



RESEARCH PROGRAM ON  
**Climate Change,  
Agriculture and  
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**CGIAR Research Program on  
Climate Change, Agriculture and Food Security (CCAFS)**

# **Baseline Household Survey Results: Xai Xai District, Mozambique**

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**R. Dixon**



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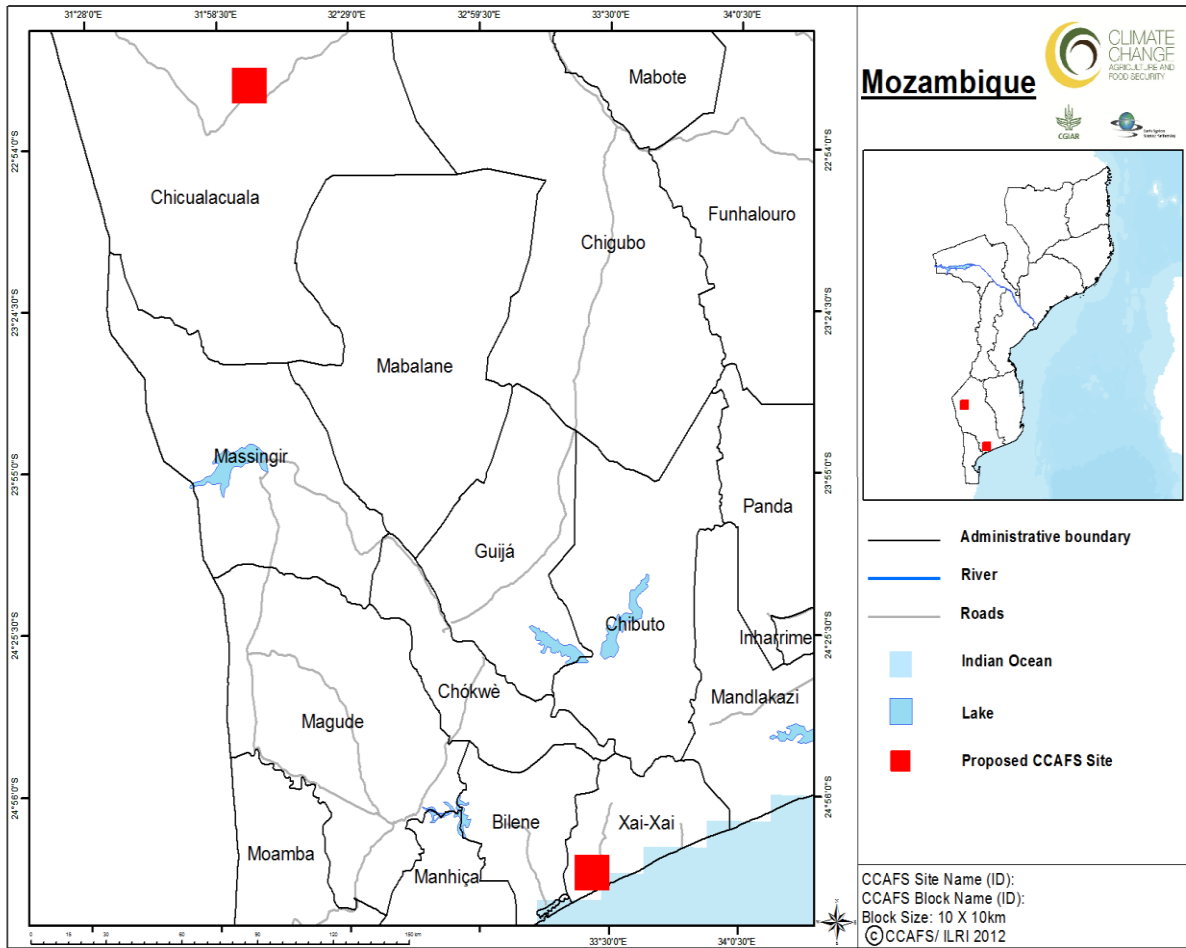
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## Executive Summary

IUCN carried out household baseline survey in two sites in Mozambique in 2012/2013. This report presents the main results of the analysis of the survey carried out in November 2012 in seven villages, with 140 households, in Xai Xai District, a National Agricultural Research Institute (IIAM) priority site, located in Gaza Province, in the Limpopo river basin, Mozambique. The survey was carried out using the standardised CCAFS household baseline tool. Within the Xai Xai district the site a 10 x 10 km block was selected. A complete and up-to-date list of villages within the block was made. A random sample of seven villages was taken from all those villages in each block. A complete list of households within each selected village was generated. 20 households were selected at random from the list within each village. The CCAFS questionnaire was then used on a total sample of 140 respondents.

The results show that the vast majority of surveyed households in Xai Xai produce food crops and rely on livestock production for their livelihoods. A description of a typical household was that 57% are male headed, 47% female headed and 66% have 1 or more children <5 years. The prominent ethnic group is Changani (100%) and the average household size is 5.3. The education level is low with 18% not having received any formal education and for 62% Primary school is the highest level of Education with 20% of households with a family member in secondary education. Households are poor with 66% having improved roofing material and only 36% having access to stored water and electricity. The majority of households (64%) have access to between 1-5 hectares of land. An unexpected finding was that 95% stated that they did not belong to a Community group or Association.

Household livelihood resources from on-farm sources, nearly every family (99%) produced staple food crops and 14% sell the staple food crop for cash. 99% produced other food crops but only 6% sell them. Fruit is also produced on farm (96% owning fruit trees) and 8% sell fruit. Small livestock is very important with 65% producing and 16% selling small livestock, the most important marketable commodity. 12% produce large livestock and only 4% sell them. In terms of off-Farm resources fuel wood is the most important with 100% of households produce it but no one sells it. Fish is produced by 6% of households but is rarely sold, which is surprising for this area. 11% produce honey mainly for own consumption as only 3% sell it. Most of the crop production is consumed by the family members themselves, as few households sell their agricultural produce. Households that do sell produce usually sell small livestock, fruit and food crops. On-farm consumption is supplemented with off-farm produce as well.

Women carry out most of the work both on and off farm, but some work is specifically for men as well as being shared between men and women. 15% is carried out by family as a whole. 71% of households receive remittances, 56% are employed on other peoples farms, 42% can have access to informal loans or credit which is quite high for Mozambique, 39% have paid non-farm employment and 34% have other businesses. A quarter of households have a family member working for the government. Nearly all households experience a food shortage between September and January.

Generally, maize, rice and groundnuts were cited as the three most important crops in this area. However inputs are scarce and fertilizer not commonly used. Only one per cent of households are food secure throughout the year and 81% experience difficulties in feeding their families from any source for one to two months each year. The main inputs available, affordable and used are improved seeds (46% households use them), 9% use pesticides and 8% veterinary medicines. 44% of households hire farm labour, 15% of households hire animal traction and 31% irrigates farmland.

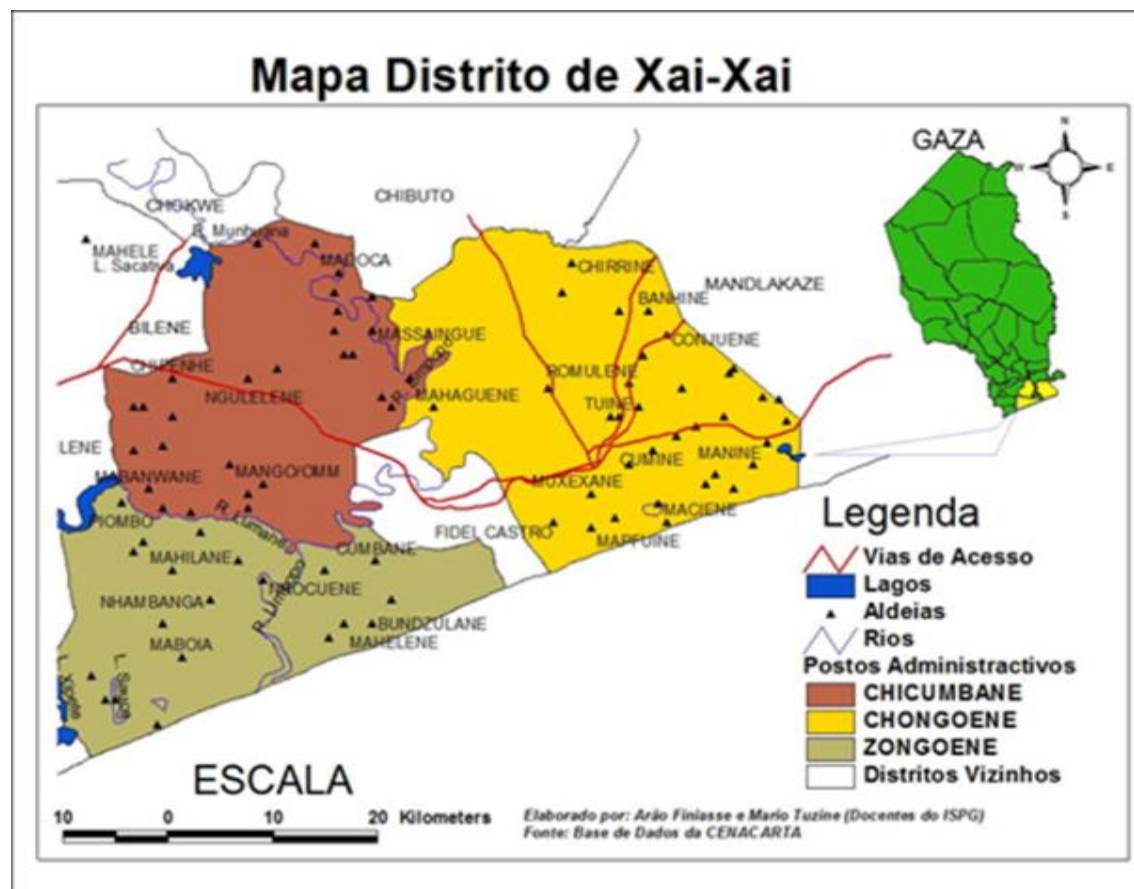
Households have been adapting and making changes in their farming practices over the last ten years, with the majority of households stating they had made changes to at least three of their crops, however, cropping patterns remain similar to those of 10 years ago except for an increase in cassava production. The main changes have been varietal changes, for example, 65% have introduced new varieties of higher yielding, maize planted and pre-treated onions. 94% of households have introduced intercropping and 70% are planting much later than previously. The reasons given for these changes were mainly climatical, i.e. 35% because of more erratic rainfall, 26% because of more frequent draughts and 18% because of less overall rainfall. Chicken, beef, ducks and goats are the most cited livestock, but few have made livestock-related management changes except to increase diversification and change more disease resistant breeds. Resistance to disease and market-related reasons are behind these changes. Looking at the adaptability index, the many households (over 50%) make between two and ten changes and 11 or more changes to their farming systems making these households in Xai Xai high adapters.

Radio, Friends, relatives and neighbours are the most common sources of weather and climate-related information. Nearly twice as many females as males receive weather-related information. Less than half of households that received weather information included some advice on how to use the information for making farm decisions. Most information received was related to either the start of the rainy season or extreme weather events. Very few changes to the farm management decisions/changes were made based on this information.

87% of respondents reported that their household had been impacted by a climate related crisis within the last five years. Among them, 25% said that they had received some type of assistance, with the majority reporting that that assistance came from family/friends (93%), government agencies (6%).



## 1.0 Background and Description of Survey Area.



**Figure 2 Study area**

The District of Xai Xai is located in the South of the Province of Gaza. It has an area of 1,745 Km<sup>2</sup>, representing about 2.73% of the total area of the Province. The length of the coastline is 67 kilometers. The capital of the District (and Province) is the City of Xai Xai, with about 150,000 inhabitants. The terrestrial area of the Xai Xai district contains three basic geographic entities: the belt of coastal dunes, Limpopo River valley and the area of inland dunes. The near shore sea and the belt of coastal dunes are fragile environments which natural resources are constantly exploited by the local population and visitors. Agriculture is the main activity in the area of inland dunes presently has a limited impact upon coastal resources.

## 2.0 The Survey

### 2.1 Objective of the Survey

**Goal:** Enhanced livelihood resilience and adaptive capacity to climate change risks in food insecure areas in Southern Mozambique

**Purpose:** Enhanced role of agricultural and ecosystems services and goods in managing climate related risks to improve livelihood resilience and adaptive capacity in Southern Mozambique.

The International Union for the Conservation of Nature (IUCN) was subcontracted by the National Institute for Agricultural Research (IIAM) to implement a Baseline survey for the Climate Change for Agriculture and Food Security Project (CCAFS) funded project entitled *Managing climate related risks to improve livelihood resilience and adaptive capacity in agricultural ecosystems in Southern Mozambique*.

**Output 1.** To investigate local knowledge regarding climate change, its effects on the community livelihoods, the changes they introduce in the system to manage these climate changes.

## 2.2. Scope of the Survey

This was done by replicating the CCAFS Baseline Survey (<http://ccafs.cgiar.org/resources/baseline-surveys>). The Baseline Survey sought to identify the risks and opportunities posed by climate change to the agricultural system and the effective strategies farmers are already using to enhance their adaptive capacity. This part of the survey was conducted at the household level. Village and organizational level surveys will be conducted during the next phase of the research. The survey is an important tool to understand the starting point over which the project research outputs will be better defined, monitored and evaluated.

## 2.3. Sampling Procedure

### **Sampling scheme for selecting blocks, villages and households for the baseline survey**

The sampling requires 3 layers in a hierarchy: 10 x 10 km block (one per site/district), villages within a block (7) and households within each village (20). This scheme does not refer explicitly to administrative hierarchies.

### **Steps:**

1. The sites are equivalent to a district, in this survey there are two sites (i) Chicualacuala district and (ii) Xai Xai district, both in Gaza Province. This report will only cover results from Xai Xai
2. Within that larger site a 10 x 10 km block is selected for the baseline survey.
3. Locations of sites/blocks are based on the criteria described in the site criteria Table 1. below.

**Table 1. Site selection criteria**

Criterion
Locations representing key biophysical and agro-ecological gradients of the respective regions
Research locations that represent the key socio-economic and (where relevant) demographic gradients for the region, including extent of urbanization and gendered participation in different agricultural production systems
Research sites that lie along gradients of anticipated temperature and precipitation

change
Research sites that lie along gradients of current and anticipated land use pressure
Research sites that represent different institutional (e.g. land tenure) arrangements. Similarly, gradients of significant difference in political and governance history
Sites that have significant but contrasting climate-related problems and opportunities for intervention
High potential sites, i.e. where impact is likely to be achieved: sites that build on ongoing CGIAR and national research infrastructure and research sites, and thus have good existing data on historical weather records; characterization of the natural resource base; detailed, longitudinal data on agricultural production; detailed, longitudinal socio-economic and demographic data at the household and village settlement/district level; data on the food system; and data on historical events and shocks experienced in relation to food security in the site
Governance and institutional capacity that favor the likelihood of scaling up and generating transferable results
A network of regional partners that will facilitate scaling up
Sites that have mitigation/carbon sequestration potential
Sites that are safe to work in, i.e. have good security for research teams
Research sites that are physically accessible and have the minimum logistical comforts for conducting research
Marginal sites with high vulnerability where impact will be difficult to achieve but where the need for innovative solutions to poverty and climate change vulnerability may be greatest

4. One block per site was selected.
5. In this survey the criteria for selection of a site were met by an area of 10 x 10 km block, however, larger blocks can be used e.g. 30 x 30 km block if criteria cannot be met within 10x10km, i.e. low population density or dispersed populations.

#### **Block coordinates for the Xai Xai Site are:**

- Point 1. E 549680 and S 7220900
- Point 2. E 539680 and S 7220900
- Point 3. E 539680 and S 7210900
- Point 4. E 549680 and S 7210900

#### Villages

1. The definition of a 'village' was that of an entity that has some level of local administration organization. The key criteria are that: (i) People within a village are a 'community' in the sense that there is a level of interaction and dependence among them; (ii) It is possible to define who is/is not part of the village; (iii) It is possible to communicate with the village (e.g. through a headman or similar to call a village meeting).
2. A complete and up-to-date list of villages within each selected block was then made.
3. A random sample of seven villages was taken from all those villages in each block.

## Households

1. This survey was based on interviews of one or more individuals (ideally the household head and spouse) within the household who were able to answer questions about their household. Enumerators were instructed to try to confirm responses with appropriate household members if and when possible. All of the questions refer to people who are regularly resident in the household. A household was defined as follows:  
*'A household is composed of a group of people living in the same dwelling space who eat meals together and have at least one common plot together or one food/income-generating activity together (e.g. herding, business, fishing) and acknowledge the authority of a man or woman who is the head of household' (Beaman and Dillon, IFPRI, 2010).*
2. A complete list of households within each selected village was generated.
3. 20 households were selected at random from the list within each village.

Drawing a list of households in the village: A traditional survey team approach was used to develop the household list visiting and numbering every household in the village. A random number table was then used to select the 20 households as per the manual.

During the survey village guides were used to identify households, i.e. someone from the community who knows it well and can accompany the team during the household listing and numbering.

### **2.3. Survey Instrument and Survey Topics**

To implement the Baseline Research Survey at each of two selected site (using the already tested CCAFS methodology) to better understand farmers' perceptions on climate change vulnerability, if and how farmers are changing agricultural practices in response to climate change. This baseline research will provide quantitative and qualitative information to guide the identification of alternative technological packages deemed suitable for the prevailing farming systems.

In this report the baseline survey has been conducted 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. The objective was to capture some of the diversity in the landscape, across communities and households. The data collected aims for sufficient precision in these indicators to capture changes that have occurred over time. The survey also included information on household size, type and education levels; household assets; sources of livelihood; natural resources access and management; adaptation strategies relating to crops, livestock, aquaculture, agro-forestry, and land management; food security and risk; information and knowledge; and social networks. Please see attached questionnaire Annex 1 – English and Portuguese.

### **2.4. Survey Implementation**

The survey took place 4/11/2012 – 25/11/2012. Three enumerators and a supervisor at each site. Each enumerator completed three surveys in one day (sometimes four). Therefore taking two to three days per village & 15-16 days in total for each site. In first two weeks the enumerators collected data for six days and then had a break on Sunday.

## 2.5. Selection and Training of Survey Interviewers

**Team Selection:** The supervisors were preselected from lecturers in the polytechnic – Tuzine to lead the Xai Xai team and Arao to lead the Xai Xai team. Six of the best enumerators from twelve agriculture students who participated in the training were selected and were contacted for the survey.

## 2.6. Data Entry, Analysis, and Report Compilation:

CSPRO training took place for the data entry team in Maputo on 20/10/2012, two data processors and one supervisor. Data entry to take place consecutively with survey on one week lag and data was entered in a double data entry process (i.e. both processors will enter every questionnaire). All data was entered and internally verified within two weeks of the final data collection.

**Data Analysis:** Upon completion and verification of data the data was sent to the Statistical Services Centre, University of Reading for further checks on the data and production of generic statistical analysis.

## 3.0 Household Description

### **Gender of Survey Respondents, and Gender and Civil Status of Heads of Households**

A total of 140 respondents were interviewed during the survey. Among them thirty nine (39) were male (28% of the sample) and one hundred and one (101) were female (71% of the sample).

Fifty six percent (57%) of respondents reported that their household is headed by a male. Male heads of household were typically reported to reside with their wife (94%) and only a small percentage (5%) were reported to be divorced, single, or widowed.

Forty two percent (42%) of respondents reported their household is headed by a female. In contrast to male heads of household, female heads of household were most commonly reported to be divorced, single, or widowed (85%). Among the remaining fifteen percent (15%) of female headed households, the male was reported to part of the family, but normally absent from the home.

**Table 3.1. Types of households included in the survey, by percentage of households**

Characteristics of head of households	Male Headed		Female Headed	
	Number	Percent	Number	Percent
Type of household	80	57	60	42
Civil status of head of household				
Husband living with wife	75	94 <sup>a</sup>		
Female married, but husband living outside household			9	15 <sup>b</sup>
Divorced, separated, or Widowed	5	6 <sup>a</sup>	51	85 <sup>b</sup>

<sup>a</sup>This percentage is based on a sample of 80 male headed households. Percentages not equal to 100 because of rounding error.

<sup>b</sup>This percentage is based on a sample of 60 female headed households

**Household Size and Proportion of Residents of Working and Non-working Age**

Among all households, the mean household size was 5.3 individuals (range 1 to 17). There is 95% statistical confidence that the mean number of household members lies between 4.8 and 5.8, and the median household size is 5 individuals, meaning that half of households have more than 5 residents and half of households have fewer than 5.

Two-thirds of households (66%) reported that their household contained one or more children under the age of five years, and one-third (36%) of households were reported to contain one or more residents over the age of 60 years.

Most survey households could be characterized as having a productive ratio of working age to non-working age individuals, with the majority of households (68%) reporting that sixty percent or more of the residents were of working age. Few households (11%) reported that most of the residents (60% or more) were of non-working age (Table 3.2).

**Table 3.2. Proportion of working age and non-working age household residents, by percentage of households per category**

Proportion of household residents of working or non-working age	Number of households	Percentage of households
<b>Working age residents</b>		
More than 60% of residents are of working age	95	68
Fewer than 60% of residents are of working age	45	32
<b>Non-working age residents</b>		
More than 60% of residents are of non-working age	15	11
Fewer than 60% of residents are of non-working age	125	89

**Education Levels**

Eighteen percent (18%) of households reported that no resident has any formal education, while about two-thirds (62%) that primary school was the highest level of education attained by a member of their households. Twenty percent (20%) of households reported that a member had completed secondary school and no household reported post-secondary school credentials (Table 3.3).

**Table 3.3 Highest level of level of education attained by a household member, by percentage of households**

Highest level of education of any resident household member	Number of households	Percentage of households
No formal education	25	18
Primary	87	62
Secondary	28	20
Post-secondary	0	0
Total	140	100

### **House Construction Materials and Households Utilities**

Two-thirds of respondents reported that their houses have an improved roof (66%) and that they are constructed from concrete or brick (64%). Forty four percent (reported that they have separate housing for their animals and thirty six percent presorted that their households has a water storage tank of at least 500 liters.

Few households reported having an improved stove (6%), running water at their home (5%), or electricity from the grid (4%). Only two households (1%) reported to have a borehole well.

**Table 3.4. Improved housing and access to utilities, by percentage of households**

Types of housing components and utilities	Number of households	Percentage of households
<b>Improved housing</b>		
Improved roofing (e.g. tin, tile)	93	66
Improved housing (e.g. concrete, brick)	90	64
Separate housing for farm animals	62	44
Improved storage facility for crops	30	21
<b>Utilities</b>		
Household water storage tank (>500 liters)	51	36
Improved stove	8	6
Running water in dwelling	7	5
Electricity from grid	5	4
Well/borehole	2	1

### **Household Assets**

Three-fourths (78%) of respondents reported that their household has one or more types of information assets and the most commonly owned were cell phone (69%), radio (49%), and television (27%). Twenty one percent (21%) reported owning energy assets and the most common types were solar panel (15%) and battery (10%). Fewer respondents reported that their households owned transportation assets (16%), or luxury assets (6%), although among those, bicycle (12%) was the most frequently mentioned.

**Table 3.5. Types of assets owned by households, by percentage of households**

Type of asset	Number of households	Percentage of households
<b>Information Assets</b>		
Cell phone	97	69
Radio	69	49
Television	38	27
Computer	1	1
Internet access	0	0
<b>Transportation Assets</b>		
Bicycle	17	12
Motorcycle	6	4
Car or truck	5	4

Energy Assets	30	21
Solar panel	21	15
Battery (car battery)	15	10
Motor (electric or diesel)	9	7
Production Assets	1*	1*
Fishing nets	5	4
Boat	4	3
Tractor	1	1
Animal traction plough	1	1
Luxury Assets	9	6
Bank account	4	3
Refrigerator	2	1
Electric fan	2	1

\*This is obviously in error, but was correctly taken from data analysis file provided

An asset index was developed to categorize households according to their ownership [of various types of assets. Among all households, nineteen percent (19%) were found to have none of the queried assets, seventy percent (70%) of households reported having 1-3 of the assets, and eleven percent (11%) reported having four or more of the different types of assets (Table 3.6).

**Table 3.6 Asset index by percentage of households per index category**

Number of queried assets	Number of households	Percentage of households
None (basic level)	26	19
1-3 (intermediate level)	97	70
4 or more	15	11
System missing	2	
Total	140	100

#### **Membership in Associations or other Community Based Organizations**

Ninety five percent (95%) of respondents reported that no member of their household belonged to any type of Association or Community Based Organization (Table 3.7). One percent (1%) of households reported membership in groups related to, tree nursery/tree planting, forest product collection, crop introduction/substitution, or water catchment/management.

**Table 3.7 Association or community-based organization membership, by percentage of households**

Types of Associations of Community-Based Organizations	Number of households	Percentage of households
Tree nursery/tree planting	2	1
Forest product collection group	2	1
Crop introduction/substitution group	2	1
Water catchment/management	1	1
Other group not mentioned above?	1	1



Soil improvement related	0	0
Crop improvement related	0	0
Irrigation	0	0
Savings/credit related	0	0
Agricultural product marketing	0	0
Agricultural productivity enhancement related	0	0
Seed production	0	0
Vegetable production	0	0
No group membership	133	95

### **Discussion**

The results show that the vast majority of surveyed households in Xai Xai produce food crops and rely on livestock production for their livelihoods. A description of a typical household was that 57% are male headed, 47% female headed and 66% have 1 or more children <5 years. The prominent ethnic group is Changani (100%) and the average household size is 5.3. The education level is low with 18% not having received any formal education and for 62% Primary school is the highest level of Education with 20% of households with a family member in secondary education. Households are poor with 66% having improved roofing material and only 36% having access to stored water and electricity. The majority of households (64%) have access to between 1-5 hectares of land. An unexpected finding was that 95% stated that they did not belong to a Community group or Association.

## **4.0 Household Livelihood Resources: Access to, Consumption, and Sale of On-Farm and Off-Farm products**

### **On-Farm Livelihood Resources**

Over half of respondents reported that on their farms, their households produce and consume food crops, processed food crops, fruits, fuel wood, vegetables, and small livestock. With the exception of small livestock (16%) and raw food crops (14%) few on-farm products were reported to be sold.

**Table 4.1 Number and percentage of households producing, consuming and selling various products produced on their own farms (on-farm)**

Types of on-farm products	Producing		Consuming		Selling	
	Number	Percent	Number	Percent	Number	Percent
Food crops (raw)	138	99	138	99	19	14
Food crops (processed)	137	99	137	99	9	6
Fruits	134	96	129	93	11	8
Fuel wood	125	90	124	89	0	0
Vegetables	119	86	116	84	10	7
Small livestock	90	65	85	61	23	16
Other cash crops	30	22	30	22	11	8
Manure/compost	18	13	17	12	0	0
Large livestock	16	12	14	10	5	4
Honey	5	4	5	4	1	1

Charcoal	2	1	1	1	1	1
Other	2	1	2	1	0	0
Fodder	1	1	1	1	0	0
Livestock products	1	1	1	1	0	0
Timber	0	0	0	0	0	0
Fish	0	0	0	0	0	0

### **Off-Farm Livelihood Sources**

Over half of respondents reported that their households produced and sold fuel wood, fruits, and food crops collected off-farm. Less than five percent of households reported to have sold any type of off-farm product.

**Table 4.2 Number and percentage of households producing, consuming and selling various products produced outside their own farms (off-farm)**

Types of off-farm products	Producing		Consuming		Selling	
	Number	Percent	Number	Percent	Number	Percent
Fuel wood	140	100	128	91	0	0
Fruits	110	79	108	77	6	4
Food crops	81	58	81	58	1	1
Manure/compost	24	17	22	16	0	0
Honey	16	11	16	11	4	3
Fish	8	6	8	6	4	3
Charcoal	6	4	5	4	2	1
Fodder	3	2	3	2	0	0

### **On-farm and Off-Farm Production Responsibilities Falling Mainly to Women and Children**

Respondents reported that in their households, women are primarily responsible for the production of processed food crops (79%), fuel wood (73%), raw food crops (70%), vegetables (60%), and fruit (59%). Among off-farm products, women are primarily responsible for the collection of fuel wood (79%) and fruits (52%). Seven percent (7%) of households reported that women were not primarily responsible for the production of any type of on-farm produce, and seventeen percent (17%) reported that women were not primarily responsible for the production/collection of any type of off-farm product.

Eighty six percent (86%) of households reported that children were not primarily responsible for the production of any type of on-farm products and ninety seven percent (97%) reported that children were not primarily responsible for the production/collection of any type of off-farm products. In eleven percent (11%) of households, children were reported to be primarily responsible for the production of small livestock.

**Table 4.3. Percentage of women and children that were reported to be primarily responsible for the production of various on-farm and off-farm products**

Types of products	On-farm products				Off-farm products			
	Women		Children		Women		Children	
	No.	%	No.	%	No.	%	No.	%
Food crop (processed)	111	79	2	1	0	0	0	0

Fuel wood	104	73	0	0	110	79	2	1
Food crop (raw)	98	70	2	1	73	52	2	1
Vegetables	84	60	3	1	Not applicable			
Fruit	82	59	3	2	57	41	1	1
Small livestock	45	32	15	11	Not applicable			
Other cash crop	21	15	0	0	0	0	0	0
Manure/compost	11	8	2	1	13	9	1	1
Not responsible for any product	10	7	120	86	24	17	136	97
Other product	2	1	0	0				
Large livestock	1	1	6	4	Not applicable			
Livestock products	1	1	0	0				
Charcoal	1	1	0	0	2	1	0	0
Honey	1	1	0	0	1	1	1	1
Fish	0	0	0	0	2	1	0	0
Fodder	0	0	1	1	0	0	2	1

### **Livelihood Diversification Indices**

A production index was created to classify households as having low, medium, or high production diversification based on the number of products they reported to have produced on-farm. Using this index, ninety two percent (92%) of households would be classified as having an intermediate level of production diversification (5-8 products), seven percent (7%) would be classified as low production diversification (1-4 products), and one percent would be classified as having high production diversification (9 or more products) (Table 4.4).

A similar index was developed to characterize household levels of commercialization diversification. Among all households surveyed, sixty nine percent (69%) reported no commercialization of on-farm products, twenty two percent would be classified as having a low commercialization diversification (1-2 products sold), nine percent (9%) of households would be classified as having an intermediately level of commercialization diversification, and one percent (1%) would be classified as highly commercially diversified.

**Table 4.4 Production and commercialization diversification indices**

Production and Commercialization Indices	Number of households	Percentage of households
<b>Production Diversification</b>		
1-4 products (low production diversification)	10	7
5-8 products (intermediate production diversification)	128	92
9 or more products (high production diversification)	1	1
System missing	1	
Total	140	100
<b>Selling/Commercialization Diversification</b>		
No products sold (no commercialization)	96	69
1-2 products sold (low commercialization)	31	22
3-5 products sold (intermediate commercialization)	12	9
6 or more products sold (high commercialization)	1	1
Total	140	101*

\* Not equal to 100 because of rounding error.

### **Off-farm sources of cash income**

Ninety nine percent (99%) of households reported to have a non-farm source of cash income and, on average, reported receiving cash from 2.5 sources (range 0 to 6). There is 95% statistical confidence that the true mean number of non-farm income sources lies between 2.3 and 2.7 and the median number of income sources is 2, meaning that half of households receive incomes from more than 2 sources and half of households receive income from fewer than 2 sources.

Twenty five percent (24%) of respondents reported that during the last 12 months their household began receiving a cash income from at least one new source. Twenty one percent (21%) of households reported that they were no longer receiving cash from at least one source that they had received from a year ago. Fifty nine percent (59%) reported that there was no change in their income sources from one year ago.

**Table 4.5. Off-farm cash income sources by percentage of households**

Source of Cash Income	Number of households	Percentage of households
Remittances/gifts	100	71
Employment on someone else's farm	78	56
Informal loan or credit	59	42
Other paid non-farm employment	55	39
Business	48	34
Payments from government or other projects/programs	5	4
Loan or credit from a formal institution	4	3
Renting out farm machinery	3	2
No off-farm cash sources	1	1
Renting out your own land	0	
Payments for environmental services	0	

### **Discussion**

Household livelihood resources from on-farm sources, nearly every family (99%) produced staple food crops and 14% sell the staple food crop for cash. 99% produced other food crops but only 6% sell them. Fruit is also produced on farm (96% owning fruit trees) and 8% sell fruit. Small livestock is very important with 65% producing and 16% selling small livestock, the most important marketable commodity. 12% produce large livestock and only 4% sell them. In terms of off-Farm resources fuel wood is the most important with 100% of households produce it but no one sells it. Fish is produced by 6% of households but is rarely sold, which is surprising for this area. 11% produce honey mainly for own consumption as only 3% sell it. Most of the crop production is consumed by the family members themselves, as few households sell their agricultural produce. Households that do sell produce usually sell small livestock, fruit and food crops. On-farm consumption is supplemented with off-farm produce as well.

## 5.0 Food Security

### **Reported Periods of Food Insecurity During the Last 12 months**

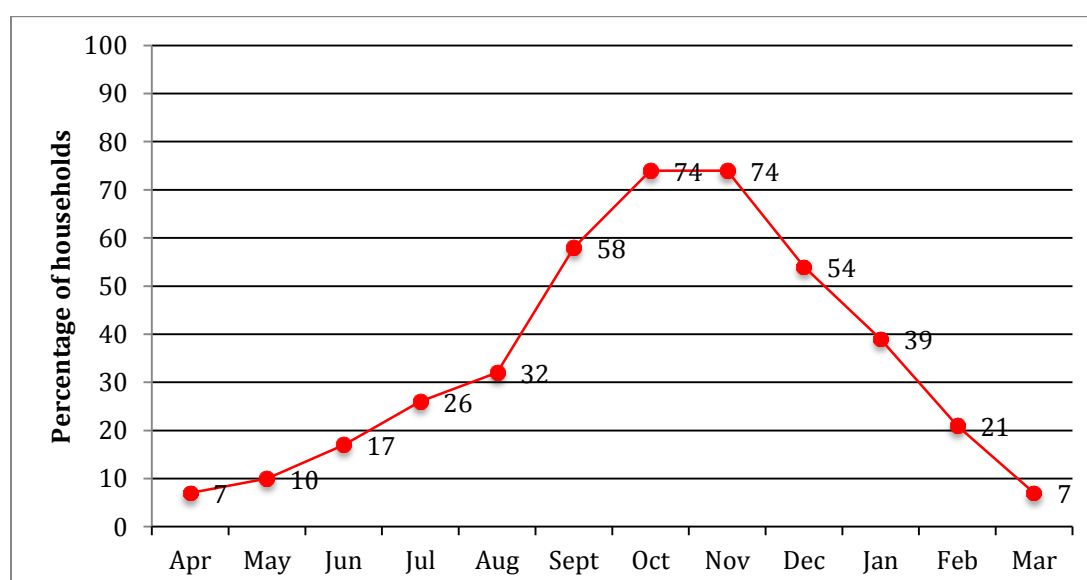
During the interviews, respondents were asked to recall the months when their household had experienced a period of food shortages during the past year. They were also asked to recall the primary source of household food (either on-farm “own production” or off-farm) during each month of the previous year.

On average, households reported to have experienced food shortages during 4.2 months of the previous year (range 0 to 9 months). There is 95% statistical confidence that the mean number of months of food insecurity lies between 3.9 and 4.5 months, and the median number of hungry months is 4, meaning that half of households reported to have experienced food shortages for more than 4 months and half of households reported to have experienced food shortages for less than 4 months.

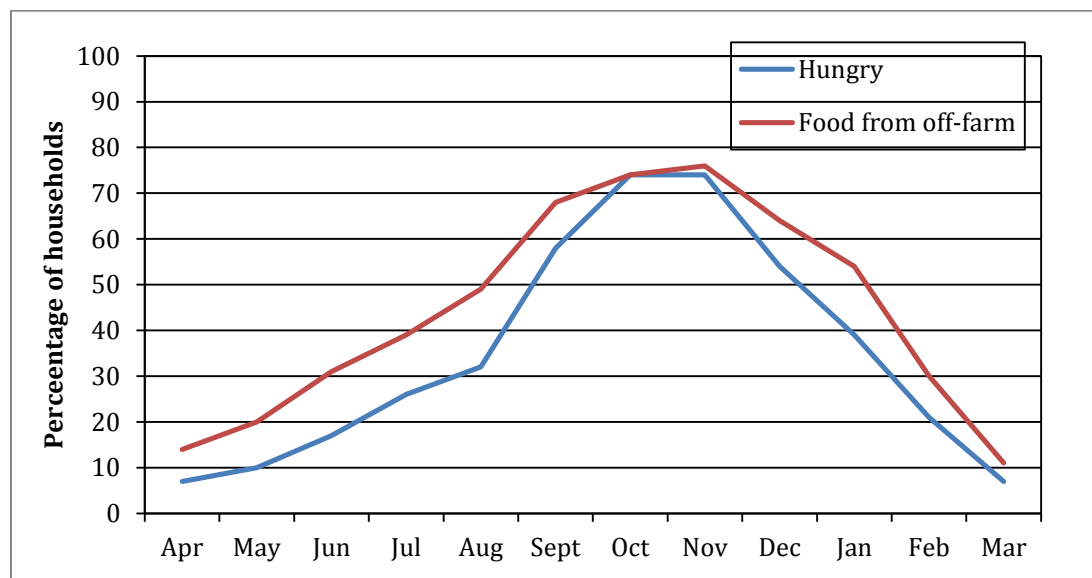
Seven percent (7%) of respondents reported that their households experienced no periods of food shortage during the previous year and no (0%) respondents reported that their household experienced a food shortage during every month. Approximately one-in-three households reported experiencing periods of hunger between August and January, and fifty percent (50%) or more reported experiencing periods of hunger between September and December (Figure 5.1). Based on responses provided by respondents, during the 12 months immediately prior to the survey, the hunger season had peaked in October (74%) and November (74%) when three fourths of households reported to have experienced food shortages.

The months with the highest percentages of food insecure households coincide with the months when the highest percentage of households were also relying primarily on off-farm food sources (Figure 5.2), indicating an inability to provide adequate household food supplies when relying primarily on off-farm food resources.

**Figure 5.1. Percentage of households reporting a food shortage during the previous year, by month**



**Figure 5.2. Percentages of households reporting food shortage and reporting to procure most of their food from off-farm sources, by month**



**Discussion**

Women carry out most of the work both on and off farm, but some work is specifically for men as well as being shared between men and women. 15% is carried out by family as a whole. 71% of households receive remittances, 56% are employed on other peoples farms, 42% can have access to informal loans or credit which is quite high for Mozambique, 39% have paid non-farm employment and 34% have other businesses. A quarter of households have a family member working for the government. Nearly all households experience a food shortage between September and January.

Generally, maize, rice and groundnuts were cited as the three most important crops in this area. However inputs are scarce and fertilizer not commonly used. Only one per cent of households are food secure throughout the year and 81% experience difficulties in feeding their families from any source for one to two months each year. The main inputs available, affordable and used are improved seeds (46% households use them), 9% use pesticides and 8% veterinary medicines. 44% of households hire farm labour, 15%of households hire animal traction and 31% irrigates farmland.

**6.0 Agricultural Practices**

**Land Use**

Respondents reported that their households currently cultivate 2.1 hectares of land, on average, with 95% statistical confidence that the true mean is between 1.9 and 2.3 hectares. The range was 0 to 6 hectares, and the median was 2.0, meaning that half of the households reported cultivating more than 2 hectares and half of the households reported cultivating less than 2 hectares.

In corollary to that, when respondents were asked how much land their household owns, the mean area reported was 2.4 hectares (95% CI [2.1, 2.6]). The range was 2.1 to 2.6 hectares, and the median, again, was 2.0 hectares.

This would indicate that on average, households are cultivating eighty eight (88%) of the land they control. When asked to estimate the area of their land that was currently degraded, the mean estimate was 0.1 hectare.

The majority of households (71%) reported to currently use 1-5 hectares of land for crop production (Table 6.1). About one fourth of households (26%) reported that they farm areas of less than one hectare, and three percent (3%) of households reported that they currently farm more than five hectares.

Almost all households (93%) reported that they did not currently have access to land to expand their crop production area (Table 6.2). And few, only four percent (4%) reported to use communal land for any agricultural purpose (Table 6.3).

**Table 6.1 Areas of potentially land available and areas currently used for cropping, by percentage of households**

Farmland status	Areas of land controlled by household		
	<1 hectare	1-5 hectares	>5 hectares
Total land accessed by household	26	71	3
Land area available for cropping	33	64	3
Land area currently used for cropping	30	69	1

**Table 6.2. Potential land for expanding crop production activities, but number and percentage of households**

	Number of households	Percentage of households
No room to expand	130	93
Less than one hectare	4	3
More than one hectare	6	4
Total	140	100

**Table 6.3. Use of communal land by number and percentage of households**

	Number of households	Percentage of households
Use communal land	5	4
For growing crops	2	1
For grazing livestock	4	3
Under tree cover	1	1
Do not use communal land	135	96

#### ***Agricultural Inputs Purchased During the Last Year and Use of Agricultural Credit***

Almost half (46%) of respondents reported that their household purchased seeds during the previous year and nine percent (9%) reported to have purchased veterinary medicines. Fifty

one percent (51%) of households reported to have purchased no agricultural inputs during the previous year. Only one household reported to have received credit for agricultural activities.

**Table 6.4 Agricultural Inputs Purchased, by percentage of households**

Type of Input Purchased	Number of households	Percentage of households
Seeds	64	46
Pesticides	13	9
Veterinary medicine	5	4
Fertilizers	5	4
Received credit for agricultural activities	1	1
None of the above	74	51

#### ***Use of Fertilizer***

Four percent (4%) of households reported to have purchased chemical fertilizer during the last 12 months.

#### ***Tree Planting***

Thirty nine percent (39%) of households reported to have planted trees during the last 12 months. Thirty two percent (32%) reported to have planted 1-10 trees and seven percent (7%) reported to have planted 11-50 trees.

**Table 6.5 Number of trees planted during the past year, by number and percentage of households**

	Number of households	Percentage of households
No trees planted	85	61
1-10 trees planted	45	32
11-50 trees planted	10	7
TOTAL	140	100

#### ***Access to Hired Farm Equipment and Labour***

Almost half of households (44%) reported to have hired farm labour during the previous 12 month and fifteen percent (15%) reported to have hired and animal drawn plough (Table 6.6). Fifty one percent (51%) of households did not hire any farm equipment or labour.

**Table 6.6. Percentage of households reporting to hire farm equipment or labour**

Type of farm input hired	Number of households	Percentage of households
Farm labour	62	44
Animal drawn plough	21	15
Tractor	5	4
Do not hire farm equipment or labour	72	51



### **Water for Agriculture**

Almost one-in-three respondents (31%) reported that their household used irrigation during the previous year (Table 6.7).

**Table 6.7 Water sources for agriculture on-farm**

On-farm agriculture water sources	Number of households	Percentage of households
Irrigation	44	31
Tanks for water harvesting	1	1
Dams or water holes	1	1
Boreholes	1	1
Water pumps	1	1
None of the above	94	67

### **Information Received About Pest or Disease Outbreak and Use of the Information in Making Farm Decisions**

Eight percent of respondents reported that their household received information about pest or disease outbreak during the previous 12 months. The reported that the information was received from radio, government extension or veterinary offices, friends/relatives /neighbors, and local groups/gatherings/meetings. This information was most frequently reported to have been received by women or both men and women. Among households that reported to have received information, five (5) reported that it included advice on how to use the information, and one (1) household reported that they were able to use the advice.

### **Discussion**

Generally, maize, rice and groundnuts were cited as the three most important crops in this area. However inputs are scarce and fertilizer not commonly used. Only one per cent of households are food secure throughout the year and 81% experience difficulties in feeding their families from any source for one to two months each year. The main inputs available, affordable and used are improved seeds (46% households use them), 9% use pesticides and 8% veterinary medicines. 44% of households hire farm labour, 15%of households hire animal traction and 31% irrigates farmland.

## **7.0 Changes Made to the Agricultural System Over the Past 10 Years and Reasons Given for Change<sup>1</sup>**

### **Changes Made to Crops Over the Past 10 Years**

When asked to name the crop that is most important for their household livelihood, two thirds (69%) reported maize, followed by rice (13%), groundnuts (5%) (Table 7.1). Less than five percent of households reported other crops to be of the major importance. This was

<sup>1</sup>During the survey respondents could discuss changes made for up to five different types of crops and five different animals. For simplicity, this analysis considers only the types of changes reported to have been made to the first crop or animal they mentioned. This allows the report to capture the changes of main importance without becoming mired in repetitive details included about crops or animals of lesser importance to the household. The same strategy is employed when reporting the reasons given for having made those changes.

not greatly different from the crops reported to have been the most important 10 years ago, although maize (+7%) and rice (+4%) had slightly increased in importance and cassava (-7%) had slightly decreased in importance among households

**Table 7.1 Crops reported to be the most important to household's livelihood today and 10 years ago, by percentage of households**

Type of crop	Currently most important		Most important 10 Years Ago	
	Number	Percent	Number	Percent
Maize	96	69	87	62
Rice	18	13	12	9
Groundnuts	13	9	14	10
Cassava	6	4	15	11
Sweet potato	3	2	4	3
Leafy Vegetables	2	1	1	1
Cowpeas	1	1	5	4
Flax	1	1	0	0
System missing			2	1
Total	140	100	140	101*

\*Not equal to 100 because of rounding error.

Among all households, ninety percent (90%) reported to have changed one of their most important crops during the past 10 years, and ten percent (10%) reported having changed 2 or 3 of their main crops during that period. Half of household reported that climate was the main reason for having made these crop changes.

The most frequently cited crop change made during the past 10 years was to have introduced a new variety (65%, maize most often mentioned), followed by the planting of pre-treated/improved seed (52%, onion), planting better quality variety (35%, maize), planting higher yielding variety (34%, maize), planting longer cycle variety (34%, cassava), planting shorter cycle variety (34%, maize), planting drought tolerant variety (32%, cassava), testing a new variety (30%, maize), stopped using a variety (24%, maize), with other changes having been reported by fewer than 20% of households. Among households that reported having made changes to their crops during the past 10 years, maize, cassava, and onion were most frequently the first crops mentioned when discussing those changes.

**Table 7.2 Crop changes reported to have been made during last 10 years, by percentage of households**

Changes made	Number of Responses	Percentage of households	Crops most often mentioned first
Introduced new variety of crops	91	65	maize
Planting pre-treated/improved seed	73	52	onion
Planting better quality variety	49	35	maize
Planting higher yielding variety	48	34	maize
Planting longer cycle variety	48	34	cassava
Planting shorter cycle variety	47	34	maize

Planting drought tolerant variety	45	32	cassava
Testing a new variety	42	30	maize
Stopped using a variety	34	24	maize
Planting flood tolerant variety	19	14	rice
Planting saline tolerant variety	9	6	rice
Planting pest resistant variety	6	4	gn,mz,pinap,pump,sugcn,mafura
Planting disease tolerant variety	4	3	ban,gn,mz,pineap
Other changes to crop variety	1	1	banana
Planting toxicity tolerant variety	0		

The most frequently reported land management changes made during the past 10 years were introduced intercropping (94%, maize most frequently mentioned), earlier land preparation (82%, maize), later planting (70%, maize), expanded area (54%, maize), started irrigating (54%, onion and rice), started adding manure/compost (45%, onion), earlier planting (32%, maize), introduced ridges or bunds (31%, onions), introduced cover crop (29%, maize), reduced area (24%, maize), and stopped burning (23%, maize), with other land management changes reported to have been made by fewer than 20% of households. Among households that reported having made changes to their land management practices during the past 10 years, maize was most commonly the first mentioned crop when discussing those changes, followed by onions and rice.

**Table 7.3. Land management changes made during the past 10 years, by percentage of households**

Changes made	Number of responses	Percentage of households	Crops most often mentioned first
Introduced intercropping	132	94	maize
Earlier land preparation	115	82	maize
Later planting	98	70	maize
Expanded area	75	54	maize
Started irrigating	75	54	onions, rice
Started adding manure/compost	63	45	onions
Earlier planting	45	32	maize
Introduced ridges or bunds	44	31	onions
Introduced crop cover	41	29	maize
Reduced area	34	24	maize
Stopped burning	32	23	maize
Introduced rotations	19	13	maize
Introduced improved irrigation	17	12	rice
Started using or using more pesticide	17	12	rice
Introduced mulching	9	6	gnuts, LeafyVeg
Stopped irrigating	1	1	groundnuts
Introduced micro-catchments	1	1	onion
Started adding mineral fertilizer	7	5	onions
Started using integrate crop management	6	4	cassava
Introduced improved drainage	3	2	rice

Stopped using manure/compost	3	2	onions
Introduced mechanized farming	3	2	rice
Introduced tidal water control	2	1	rice
Introduced contour plowing	1	1	cowpeas
Introduced terraces	1	1	citrus
Started using integrated pest management	1	1	Leafy Veg
Introduced stone lines	0		
Introduced hedges	0		
Other land change	0		

The most frequently cited reason for having made crop and land management changes during the past 10 years were land is more productive (57%, changes to maize most often mentioned), better yield (48%, maize), more erratic rainfall (35%, maize), land is less productive (34%, groundnuts), more land (31%, maize), more frequent droughts (26%, maize), and less land (23%, groundnuts), with other reasons for making changes being reported by fewer than 20% of households. When discussing the reason for having made changes to their crop and land management practices during the past 10 years, respondents most frequently mentions maize and groundnuts when discussing those changes.

**Table 7.4. Reason given for having made land management and crop change during the past 10 years, by percentage of households**

Reason for change	Number of responses	Percentage of households	Crops most often mentioned first
<b>Markets</b>			
Better yield	67	48	maize
New opportunity to sell	27	19	banana
Better price	4	3	gn,mz,onion,rice
<b>Climate</b>			
More erratic rainfall	49	35	maize
More frequent droughts	36	26	maize
Less overall rainfall	26	18	maize
Later start of rains	9	6	maize
Strong winds	5	4	maize
More overall rainfall	4	3	maize, rice
Higher salinity	3	2	rice
More frequent floods	2	1	rice, sugar cane
Higher tides (sea level has risen)	2	1	rice
Higher temperatures	1	1	groundnut
Earlier start of rains	1	1	maize
More cold spells or foggy days	0		
More frequent cyclones	0		
Lower groundwater table	0		
<b>Land</b>			
Land is more productive	80	57	maize
Land is less productive	48	34	groundnuts

More land	44	31	maize
Less land	32	23	groundnuts
<b>Labour</b>			
Able to hire labour	25	18	rice
Unable to hire labour (too expensive)	5	4	rice
Sufficient labour	3	2	maize
Unable to hire labour (not available)	1	1	sugar cane
Insufficient labour when needed	0		
<b>Pests &amp; Diseases</b>			
More resistant to pests/disease	20	14	maize
New pests/disease have come	6	4	maize
<b>Projects, etc.</b>			
Government/project showed us how	16	11	maize
Other kinds of changes not listed	13	9	onions
Government/project told us to	6	4	maize
Policy change	1	1	pumpkin/squash

### **Changes Made to Livestock Over the Past 10 Years**

Households reported little change in the types of livestock kept now and that kept 10 years ago. Chickens were the most frequently reported both now (45%) and 10 years ago (48%). Six percent (6%) of households reported to while they did raise livestock 10 years ago, they no long do.

**Table 7.5 Animals reported to be the most important to household's livelihood today and 10 years ago, by number and percentage of households**

Type of animal	Currently most important		Most important 10 years ago	
	Number	Percent	Number	Percent
Chickens	63	45	67	48
Beef cattle	12	9	11	8
Ducks	11	8	13	9
Goats	10	7	12	9
Oxen (traditional)	4	3	4	3
Pigs	4	3	6	4
Rabbits	1	1	1	1
No animals	35	25	26	19
<b>Total</b>	<b>140</b>	<b>101*</b>	<b>140</b>	<b>101*</b>

\* Not equal to 100 because of rounding error.

Among all household, twenty five percent (25%) reported that they do not own any type of livestock, twenty six percent (26%) reported to own one type, twenty six percent (26%) reported to own two types, and twenty three percent (23%) reported owning three or more types of animals (Table 7.6).

**Table 7.6. Number of different types of animals owned by households, by percentage of households**

Number of different types of animals owned	Number of households	Percentage of households
No animals owned	35	25
1 type of animal owned	37	26
2 different types of animals owned	36	26
3 different types of animals owned	32	23
Total	140	100

The most frequently reported livestock management changes made during the last 10 years were stopped keeping one or more types of animal (45%, chickens most often mentioned first), new breed introduced (24%, chickens), reduction in herd size (22%, chickens), new farm animal types introduced (21%, goats), with other changes reported by few than 20% of households (Table 7.7). Chicken and goats were the most frequent types of animals that were mentioned first when discussing these changes.

**Table 7.7. Types of livestock management changes made during the past 10 years, by percentage of households**

Changes made	Number of responses	Percentage of households	Animals most often mentioned first
Stopped keeping one or more types of animals	63	45	chickens
New breed introduced	34	24	chickens
Reduction in herd size	31	22	chickens
New farm animal types introduced	29	21	goats
Increase in herd size	24	17	ducks, goats
Stall keeping introduced	20	14	chickens, pigs
New farm animals being tested	14	10	chickens, pigs
Change in herd composition	7	5	chickens, oxen (traditional)
Cut and carry introduced	5	4	pigs
Fencing introduced	4	3	oxen (traditional)
Other changes not listed	2	1	chickens
Fodder storage	1	1	Oxen (traction)
Growing fodder crops	0		
Improved pasture	0		

Forty five percent (45%) of households report that they currently have one type of animal that is different from 10 years ago (Table 7.8). Forty percent (40%) of households report that they raise 2-3 types of animals and that one (1) is different than 10 years ago, and nine percent report raising 2-3 types of animals with 2-3 types being different that 10 years ago. One fourth of households (25%) report that they do not raise animals now nor did they 10 years ago.

**Table 7.8 Percentage of households reporting to have made changes to the types of livestock they own during the past 10 years**

Number of different types of livestock owned	Number of households	Percentage of households
No animals listed currently or 10 years ago	35	25
Only one animal listed and is the same as 10 years ago	30	21
Only one animal is listed and it is different than 10 years ago	7	5
2-3 animals listed and at most 1 is different to 10 years ago	56	40
2-3 animals listed and 2-3 are different than 10 years ago	12	9
Total	140	100

Ninety six percent (96%) of households reported that they have made changes to one or more of their important farm animals during the last 10 years. On average, these households reported having made changes to 1.5 types of animals.

The most frequently cited reasons for making livestock changes were new diseases occurring (26%, chickens), more productive (26%, chickens), more resistant to disease (22%, chickens), and new opportunity to sell (19%, chickens and ducks) (Table 7.9). Chickens were the type of animal most frequently mentioned first when discussing why livestock management changes had been made during the past 10 years.

**Table 7.9. Reasons for having made livestock changes during the past 10 years, by percentage of households**

Reason for making change	Number of responses	Percentage of households	Animals most often mentioned first
New diseases are occurring	37	26	chickens
More productive	36	26	chickens
More resistant to disease	31	22	chickens
New opportunity to sell	26	19	chickens, ducks
Better price	10	7	pigs
Other reasons for changes to livestock	9	6	beef cattle, goats
Able to hire labour	6	4	beef cattle
More frequent droughts	4	3	goats
Government/project told us to	3	2	oxen (traditional)
Government/project showed us how	2	1	oxen (traditional)
Policy change	2	1	oxen (traditional), guinea pig
More frequent floods	1	1	chickens
Higher tides	0		
Frequent cyclones	0		
More salinization	0		
Insufficient labour	0		

### ***Agricultural System Adaptability Index, Reported Input Intensification and Increased Productivity***

An adaptability index was created to categorize households according to the number of changes they have made to their agricultural systems during the past ten years. Among all households, fifty one percent (51%) are categorized as intermediate adaptors because they reported having made 2-10 changes to their livestock management practices during the last 10 years (Table 7.10). Forty nine percent (49%) of households are characterized as high adaptors, having made 11 or more changes, and no households reported to have made 0-1 changes to their livestock management (low adaptors) during the past 10 years.

**Table 7.10 Adaptability/Innovation Index**

Number of changes made in farming practices in last 10 years	Number of households	Percentage of households
0-1 change (low adaptors)	0	0
2-10 changes (intermediate adaptors)	72	51
11 or more changes (high adaptors)	68	49
Total	140	100

### ***Discussion***

Households have been adapting and making changes in their farming practices over the last ten years, with the majority of households stating they had made changes to at least three of their crops, however, cropping patterns remain similar to those of 10 years ago except for an increase in cassava production. The main changes have been varietal changes, for example, 65% have introduced new varieties of higher yielding, maize planted and pre-treated onions. 94% of households have introduced intercropping and 70% are planting much later than previously. The reasons given for these changes were mainly climatical, i.e. 35% because of more erratic rainfall, 26% because of more frequent draughts and 18% because of less overall rainfall. Chicken, beef, ducks and goats are the most cited livestock, but few have made livestock-related management changes except to increase diversification and change more disease resistant breeds. Resistance to disease and market-related reasons are behind these changes. Looking at the adaptability index, the many households (over 50%) make between two and ten changes and 11 or more changes to their farming systems making these households in Xai Xai high adaptors.

## **8.0 Climate and Weather Forecast Information**

### ***Access to Weather Forecast Information***

Fifty nine (59%) of respondents report that their households had received some type of weather or climate related information during the past year (Table 8.1). Thirty nine percent (39%) reported that they had received information about the start of the rainy season, thirty nine percent (39%) reported that they had received information forecasting an extreme weather event, thirteen percent (13%) reported that they received short term weather forecasts covering the next 2-3 days, and twenty five percent (25%) reported that they had received longer term weather predictions covering the next 2-3 months.



**Table 8.1. Types of weather information received by percentage of households**

Type of weather or climate information received	Number of households	Percentage of households
Received some type of weather information	82	59
Information about the start of the rainy season	55	39
Forecast of extreme weather event	55	39
Weather forecast for next 2-3 days	18	13
Weather forecast for next 2-3 months	35	25

The most commonly reported sources of weather related information were radio and friend/relatives/neighbors (Table 8.2).

**Table 8.2. Sources of weather related information by type of forecast and percentage\* of households**

Sources of weather information	Types of weather information received							
	Extreme weather		Start of rainy season		2-3 day forecast		2-3 month forecast	
	No.	%	No.	%	No.	%	No.	%
Radio	36	65	36	65	13	72	17	49
Friend, relatives, neighbors	17	31	15	27	4	22	16	46
Your own observations	3	6	1	2	0	0	0	0
Traditional forecaster/Indigenous knowledge	2	4	1	2	0	0	0	0
Television	2	4	2	4	1	6	2	6
Local group/gathering/meetings	2	4	2	4	0	0	0	0
Other	2	4	1	2	0	0	0	0
Government agricultural extension or veterinary officers	1	2	2	4	0	0	0	0
Cell phones	1	2	0	0	0	0	0	0

\* Percentages are based on the number of people that reported to have received each type of information. See Table 8.1.

Among the thirty nine percent (39%) of households that reported to have received information about extreme weather events, forty six percent (46%) reported that the information was received by females, twenty seven percent (27%) reported that the information was received by males, and twenty six percent (26%) reported the information to have been received by both males and females (Table 8.3). The same percentage of households reported to have received information about the start of the rainy season, with a similar distribution of information recipients.

Thirteen percent (13%) of households reported to have received 2-3 day weather forecasts, with the information reported to have been received equally by women (33%), men (33%), and both (33%). Two to three month weather forecasts were reported to have been received by twenty five percent (25%) of households with the information most often received by females (43%), followed by both (37%), and males (20%).

**Table 8.3 Percentages of households receiving weather related information**

Types of weather forecast information received	Households receiving information		Who received the information*					
			Male		Female		Both	
	No.	%	No.	%	No.	%	No.	%
Extreme weather events**	55	39	15	27	25	46	14	26
Start of the rain	55	39	15	27	25	46	15	27
2-3 day weather forecast	18	13	6	33	6	33	6	33
2-3 month weather forecast	35	25	7	20	15	43	13	37

\*These percentages are the percentage of households that received the particular type of information.

\*\* One response missing from system, thus the addition of the number of males, females, and both equals 54 and not 55, which was the total number of households reporting to have received this type of information.

### ***Farm-Related Advice Received in Weather Forecasts and Use of the Advice to Make Farm Changes***

Fewer than half of households reported that the weather information they received included any type of advice about how to use the information for making farm decisions. Among those that said the forecast did include usage information, two thirds (67%) reported that they used the advice related to the forecast of an extreme weather event, and fifty four percent (54%) reported that they used the information related to the start of the rainy season (Table 8.4).

**Table 8.4. Percentage of households reporting that weather forecast information included advice on how to use the information and the percentage of households that reported having used the advice**

Types of weather forecast information received	Number of households receiving	Forecast included advice about how to use information in farming*		Household were able to use this advice**	
		No.	%	No.	%
Extreme weather forecast	55	18	33	12	67
Start of the rain	55	24	44	13	54
2-3 day forecast	18	5	28	1	20
2-3 month forecast	35	9	26	1	11

\*These percentages are the percentage of households that received the particular type of information.

\*\*These percentages are the percentage of households that said the information also included advice.

Little specific information was provided about the types of changes made to the agricultural system following the receipt of weather and/or climate related information by households. Following their receipt of information about extreme weather events, five percent (5%) of farmers reported that they made changes to their land management practices, four percent (4%) said they made changes to their activity timing, one percent (1%) reported having made a change in the inputs used, and two percent (2%) reported to have made other changes.

**Table 8.5. Types of farm changes made after receiving weather forecast, by number and percentage of households**

Type of forecast received	Types of changes made following weather forecast and advice							
	Land Management		Change in inputs		Change in activity timing		Other	
	No.	%	No.	%	No.	%	No.	%
Extreme weather	7	5	1	1	5	4	3	2
Start of the rain	0		0		0		1	1
2-3 day forecast	0		0		0		0	
2-3 month forecast	0		0		0		0	

**Discussion**

Radio, Friends, relatives and neighbours are the most common sources of weather and climate-related information. Nearly twice as many females as males receive weather-related information. Less than half of households that received weather information included some advice on how to use the information for making farm decisions. Most information received was related to either the start of the rainy season or extreme weather events. Very few changes to the farm management decisions/changes were made based on this information.

**9.0 Climate Related Crises**

Eighty seven percent (87%) of respondents reported that their household has faced a climate related crisis within the last five years. One fourth (25%) reported that they received some type of assistance following the crisis, with the majority of those receiving assistance reporting that it came from friend/family (94%), with seven percent (7%) reporting assistance from government agencies and three percent (3) reporting assistance from church organizations.