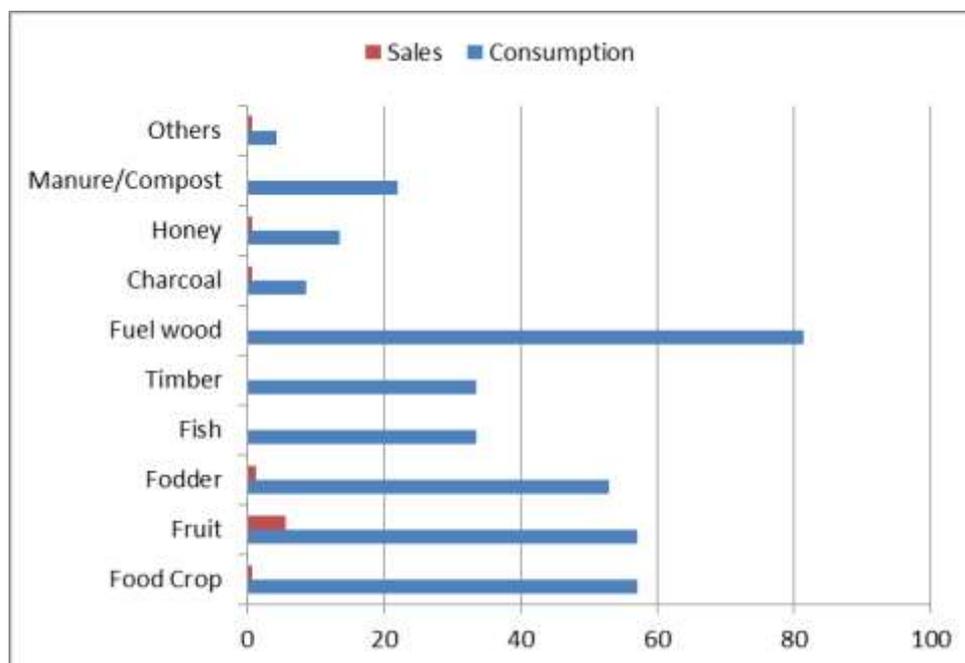


Figure 5. Percentage of households producing, consuming and selling of various off-farm agricultural products

3.3. Diversification indices

A production diversification index was created by adding up the total number of agricultural 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)

Regarding the selling/commercialization, the total numbers of agricultural 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 the diversification indices are shown in Table 4. About 53.6% of the household surveyed have a high production diversification index, while 45.7% of households have a high level of production diversification index. Regarding the commercialization, 63% of the households have an intermediate commercialization index, while 28.3 show an intermediate commercialization index and only 8% have a high commercialization index.

Table 4. Diversification indices

Production diversification	% of households
1 product	0.7
2 or 3 products	53.6
4 or 6 products	45.7
Selling/commercialization	
No product	0.7
1-2 products	28.3
2-3 products sold	63
4-6 products sold	8

3.4. Farm labor: who does most of the work on and off-farm

The figures below show the distribution of tasks (work) within and outside the farm. The majority of the household tasks are the responsibility of the men (38% of household responses), while for 20% of the households, workload is equitably shared among household members. Women bear only little of the on-farm workload (7% of responses).

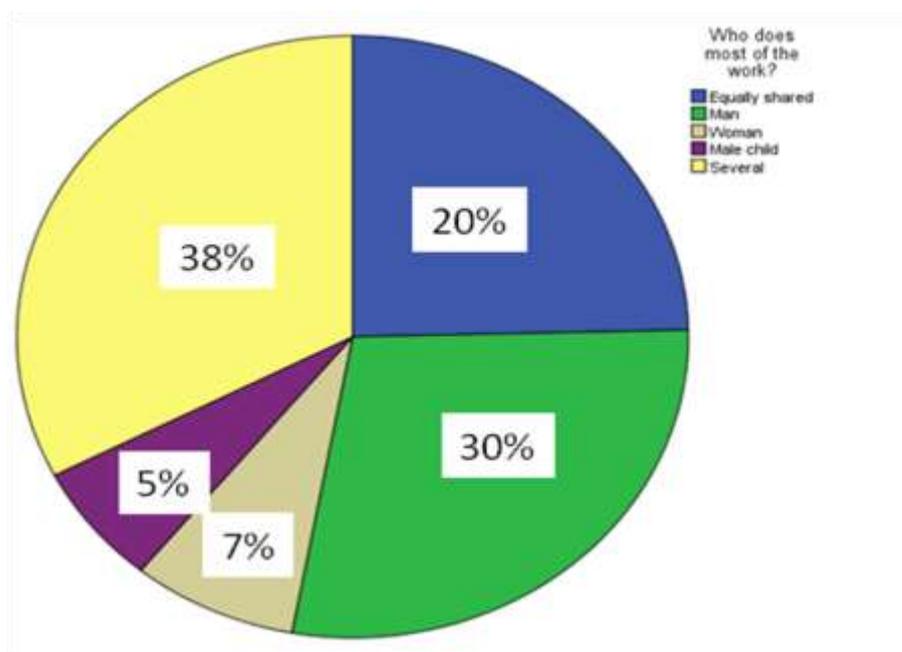


Figure 6. On-farm labor responsibilities

Regarding the workload off-farm, 37.5% of the households reported that women bear a lot of the off-farm work, and only 18% indicated the role of men in this regard.

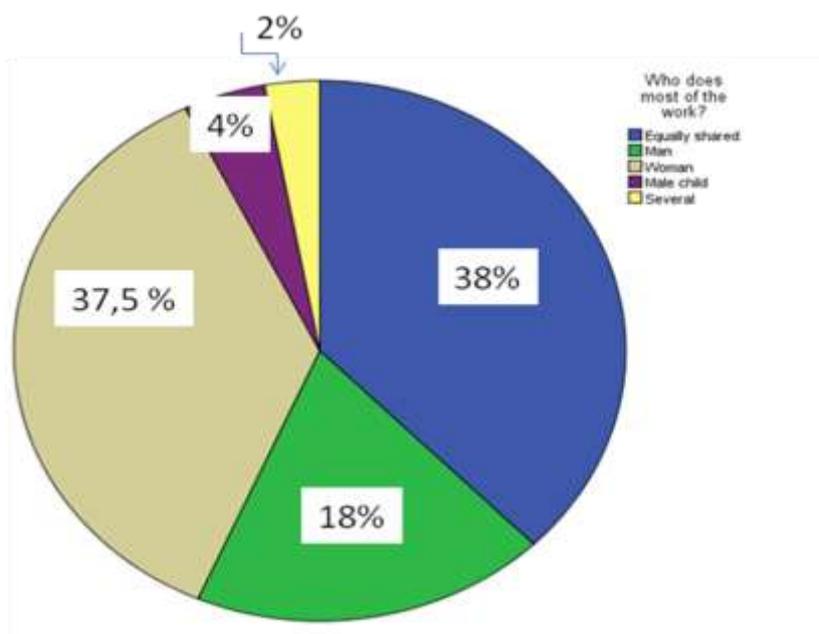


Figure 7. Off-farm labor responsibilities

3.5. Sources of cash incomes

The table below shows the different household's income sources. Loan/credit (formal and informal), business and employment on other peoples' farms are the main sources of cash income at household level.

Table 5. Sources of cash incomes

Sources of cash incomes	% of households
Employment on someone else's farm	14.7
Other employment	7.2
Business	19.9
Remittances or gifts	12.4
Payment for environmental services	
Payment from projects/Government	11.5
Loan/Credit from formal source	7
Loan/Credit from informal source	19.2
Renting out farm machinery	5.9
Renting out your own land	1.8
No other source of cash	0.5

4. Crop, farm animals/fish, tree, soil land and water management changes

4.1. Crop-related changes

Approximately 57.2% of households indicated changes in their farming system over the past decade, with at least three new crops/varieties introduced, while 30.4% reported 1-2 varieties introduced and 12.3% indicated that they haven't introduced any new variety.

Table 6. Adoption of new crops varieties during the past ten years

Changes of practices	% of households
No varieties introduced	12.3
1-2 new crops/varieties introduced	30.4
3 and more crops/varieties introduced	57.2

Other changes have been reported over the past ten years:

- Changes in land management (reported by 33.3% of households)
- Changes in agricultural activities (reported by 23.8% of households)
- Changes in crop cultivated (reported by 19%)
- Approx. 4.8% of the households surveyed have not made any changes
- 4.8% of households have indicated changes in inputs use (fertilizers, seeds and pesticides). 65.2% of the households reported no changes made in agroforestry while 34.8% reported some changes.

The tables below summarizes the different changes made.

Table 7. Changes in farming practices over the past decade

Changes	% of households
None	4.8
Land management	33.3
Crop types	19
Variety types	4.8
Inputs use	4.8
Land rent	9.5
Timing of agricultural activities	23.8

Table 8. Changes in land allocation and trees management

Changes	% of households
<i>Changes in soil management practices</i>	
None	1.4
1 change operated	6.5
3 or more practices in soil management	92
<i>Tree/agroforestry management</i>	
No change	65.2
Some changes	34.8

Reasons for crop-related changes

When asked about the reasons for these changes, market, climate change, land, labor, and projects were listed by the respondents. Approx. 89.6% of households indicated markets as the major cause de changes over the past ten years. The table below provides the main reasons and percentage of household that reported these reasons.

Table 9. Reasons for crop-related changes

Reasons for changes	% of households that have reported these reasons
Markets	89.6
Climate	25.2
Land	61.5
Labor	47.4
Diseases/pests	3
Projects	10.4

4.2. Livestock-related changes

Concerning livestock, few changes have been operated by the households, with few instruction/adoption of new breeds. Approx. 83.3% of the households surveyed indicated that they have introduced at least 1 new animal in their herd over the past ten years, while 2.9% still have the same animal. Only 12.3% have introduced 2-3 new breeds over the past ten years. The table below summarizes livestock-related changes.

Table 10. Household that have introduced new breed

Adoption of new breed	% Households
None	2.9
1-2 new breed introduced	83.3
3 or more breed introduced	12.3

Table 11. Changes on animal breed

Changes	% of households
No animal	0.7
1 breed (same over the past ten years)	2.9
1 breed (different over the past ten years)	0.7
2-3 breeds with at least 1 being different over the past ten years	83.3
2-3 breeds with at least 2 being different over the past ten years	12.3

Table 12. Livestock-related changes

Changes in herd management	% of households
None	10.1
1 – 2 changes	86.2
3 and more changes	3.6
<i>Changes in animal management</i>	
None	63
Change in 1 animal management	33.3
Changes in 2 or more animals management	3.6
<i>Adoption of new breeds</i>	
None	55.8
1-2 new breeds introduced	40.6
3 or more breeds introduced	3.6
<i>Feeding</i>	
None	25.4
Change in feeding of 1 animal	53.6
Change in feeding of 2 or more animals	21

Reasons of livestock-related changes

The reasons provided of livestock-related changes are shown in the table below. Market, climate change and animal diseases outbreaks are the major causes/reasons listed for livestock-related changes. Among the households surveyed, 73.9% have indicated market as the main cause of changes in livestock related changes (Table 13).

Table 13. Reasons of livestock-related changes

Reasons	% of households
Markets	30.4
Weather/climate	6.5
Labor	8.3
Pests/diseases	54.4

5. Food security

5.1. Food sources

The figures below provide information on the main food sources (on and off-farm) as well as the periods of abundance and shortage.

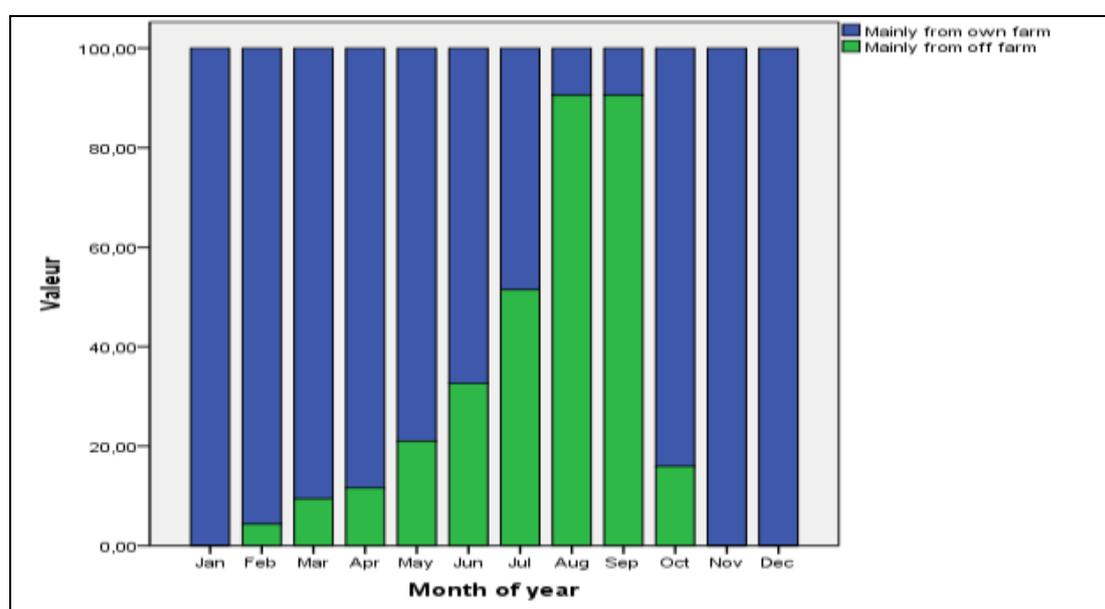


Figure 8. Household food main sources

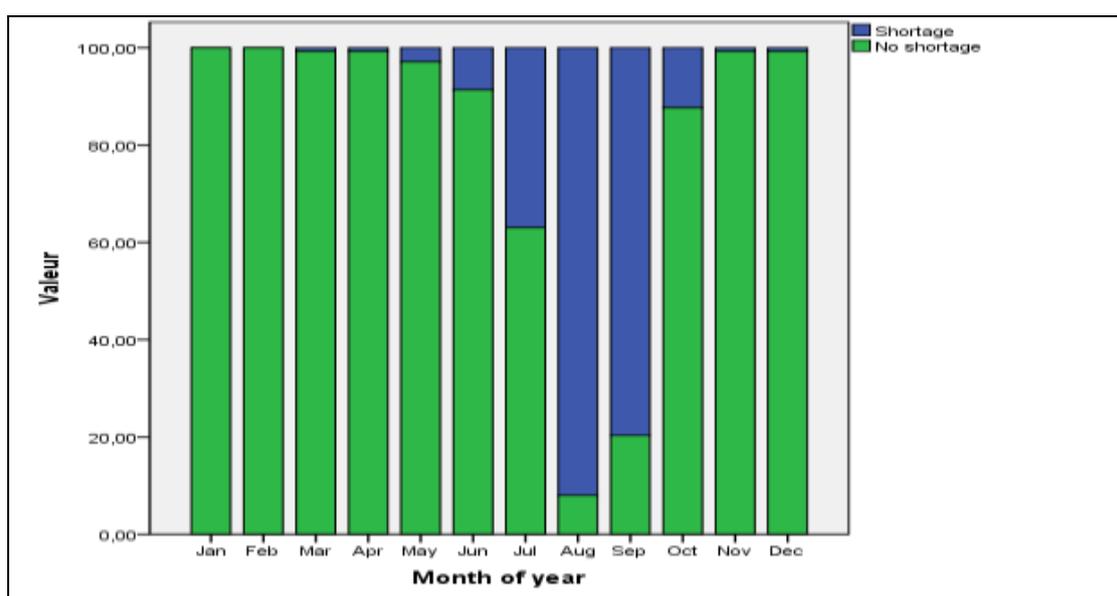


Figure 9. Household food shortage and no shortage periods

On-farm agricultural production constitutes the main source of household food throughout the year, with the months from May to June whereby off-farm production contributes also to ensuring food security. In the period from July to August, households experienced food shortage.

Food security Index

The food security index we created is based upon the number of months that the household has difficulty getting food from any source (i.e. from their own farm or off-farm, from stores, gifts, purchases or transfers). Table 14 below shows that only 5.8% of households surveyed were able to meet their annual food needs, while 81.9% of the households could secure food during 7-11 months and 12.3% less than 7 months.

Table 14. Food security Index

Percentage of sampled households		
< 7 months food secure	7 - 11 months food secure	12 months food secure
12.3	81.9	5.8

6. Land and water

6.1. Water for agriculture

Table 15 shows the sources of water for agriculture (not for domestic purposes). Approx. 83.4% of households do not use any of the following sources (irrigation, reservoirs, dams, wells and pumps). They rely on rainfall for agricultural water.

Table 15. Water sources for agriculture

Water Sources	% of household
Irrigation	6.2
Tanks for water harvesting	1.4
Dams or water ponds	0.7
Boreholes	2.1
Pumps	6.2
None of the above	83.4

6.2. Land use

The land available for each household includes both land that is owned by the household and land that is rented. Table 16 shows average land available per household. Approximately 80.43% of households own over 5 ha of land, while 17.4% reported land area of 1-5ha. 42.6% of the households said they don't use communal lands, while 35.6% reported using these lands.

Table 16. Land available per household

Land owned/rented	% of household
1-5ha	17.4
> 5ha	80.4
Area allocated to crops	
< 1ha	0.7
1-5ha	34.8
> 5ha	63

Table 17. Use of communal lands

	% of household
Communal land accessible	35.8
Land for crops	20.5
Bush land	1.1
Do not use communal lands	42.6

7. Inputs and credit

Approx. 34.7% of the households indicated that they have used some veterinary products, while 29.4% have bought some fertilizers and 22.1% of households used some pesticides. Seeds are collected from the production.

Table 18. Purchase of inputs over the past 12 months

Type of input	% of households
Seeds	7.4
Fertilizers	29.4
Pesticides	22.1
Veterinary medicine	34.7
Credit for agric. activities	5
None of the above	1.5

NPK is the most used fertilizer (31.6% of households reported using this fertilizer) on maize crop field.

Table 19. Types of fertilizers used

Fertilizers	% of households
Urea	17.4
NPK	31.6
DAP	0.1
Other types (not listed)	0.2
None	50.6

8. Climate and weather information

An analysis of which households are receiving any type of climate or weather-related information shows that approximately 90% of households reported receiving some information on climate/weather.

8.1. Who is receiving weather related information?

All household members (men and women) reported receiving some information, but in general, men do have more access than women to the information.

8.2. Types of information

The main types of information received are forecasts of extreme events (droughts, floods), the start of the rainy season and the weather forecast (2-3 days and 2-3 months).

Table 20. Gender breakdown of different kinds of weather-related information

Type of information	% of HHs reporting that men are receiving the information	% of HHs reporting women are receiving the information	% for the all members
Extreme events	33.3	0	66.7
Pests & disease out break	22.2	0	77.8
Start of the rains	44.7	1.6	53.7
Weather for the next 2-3 months	42.4	2.2	55.4
Weather for the next 2-3 days	42.5	1.7	55.8

Forecast of extreme events

Results show that 15.2% of the households surveyed received information on extreme events (droughts, floods). In 2/3 of the cases, all family members receive the information and 81% of the households reported recommendations that followed up the information. 59% of the households indicated that they used the recommendations. The recommendations resulted in changes in land management (reported by 33.3% of households), timing of agricultural activities (23.8%) and the types of plants and varieties (23.8%).

Radio, TV, rural development directorates, projects and NGOs are the main sources of information.

Table 21. Extreme weather sources of information

Source of information	Number of responses	%
Radio	21	60.0
Television	2	5.7
Rural development directorate	1	2.9
NGOS and Projects	1	2.9
Friends and neighbors	2	5.7
Meteo	6	17.1
Newspapers	35	5.7

Forecast on diseases/pests

Of the households surveyed, only 6.5% reported receiving some forecast on diseases last year. Radio remains the main source of information (56.3%), then TV (12.5%), NGOs and projects (12.5%) and friends and neighbors. The forecast is received by all households members (77.8% of the households reported that) and is followed by recommendations/advises that are used by the vast majority (71.4%).

Table 22. Actions undertaken following the forecast on pests/diseases

	% of responses
None	16.7
Land management	33.3
Types of plants	16.7
Inputs use (seeds, fertilizers and pesticides)	33.3

Forecast of the start of the rains

About 90% of the households received information on the beginning of the rainy season last year. Radio was the primary provider for this kind of information, as reported by 57.5% of the households. The use of mobile phone (6.6% responses) and indigenous knowledge (0.9%) is becoming widespread.

Table 23. Source of information on the start of the rains

Source of information on start of the rains	% of households
Radio	57.5
Television	5.2
Rural development directorates	2.4
NGOs and projects	11.8
Friends and neighbors	4.7
Meteo	9.4
Newspapers	1.4
Local forecast/local knowledge	0.9
Mobile phone	6.6

For those who received this type of information, 82.1% said that they use it to decide on land management (44.4%), the start of planting (21.1%), the choice of varieties (15.5%) or the type of crops (7.7%).

Forecast for the next 2-3 next months

Approx. 67% of households stated that they received information on the rainy season and that the information helps them decide on the types of crops/varieties to grow. On the sources of this kind of information, 52.3% of the households mentioned the radio, 13.2% mentioned the meteo, and 11.5% indicated NGOs and Projects. Some recommendations follow the information. The households reported the following changes after the forecast of the 2-3 next months.

Table 24. Aspects of farming changed with 2-3 month forecast information

Aspects of farming changed with 2-3 month forecast information	% of households
None	5.3
Land management	43.6
Crops types	6.8
Variety types	27.4
Inputs	0.8
Manure use	4.5
Land rent	2.3
Planting period	21.8

Forecast for next 2-3 days

Approx. 87% of the surveyed households received short-term weather forecast information, through radio (58%), NGO (12.2%) and meteo service (10.2%). With this information, changes were operated by households regarding land management (48.2%), planting period (21.2%) and varieties choices (14.6%).

9. Community groups

Respondents were asked if someone in the household was a member of an agricultural or natural resource management related group. Approx. 70.3% of the households reported at least a member affiliated to a community group.

Table 25. Group membership

At least one member belong to the group	% of households
Trees nursery	0.6
Irrigation	1.7
Introduction/substitution of crops	0.6
Saving/Credit	22.1
Commercialization of agr. products	16.9
Agricultural productivity improvement	3.5
Seeds production	1.2
Legumes production	1.2
Other group not mentioned	22.7
None	29.7

10. Climatic crises

Several climate crises have been reported over the last 5 years. Some households have received aid, others not. Approx. 90% of the households surveyed reported natural disaster and only 40% have been assisted.

Table 26. Sources of assistances

	% of households
Friends	54.4
Government	5.1
NGO	8.9
Religious Organizations	5.1
Membership group affiliated to	26.6

11. Assets and capital

Households were asked about household assets they had, from a set list. The total number of assets in all categories was added up and the following asset indicator created:

0=no assets (basic level)

1=1-3 assets (intermediate level)

2=4 or more assets (high level)

59.6% of the households surveyed reported no asset. Approx. 40% reported 1-3 assets. The most common assets are radio, mobile phone, cart, and bicycle and belong mostly to men.

Table 27. Assets indicator

Number	% de ménages
None (basic)	59.6
1-3 assets (intermediate level)	40
4 and more (high level)	0.4