



FHI/MOZAMBIQUE
DEVELOPMENT ACTIVITY PROPOSAL

AGRICULTURE BASELINE SURVEY

Survey Designed and Led by
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EXECUTIVE SUMMARY

The 1997 Baseline Survey was conducted in the districts of Nhamatanda and Marromeu in Sofala province to collect agricultural and socio-economic baseline data to be used for subsequent monitoring and evaluation of FHI/M's USAID-funded Development Activity Proposal (DAP). Data was collected between August 18 and 29, 1997 from 600 households in sixteen communities. Three hundred households from eight target communities were sampled in each district.

Population Data

The average number of family members (6.0) was similar in the two target districts, with the proportion of females exceeding the proportion of males in the 0 to 9 and 10 to 55 years age groups. The frequency of female-headed households was relatively low, with 6.7% of households in Marromeu and 16.0% of households in Nhamatanda being headed by a woman.

Economic Data

In both districts, the overwhelming majority of households surveyed (98.7%) were subsistence farmers. The proportion of subsistence farming households was similar among female- and male-headed households. Few households (29.7% in Marromeu and 34.3% in Nhamatanda) obtained income from crop sales, reflecting the low levels of production obtained from the 1996/97 cropping season caused by widespread floods. Staples and oilseed crops were sold by a little over one-quarter of the households interviewed, while vegetables were sold by 8%. Nevertheless, the income generated from vegetable sales was equivalent to that obtained from the sale of staples/oilseed crops in Marromeu and was twice that generated from staples/oilseed sales in Nhamatanda. These results illustrate the very low level of surplus staples/oilseed crop production obtained from the 1996-7 cropping season and the higher commercial value of horticultural crops. The average income generated from crop sales was US\$ 6.62 in Marromeu and US\$ 28.13 in Nhamatanda. Overall, male-headed households generated more income from crop sales than female-headed households. Some between-district variation was apparent for vegetable sales.

Income-generating activities represented the most important source of income for both interviewees and other household members, with 52.5% of the interviewees and 58% of the households generating income through such activities. Opportunities for income generation were higher in Nhamatanda than in Marromeu. The most common income-generating activities were the buying and selling of agricultural products or manufactured goods, particularly in Nhamatanda, and the production and sale of artisan products and alcoholic drinks, especially in Marromeu. Employment or labor contributed to household income in 45% of households in Marromeu and 50% of households in Nhamatanda. The employment rate was 9% and 16% in Marromeu and Nhamatanda, respectively, with males being two to three times more likely to be employed than females. One-quarter of households surveyed received income from remittances. Data obtained for a number of wealth indicators demonstrate that households in Nhamatanda have a slightly higher standard of living than households in Marromeu.

Agricultural Data

Cultivated Land Area

The average number of fields planted during the 1996-7 growing season was higher in Marromeu (2.5) than in Nhamatanda (1.8), while the total area cultivated was slightly smaller in Marromeu (2.03 hectares) than in Nhamatanda (2.10 hectares). Households surveyed planted an average of 0.07 hectares during the horticultural season. Female-headed households tended to plant fewer, smaller fields than male-headed households.

Major Staples and Oilseed Crop Production

The households surveyed grew an average of 4.2 staples/oilseed crops in Marromeu and 2.9 staples/oilseed crops in Nhamatanda, respectively. Only 27% of households surveyed sold some of

their staples/oilseed produce, selling an average of 1.2 crops. Maize was the most important crop in both districts, being planted by 96% of households in Marromeu and by all households in Nhamatanda. Each of sorghum, rice, millet and sweet potato were grown by over 60% of households in Marromeu, while sorghum, cowpea and sweet potato were planted by around 40% of households in Nhamatanda. The production of oilseed crops (groundnut, sesame and sunflower) was largely limited to Nhamatanda and cassava limited to Marromeu. The only crop of significant importance in terms of crop sales was maize. The largest areas in both districts were planted to maize (0.86 ha in Marromeu and 1.41 ha in Nhamatanda), with over 0.5 ha planted to sorghum and rice.

The 1996/97 cereal season was severely affected by widespread flooding. Maize crop failure was reported by 23% of households in Marromeu and by 4% of households in Nhamatanda, respectively. In the case of sorghum, millet, cowpea, common bean, and cassava, between one-quarter and one-third of households suffered total crop losses. Failure of pigeon pea, sesame and sweet potato crops was largely restricted to Nhamatanda. Groundnut and rice crops suffered little from the floods. Farmer-estimated yields were very low, even under "normal" production conditions, suggesting that farmers may have under-reported their production. Farmer-estimated yields were compared against physical measurements of crop yields carried out by FHI/M extension technicians. Inter-cropping was more common in Nhamatanda than in Marromeu. No consistent effects of mono-cropping versus inter-cropping on crop yields were observed.

Food Security Situation

The farmer-estimated harvest data was used to determine the number of months supply of grains, roots, staples (grains plus roots) and legumes/oilseeds on a household-to-household basis. These results suggest that one-third of households in Marromeu and one-quarter of households in Nhamatanda have less than three months supply of staples. In each district, approximately 28% of the households surveyed have between three and six months supply and around 15% have up to nine months supply of staples. Households in Marromeu and Nhamatanda have an average of 0.8 and 1.9 months supply of legumes/oilseeds, respectively. The food security situation is particularly poor in the communities of K. Kaunda, Chueza and Cundue in Marromeu and in the community of Muda in Nhamatanda.

Production Constraints

The 1996-7 seasons' production of all crops was considered by the majority of interviewees to be less than that of the 1995-6 season. Ninety-two percent of maize producers experienced crop losses. The majority of these households lost 25% or more of their crop, with one-third to one-half of farmers losing more than 75% of their crop. One-quarter of rice producers, however, felt that their rice production was higher than that of the 1995-6 season. All except three households cited at least one production constraint. The most common production constraints in both districts were heavy rains/floods (89% of households surveyed) and rodents (47%), with strong winds/lodging limiting production in 47% of households in Nhamatanda. Losses due to birds were a problem in both districts (19%) and insects were cited by 12% of the households in Nhamatanda.

Post-harvest Storage of Agricultural Products

Ninety percent of households stored the principal food grains following the 1995-6 season's harvest for an average of 6.1 months, with 46% of households storing for 12 months or more. Maize was the most frequently stored grain in both districts, being stored by 86% of the households surveyed. As expected all crops were stored principally for consumption (90% of households) and for seeds (74% of households). Maize was stored by 27% of households for sale later in the season. Storage for sale was also mentioned for cowpea, groundnut, cassava and sesame. A wide range of storage techniques is used in the target districts. A large proportion of farmers in Nhamatanda (83%) store their maize on the cob with the husk. This technique is less widely adopted in Marromeu (38% of households). The use of a granary with a roof was more widely used in Nhamatanda (57% of households) than in Marromeu (23%), and was used to store a wide range of crops. Between one-quarter and one-half of those households using a granary used fire underneath to control insects, but nobody used rat guards.

Although 77% of households lost some of their stored agricultural produce, the extent of these storage losses was limited. In the case of maize, for example, although 81% of households lost maize in storage, the majority (72%) suffered losses of 25% or less. Insects (principally weevils) and rodents were the major causes of storage losses. Farmer-estimates of the extent of their storage losses appear to be low, suggesting that farmers have a greater tolerance of poor quality stored grain.

Seed Supply

Seed saved from a previous harvest was the most important source of seeds in the two districts, being used by 66% of households in Marromeu and by 52% of households in Nhamatanda. In Nhamatanda, 52% of households used seed that was purchased or exchanged, while in Marromeu, only 23% of households used purchased/exchanged seeds. The majority of this seed was purchased from the local shop or market. This source of seed was more important in Nhamatanda (cited by 75% of households) than in Marromeu (by 58% of households). Family members or neighbors represented the most important source of exchanged seed, being used by 46% and 16% of households in Marromeu and Nhamatanda, respectively. Seed obtained free-of-charge, mostly from family members or neighbors, was used by 24% of households in Marromeu and by 14% of households in Nhamatanda. Seed preparation practices were used by 52% of households surveyed, the most common of which was to test seed germination prior to planting.

Other Agricultural Inputs

Almost all households surveyed owned at least one hoe. Machetes and axes were also relatively common. In Marromeu, the majority of agricultural instruments were purchased or exchanged (55% of households), with only 19% of households using donated tools. In Nhamatanda, the majority of interviewees (92%) used donated tools, while 75% also used tools obtained through purchase or exchange. Tools were principally purchased from the local shop or market (78% of households) or, in the case of Nhamatanda, from a shop in Beira (20% of households in Nhamatanda). Tools were exchanged for other products, mainly from family members or neighbors in 8% of the households. The majority of tools obtained free-of-charge were provided by family members or neighbors (38% of households), with donated tools also being provided by FHI/M, apparently from the last distribution in November 1994, (22%) or the DDA (16%).

Improved varieties were used by 40% of households in Nhamatanda and by 13% of households in Marromeu. Sacks, commonly used for the storage of agricultural produce, were used by 77% of households and chemical products (pesticides) were used by five surveyed households. The chemical products were either obtained from the local shop/market or from the DDA. Only two of these households had received appropriate training.

Livestock Production

Eighty-eight percent of households in Marromeu and 77% in Nhamatanda raised any type of livestock. Chickens or ducks were the most common form of livestock (owned by 79% of households), with pigs and goats being raised by 26% and 15% of households, respectively. The average herd size of pigs was 2.8 and for goats it was 4.8.

Vegetable Production

The proportion of households growing horticultural crops was low. 18% of households in Marromeu grew an average of 1.4 crops and 30% of households in Nhamatanda grew an average of 1.9 crops. The limited scale of vegetable production probably reflects a lack of seeds. The most popular crops were tomato, squash, kale and onion. In general, one-third or less of the households growing a particular crop sold some of the produce, with the exception of squash that was grown principally for consumption. Particularly large areas were planted of onion and garlic in Marromeu, as these crops store well and can be consumed or sold when the availability of food in the local market is limited.

Adoption of Improved Agricultural Practices

Interviewees were asked whether or not they used selected agricultural practices related to field preparation, planting methods, soil conservation, irrigation and post-harvest planning and management. Fifty percent of the households surveyed used some form of field preparation practice,

the most common being to incorporate organic matter before sowing (used by 32% of households) Twenty eight percent of households prepare their fields without burning and 19% leave trees in the field One or more improved planting practices was used by 83% of the households surveyed, with 53% of households planting in lines and reducing the number of seeds per hole, 44% of households inter-cropping cereals with legumes and 37% reducing the spacing between lines and plants Unfortunately, cereal/cereal inter-cropping is still a common practice in the target districts, used by 37% of households surveyed Households were also asked what soil conservation practices they used One-half of the households did not use any such technique The most common practices adopted were to prepare one's fields without burning, to rotate crops, or to construct barriers to control run-off (used by 28%, 11% and 10% of the households, respectively) The more commonly used methods of field pest control were inter-cropping (used by 58% of households), mechanical methods (30%) and crop rotations (11%) Of the households surveyed, 27% did not use any form of pest control One family used an irrigation pump Post-harvest planning and management methods were used by one-half of the households surveyed The calculation of an Improved Farm Management Knowledge score revealed that around 80% of households surveyed had adopted less than 10 improved farm management techniques and the remainder had adopted between 10 and 15 improved techniques

Agricultural Extension Assistance

Existing extension services, provided principally by FHI/M in collaboration with the DDA, have provided extension assistance to 50% of households in Marromeu and 29% of households in Nhamatanda Extension assistance was provided through individual field visits and/or by group, with an average of 3.5 visits per month Assisted households were shown to have adopted an average of three more improved agricultural practices than non-assisted households

Commercialization

Decisions on crop sales were made by the man alone in 43 % of the households, both the man and the woman in 38%, by the woman alone in 17%, and in 2% of the households the decision was made by adult children Two-thirds of the households in which the woman controlled crop sales were male-headed households In the majority (98%) of households, crops were sold because the household needed money Other reasons given in Nhamatanda were that buyers were available (15%) and to take advantage of good prices (10%) A higher proportion of households in Nhamatanda (63%) than in Marromeu (37%) did not experience problems with commercialization In Marromeu, the major problems experienced were the distance from the market (38% of the households), poor prices (37%), a lack of transport (28%) and a lack of buyers (17%) In Nhamatanda, on the other hand, the two main problems were poor prices (23%) and the distance from the market (10%) Information concerning market prices and buyers was obtained principally from other sellers (in 66% of households that sold produce), while family members/neighbors and buyers provided information to 51% and 21% of households, respectively Only ten interviewees belonged to a farmer's association or cooperative, five in each district Three of these interviewees said that the farmer's association carried out some kind of business activity Two farmer's associations bought and sold agricultural products and one of these also carried out the bulk sale of products produced by its members The other farmer's association processed and sold food products

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DEFINITION OF TERMS AND ABBREVIATIONS

CP	Caixa Postal
DDA	Direcção Distrital de Agricultura
DPCCN	Direcção de Prevenção e Combate as Calamidades Naturais
FHI/M	Food for the Hungry International
Ha	Hectare
IFMKS	Improved Farm Management Knowledge Score
Kg	Kilogram
MSU	Michigan State University
NGO	Non-governmental organization
ORAM	Associação Rural de Ajuda Mutua
SEMOZ	Sementes de Moçambique (the national seed company of Mozambique)
SPEAR	Sofala Province Extension and Agricultural Rehabilitation (project)
SRRP	Sofala Province Rural Rehabilitation Project
T/ha	tons per hectare
UNOMOZ	United Nations Operation in Mozambique
USAID	United States Agency for International Development
USAID/M	United States Agency for International Development/ Mozambique Mission
U S \$	US Dollars

INTRODUCTION

Food for the Hungry International – Mozambique (FHI/M) began relief operations in Sofala Province, Mozambique in 1989 in response to famine and chronic food insecurity caused by civil war, intermittent drought and a breakdown in rural distribution and marketing networks. Early efforts focused on providing food, clothing, medicine, seeds and tools to the internally displaced people who flooded the Beira corridor. In 1990, FHI/M began a transition from relief to rehabilitation and development by launching its Sofala Province Rural Rehabilitation Project (SRRP) with funding from USAID/M. The objective of the SRRP project was to help beneficiaries reduce dependency on relief assistance via increased agricultural production, income generation and rural employment. The SRRP project provided farmers in the districts of Dondo, Marromeu, Nhamatanda, Buzi and Gorongosa with crop seeds, implements, and agricultural extension and training. Following the conclusion of the SRRP in 1994, FHI/M expanded its agricultural development activities with its Sofala Province Extension and Rehabilitation Project (SPEAR). SPEAR had five major components: agricultural extension, human resource development, applied and adaptive research, sustainable seed supplies and agri-enterprise development, and has been very successful in promoting technology adoption and raising agricultural productivity in several food insecure districts of Sofala Province.

Though substantial gains made by FHI/M throughout the past several years have increased food security among the most vulnerable populations in Sofala Province, much of the province remains relatively food insecure due to the lingering effects of civil war and internal displacement, poverty, recurrent drought, floods and low agricultural productivity. Much work remains to be done to improve food availability, food access and food utilization. Through the USAID-funded Development Activity Proposal, FHI/M will target its rural food security activities to the districts of Nhamatanda and Marromeu. Nhamatanda District was severely affected by a regional drought in 1994/5 and, although production was very good in 1996, long-term food security remains a problem. Marromeu District has a high potential for agricultural production, but it has had moderate levels of food insecurity due to the legacy of war, cyclic drought, and pests. The overall goal of FHI/M's Development Activity Proposal is to increase food availability and access and improve food utilization for 209,520 men, women and children in sixteen participating communities in these target districts. An additional 112,000 people in the other 10 districts of Sofala will benefit annually from FHI/M's agricultural research findings and recommendations. The proposed increase in food security will be accomplished using an integrated approach focusing on agricultural productivity, marketing and enterprise development, and maternal-child health and nutrition.

FHI/M will measure the impact of the Development Activity Proposal with a monitoring and evaluation system which contains three components: baseline data collection and analysis, program monitoring, and impact/program evaluation. Obtaining reliable baseline data is critical to program planning, monitoring, and evaluation. This report presents the results of the Baseline Survey implemented in August 1997 and represents the primary data set for subsequent evaluation of the impact of the Development Activity Proposal. Secondary data sets from other reliable sources will be used to augment and cross-reference with these baseline data, as appropriate.

1. GEOGRAPHIC DESCRIPTION AND SURVEY RESEARCH METHODS

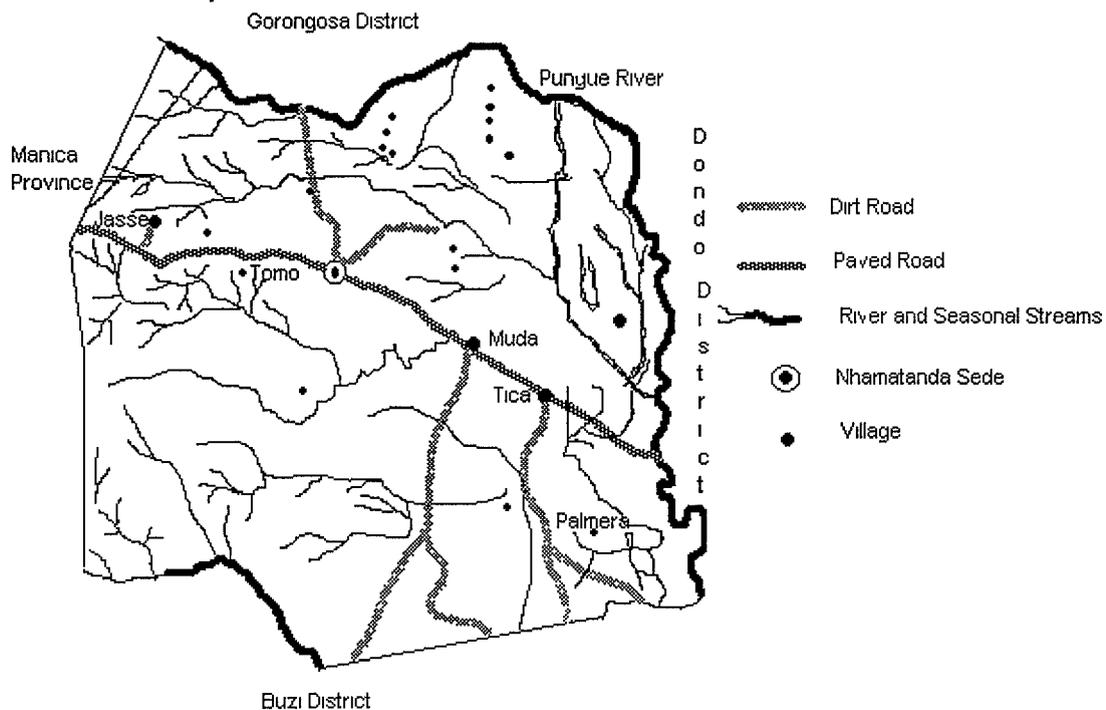
1.1 Geographic Description

FHI/M's Development Activity Proposal focuses on two districts in Sofala Province, Nhamatanda and Marromeu. A short description of these districts is given below.

Nhamatanda District, with a population of 135,000 according to the latest census gathered in August 1997, is situated along the "Beira Corridor", adjacent to Manica Province on its western border. The district was a major temporary resettlement/safe-haven area for Mozambican refugees returning from neighboring countries during the civil war. Although returnees have moved out of the "accommodation centers" and back to their areas of origin, many are making Nhamatanda their permanent home. The population of the district thus continues to grow rapidly, with great demands being put on local social services, including health facilities, which have a patient load second only to the provincial capital, Beira.

Nhamatanda has traditionally been an agriculturally productive area, although drought in recent years affected that significantly. Soils are fertile, many low-lying areas are well-watered by the Pungue River and its tributaries, and soil erosion is not a major problem over the generally flat terrain. Major food crops in the district are maize and sorghum, with a significant number of households also growing cowpeas, peanuts, and millet. Map 1 below shows Nhamatanda.

Map 1: Nhamatanda District, Sofala Province



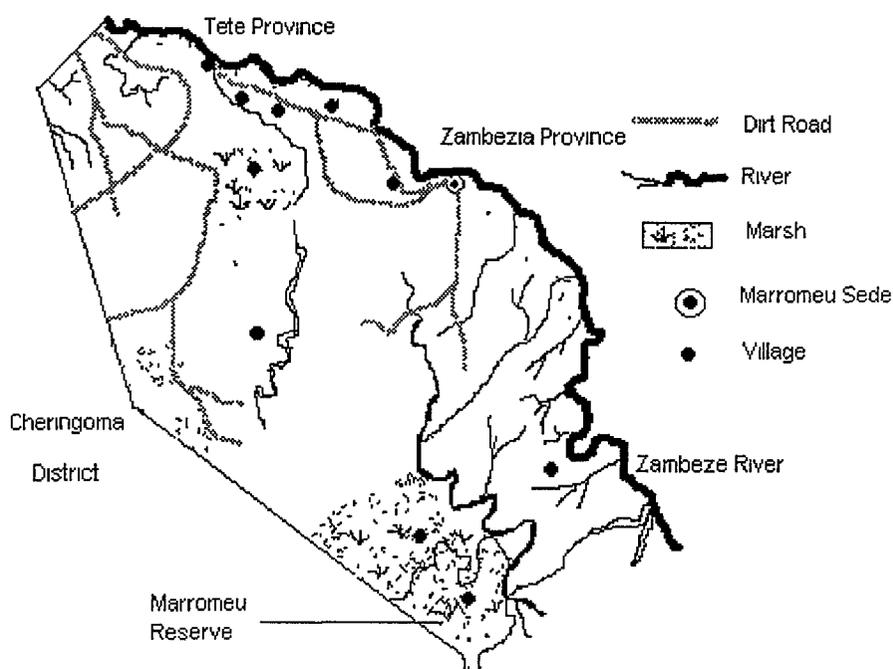
Marromeu, with a population of 71,000 as of August 1997, is located on the northern border of Sofala Province, along the southern bank of the Zambezi River. It was an area virtually cut off from the rest of the province during the civil war, the only easy access to the district being by air. Much of the area outside the district seat fell under the control and administration of Renamo, and the problem of *dupla administração*—where Renamo officials remain reluctant to cede authority to representatives of the elected government—continues to hinder development and relief work in parts of the district.

However, considerable advances have been made over the past years to improve the political administration in the area and have eased Marromeu into a more peaceful situation

Serious transport and communications difficulties plague Marromeu. Overland transport within the district is frequently problematic, with many areas inaccessible during parts of the year, and although the Beira-Marromeu road has now been opened, it can still take two days or more to make that trip during the rainy season.

Marromeu, with flat, low-lying terrain that is not prone to erosion, and with heavy, fertile soils, is an area of high agricultural potential. In the pre-independence period, the area was a major producer of sugar and other plantation crops. Although maize and sorghum are the major food crops, more than 50% of families in Marromeu also grow millet. Cassava and rice also play a significant part in household production. Map 2 below shows Marromeu District.

Map 2: Marromeu District, Sofala Province



1.2 Sample Description

The 1997 Baseline Survey focused on eight communities in each of the two target districts. Data concerning the total number of households within these sixteen target communities was obtained from the district authorities. These data were then used to calculate the total population of these communities, taking the average number of family members per household as 5.4 in Marromeu and 5.7 in Nhamatanda. These household size figures were obtained from the 1996 Mid-Term Survey. The number of households and the total population of the target communities are presented in Table 1. It should be noted that the population data presented in Table 1 does not represent the total population of the target districts, only that of the FHI/M-targeted communities. The analysis of FHI/M's 1995 Baseline Survey data for the lowest acceptable sample size per district showed that the minimum sample size was 1.5%. The minimum number of households to be surveyed, based on a 1.5% sample size, was calculated and is shown in Table 1, together with the actual number of households surveyed in each community and the percentage of each FHI/M-targeted community surveyed.

Table 1 Sample description for the 1997 Baseline Survey

Sample Description 1997 Baseline Survey						
District	Selected Community	Number of households in FHI/M-targeted communities*	Population of FHI/M-targeted communities*	Minimum Household Sample size 1 5%	Number of households surveyed per FHI/M-targeted community	Percentage of FHI/M-targeted Community surveyed
Marromeu		10,178	54,960	153	300	2 9
	Bauaze	2,230	12,042	33	70	3 1
	Safrique	659	3,559	10	20	3 0
	K Kaunda	1,966	10,616	29	50	2 5
	Nensa	848	4,579	13	30	3 5
	Cundue	1,768	9,547	27	50	2 8
	Megugune	1,048	5,659	16	30	2 9
	Vila Nova Salone	511	2,759	8	20	3 9
	Chueza	1,148	6,199	17	30	2 6
Nhamatanda		15,502	88,363	233	300	1 9
	Ramos/Micuzi	725	4,133	11	20	2 8
	Xiluvu	3,028	17,260	45	50	1 7
	Metachira Lomaco	4,615	26,306	69	90	2 0
	Nharuchanga	3,920	22,344	59	80	2 0
	Tica	1,171	6,675	18	20	1 7
	Jasse	587	3,346	9	10	1 7
	Muda	766	4,366	12	20	2 6
	Lamego	690	3,933	10	10	1 4
Both Districts		25,680	143,323	386	600	2 3

(*) The number of households in each target community was provided by the district authorities. The number of households was then divided by 5 4 and by 5 7 for Marromeu and Nhamatanda, respectively, to determine the target population of each district.

A total of 386 surveys were required for a 1 5% sample size. A larger sample of 600 surveys were implemented, 300 in each district, using a 30-cluster methodology. The total number of households in the eight target communities was divided into 30 clusters of similar population sizes and ten surveys were carried out in each cluster. In the district of Marromeu, for example, seven clusters of ten surveys were implemented in Bauaze, two clusters of ten surveys in Safrique, five clusters of ten surveys in K Kaunda, etc., giving a total of 30 clusters or 300 surveys (Table 1). On average, 2 9% of households in the targeted communities of Marromeu were surveyed and 1 9% of households in targeted communities of Nhamatanda were surveyed.

The gender of the person(s) interviewed is presented in Table 2. In approximately one-fifth of the households, both men and women from the same household were interviewed. The proportion of such joint interviews is high relative to earlier surveys and reflects the fact that the survey was implemented during a relatively "inactive" part of the agricultural calendar. In around 40% of surveys, either the man or the woman was interviewed.

Table 2 Gender of person(s) interviewed, as a percentage of total households interviewed, by district

District	Person(s) Interviewed (% of number of interviews)		
	Female	Male	Both
Marromeu	35.3	41.0	23.7
Nhamatanda	47.3	34.7	18.0
Both Districts	41.3	37.9	20.8

1.3 Questionnaire Development

The questionnaire used for the 1997 Baseline Survey was updated from the 1996 Mid-Term Survey. Some questions were excluded from the 1997 survey either because they were considered no longer appropriate or because sufficient data had already been collected through previous surveys. The following topics were excluded: population movement, school attendance, sources of cooking fuel, sufficiency of land under cultivation, problems limiting cultivated land area, characteristics of family fields, food donations received, quantities of seed purchased/saved, livestock sales, chicken vaccinations and cooking oil purchases and preferences. Interviewees were asked to identify their production problems in general terms, rather than being asked to provide crop-specific information as they were in earlier surveys. A similar, more general approach was adopted for the collection of data concerning seed sources.

Questions concerning income generation were more general in the 1997 Baseline Survey. Households were asked to identify their different sources of income from four major categories (crop sales, income-generating activities, employment, and remittances), but were not asked to provide information concerning the amount of money earned from each income source, with the exception of crop sales for which income data was collected. This change was made because it is widely felt that quantitative income data obtained once a year is inaccurate. Changes in household income will be measured indirectly by changes in household assets and through sample quarterly income surveys. Appropriate methods for measuring changes in household income by proxy are being developed together with USAID/M and the Michigan State University team working in the Ministry of Agriculture. The data collected concerning household wealth indicators was expanded to include the number and type of house(s) owned, and whether the household had purchased new clothes or meat in the previous 12 months. A number of household assets were identified, together with the MSU team, which are indicative of household wealth, namely three household furniture items (wooden table, wooden bed and mattress) and four luxury items (radio, bicycle, motorcycle and sewing machine). As a consequence, a number of household possessions included in earlier surveys were deleted (plate, pot, lamp, chair, and watch). Questions concerning family size, gender distribution and employment were asked again, to update the anthropological database.

Questions concerning food/oilseed/vegetable crops cultivated and sold, land area under cultivation to individual crops, number of fields planted, the adoption of inter-cropping practices, farmer-estimated crop yields, and crop-specific storage methods and losses were asked again to monitor changes in these indices between cropping seasons. As in previous surveys, interviewees were asked whether they do/have received agricultural extension assistance and the nature of this assistance. However, in this survey, interviewees were not asked to provide an opinion about the usefulness of this extension assistance, or whether they had changed any of their agricultural practices as a consequence of this assistance.

The section in this survey concerning the adoption of improved agricultural practices was expanded to include a total of 28 practices. The practices were related to field preparation, planting methods, soil conservation and the maintenance of soil fertility, irrigation and post-harvest planning and

management. Instead of asking a direct question, such as "Do you burn your fields before planting", interviewees were asked how they prepare their soils. If they did not respond concerning burning, they were asked an either-or question to determine whether or not they burn their fields before planting. This method was adopted in an attempt to avoid interviewees saying that they use a technique which they know FHI/M is promoting, when they do not actually use that technique.

The questionnaire was pre-tested in Ramos and in Nhamatanda town in communities not targeted for the final survey, after which some questions were revised for better understanding by survey staff and persons interviewed. Additional modifications were made through extensive consultation with FHI/M extension staff and the research coordinator. The majority of qualitative questions were asked as open-ended questions which, after completion of the interview, were attributed to pre-defined categories.

1.4 Survey Team Selection and Training

Thirty people were involved in conducting the survey, 24 of which were FHI/M employees, four were former FHI/M employees and two were hired temporarily to work on the survey. All FHI/M staff and former-staff were selected on the basis of having survey experience, knowledge of the local languages (Sena and Ndau) and the geographic areas. The two temporary hires were selected after having submitted a Curriculum Vitae and in both cases they had worked on the FHI/M Mid-Term survey team. A five-day training course was conducted including the following activities: presentation of the questionnaire, translation into local languages, interviewing techniques and training of supervisors, and two days of field training and questionnaire revision. The field training was carried out in Nhamatanda town, a community that was not selected for the final survey. The survey staff was divided into nine teams, each with two or three interviewers and one supervisor. The supervisor was responsible for the assignment and distribution of interviewers in the communities, supervising the requested number of interviews to be done on a daily basis, data cleaning after the questionnaires were finished, and logistical assistance.

1.5 Survey Implementation

The survey was carried out over a two-week period, August 18 to 29, 1997. The sixteen target communities were divided into 30 clusters prior to the survey, as described in Section 1.2. The households to be interviewed within each cluster were selected by the surveyors in the field. They were instructed to make sure the selection was unbiased, i.e. to not skip houses because they looked either poor or wealthy, and to not skip houses because they were too far away. When arriving at the community representing the center of a cluster, the supervisor spun a bottle to randomly identify a direction to go in and flipped a coin. The surveyors would follow that direction, counting off a pre-determined number of houses. When they reached the edge of the community, they turned in the direction previously determined by the coin flip and continued in a concentric circle until the interviewers had completed the designated 10 surveys.

It must be understood that the term community in the Mozambican context is more related to an administrative entity, which means that in some rural areas the houses are spread over vast areas and walking distance between houses can be 10 to 15 minutes. In the extensive communities, surveyors were instructed to sample every second house to reduce walking distance, in the more densely populated villages they were instructed to sample every fifth house. Also, they were instructed to ask each household if they had been previously surveyed that day, and to skip the households responding positively. Usually, six to seven surveyors conducted the survey in one community in one day. Each survey took about 45 minutes to complete. All District Administrators and local officials were notified in advance of survey plans by Beira FHI/M staff, with follow-up by FHI/M District Supervisors. Local officials and FHI/M staff informed residents and requested that as many as possible remain near their homes on the day of the survey in each community.

2. SURVEY DATA PRESENTATION AND ANALYSIS

2.1 Population Data

2.1.1 Family Size and Gender Division

The average number of family members per household are presented in Table 3. The mean family size was similar in the two target districts, being slightly higher in Nhamatanda (6.1) compared with Marromeu (5.9). The maximum number of family members per household ranged from 16 in Nhamatanda to 22 in Marromeu. In both districts, there were more females than males, a common characteristic of families living in rural areas, and there was no difference in the gender division between districts.

Table 3 Average number of family members per household and division of gender per household, by district

District	Number of Households Surveyed	Average Number of Family Members (per Household)	Gender Division (among all households)	
			% Female	% Male
Marromeu	300	5.9	52.3	47.7
Nhamatanda	300	6.1	52.0	48.0
Both Districts	600	6.0	52.2	47.8

The average age and gender distribution per household is shown in Table 4 and the average percentage of family members per household in three different age groups is given in Table 5. In both districts, over 60% of family members were within the 10 to 55 years age group and young children (under 10 years) represented approximately one-third of the total population. However, Marromeu had a slightly younger population than Nhamatanda, with 34.1% of family members being less than 10 years old and only 5.3% of family members being 56 years or older. In both districts, the average number of females exceeded that of males in the 0 to 9 and the 10 to 55 years age groups, whereas the average number of males exceeded that of females in the 56 years or older age group. This difference was more marked in Marromeu than in Nhamatanda.

Table 4 Average number of family members by gender and age group per household, by district

District		Average Number of Family Members per Household			
		0 to 9 years	10 to 55 years	56 years or older	Total
Marromeu	Female	1.05	1.88	0.14	3.07
	Male	0.95	1.68	0.17	2.80
	Total	2.00	3.56	0.31	5.87
Nhamatanda	Female	0.88	2.09	0.19	3.16
	Male	0.83	1.89	0.20	2.92
	Total	1.71	3.98	0.39	6.08
Both Districts	Female	0.96	1.99	0.17	3.12
	Male	0.89	1.78	0.19	2.86
	Total	1.85	3.77	0.36	5.98

Table 5 Average percentage of family members per household, by age group and district

District	Average Percentage of Family Members per Household		
	0 to 9 years	10 to 55 years	56 years or older
Marromeu	34.1	60.6	5.3
Nhamatanda	28.1	65.5	6.4
Both Districts	30.9	63.1	6.0
Female	51.9%	52.8%	47.2%
Male	48.1%	47.2%	52.8%

Marromeu suffered much more during the war than Nhamatanda. This may have had an effect on the relative size of the adult male population, either through the forced conscription of adults and elder children into the armed forces, or by the movement of males of working age out of the district in search of education and employment. The fact that many men have more than one wife may have also contributed to the lower proportion of males than females detected in this survey. In Marromeu, the proportion of males in the 56 years or older age group was noticeably higher than that of females. This may be due to the fact that, after the war, older adult males tended to return to Marromeu in search of employment with Sena Sugar, which had been an important source of employment before the war. While the factory is currently not operating, generally, families have sent back one family member with the hope of receiving compensation or back pay from Sena Sugar.

As shown in Table 6, 2.3% and 5.7% of the households in Marromeu and Nhamatanda, respectively, claimed that there was no "Head of Household". This suggests that either the head of the household was absent at the time of the survey (for example working in another location), or that the household is headed by a family member who does not consider her/himself to be the "Head of the Household". The second option is supported by the fact that only 4 out of these 24 families regularly received remittances. When the sex of the senior member of these households is considered, one-half of these families in Marromeu and one-third of those in Nhamatanda were being managed by a female. When households having no/absent head of household were reclassified according to the sex of the senior member, the overall percentage of households headed by women was 6.7% in Marromeu and 16.0% in Nhamatanda.

Table 6 Frequency of absence of the head of household among surveyed households and the sex of the senior member of households with no/absent head of household, and the gender of the head of household* as a percentage of total households interviewed, by district

District	Families with No/Absent Head of Household *		Gender of Head of Household Following Reclassification of Families with No/Absent Head					
	% of total households	# of households	Senior Member (# of households)		(% of total households and absolute number of households)			
			Female	Male	Female		Male	
					%	#	%	#
Marromeu	2.3	7	4	3	6.7	20	93.3	280
Nhamatanda	5.7	17	11	6	16.0	48	84.0	252
Both Districts	4.0	24	15	9	11.3	68	88.7	532

(*) Twenty four out of 600 interviewees said that there was no "Head" of their household. The sex of the most senior member of these households was determined in order to classify them into Female/Male-Headed households.

Although the frequency of female-headed households is low, particularly in Marromeu, the results are comparable to those of other surveys carried out by FHI/M in these districts. FHI/M surveys focus on the household unit rather than on the family unit(s) which make up each household. These results reflect the fact that women living as part of a household with multiple wives, but having their own economic entity, were not considered as family heads in this survey.

The age of the female and male heads of households is presented in Table 7. In both districts, over 80% of the male heads of household were between 10 and 55 years of age, while approximately 18% were older than 55 years. Among the female-headed households the situation differed between districts. In Marromeu, 85% of the female heads of household were between 10 and 55 years of age and the remaining households were headed by a women of 56 years or older. In Nhamatanda, a higher proportion of female-headed households (37.5%) were managed by elderly women.

Table 7 Average percentage of female and male heads of household*, by age group and district

District	Female Heads of Household (% of female-headed households)			Male Heads of Household (% of male-headed households)		
	0 to 9 years	10 to 55 years	56 years or older	0 to 9 years	10 to 55 years	56 years or older
Marromeu	0	85.0	15.0	0.4	82.1	17.5
Nhamatanda	0	62.5	37.5	0.0	81.0	19.0
Both Districts	0	69.1	30.9	0.2	81.6	18.2

(*): As described in Table 6, the sex of the senior member of those households who claimed that there was no "Head" of their household was determined in order to classify them into Female/Male-Headed households (&). One household in Marromeu was headed by a boy of less than 10 years of age.

2.2 Economic Data

2.2.1 Subsistence Farming

FHI/M surveys have traditionally sought to determine the proportion of households that can be considered to be "subsistence farmers". The term "subsistence farmers", as applied to households, is used to refer to those households in which the primary occupation is farming, and the amount of farm produce sold (if any) is less than that kept for the family's own needs. As the 1997 Baseline Survey did not ask interviewees about the primary occupation of each member of the family, the first criterion was sought by determining what proportion of the interviewed households owned a farm. The second criterion was sought by analyzing the crop sales data from the 1996-7 rainy and dry seasons, as done for the FHI/M 1996 Mid-Term Survey. If the income from crop sales was less than U.S. \$100, the family's farming activities were considered to be of a subsistence nature. The percentage of households considered to be subsistence farmers is given in Table 8.

As expected, all families surveyed in both districts owned a farm. This criterion alone is therefore not very helpful in distinguishing non-subsistence farming families from those families who are truly subsistence farmers. The criterion based on the level of income generated from crop sales is more helpful. In Marromeu, all families generated less than U.S. \$100 from crop sales and were therefore considered to be subsistence farmers. In Nhamatanda, on the other hand, seven out of 300 families generated more than U.S. \$100 from crop sales. The overall percentage of subsistence farmers in this district was 97.3%. There was no apparent difference in the ability of female-headed and male-headed households to generate income from crop sales.

Table 8 Percentage of households considered to be subsistence farmers, by district

District	Income from Crop Sales < U S \$100*			
	Own a farm (% of total households)	% of Female-Headed Households **	% of Male-Headed Households	% of Total Households
Marromeu	100	100	100	100
Nhamatanda	100	97.9	97.2	97.3
Both Districts	100	98.5	98.7	98.7

(*) Income from crop sales represents income generated from the sale of food/oilseed crops and vegetables

(**) As described in Table 6, the sex of the most senior member of those households who claimed that there was no "Head" of their household was determined in order to classify them into Female/Male-Headed households

2.2.2 Income Sources

Various questions in the 1997 Baseline Survey were designed to identify the different sources of household income. The interviewee was asked whether each family member individually contributed to household income through income-generating activities, such as the preparation/sale of alcoholic drinks and charcoal, carpentry or the production/sale of artisan products, etc and/or by being employed by a third party. Interviewees were also asked whether their household received money from remittances. Households were also classified on the basis of whether or not they obtained income from crop sales (food/oil crops and vegetable crops). Only those households that provided data concerning the quantity of a particular crop sold and the amount of money obtained were considered to have generated income from crop sales. Twenty interviewees claimed to have sold crops but did not provide complete quantity and price data, and were therefore excluded from the set of households receiving income from crop sales. In addition to the above-mentioned questions concerning the household in general, each interviewee was asked whether he/she had any income-generating activities of his/her own and/or whether he/she was employed by a third party.

The percentage of households obtaining income from crop sales, having at least one member bringing in money from income-generating activities and/or employment, or receiving income from remittances is shown in Table 9. The percentage of interviewees obtaining income from income-generating activities and/or employment is presented in the same table. This information was also used to determine the percentage of households with no income source.

Surprisingly few households (29.7% in Marromeu and 34.3% in Nhamatanda) obtained income from crop sales, supporting the fact that the majority of households in the target districts are subsistence farmers and consume the majority of their farm produce. These results also reflect the low levels of production obtained from the 1996-7 cropping season, as a consequence of widespread floods. The higher proportion of households selling agricultural produce in Nhamatanda reflects the fact that there are considerably more marketing opportunities in Nhamatanda than in Marromeu, due to its location on the Beira corridor. It should be noted, however, that farmers are generally reluctant to give the impression that their level of crop production is high and that they were able to sell a proportion of their produce. As a consequence, some interviewees may have denied selling produce when they did, in fact, sell a proportion of their produce. As mentioned above, only those households that provided quantity and price data were considered to have sold produce. These factors will have resulted in an underestimation of the number of households that obtained income from crop sales.

Table 9 Sources of household income as a percentage of total households, sources of interviewees income as a percentage of interviewees, and the percentage of households with no income source, by district

District	Sources of Household Income Generated by Any Member* (% of total households)				Source of Interviewees Income (% of interviewees)		Households with No Income Source (% of total households)
	Crop Sales	Income-Generating Activities	Employment or Labor	Remittances	Income-Generating Activities	Employment or Labor	
Marromeu	29.7	50.4	45.0	20.0	47.0	2.0	22.7
Nhamatanda	34.3	66.3	50.0	26.7	58.0	4.3	7.0
Both Districts	32.0	57.9	48.5	23.3	52.5	3.2	14.8

(*) Data from income sources refers to the previous year, i.e. the period August 1996 to July 1997. Income from income-generating activities represents activities such as the sale of alcoholic drinks and charcoal, carpentry, the production/sale of artisan products, etc. Income from employment or labor includes regular wages from employment as well as irregular wages from day labor. As the majority of households have more than one income source, the total percentage exceeds 100.

Income-generating activities represented the most important source of income for both interviewees and other household members, with 52.5% of the interviewees and 57.9% of the households generating income through such activities. Opportunities for income-generation are much more restricted in Marromeu than Nhamatanda, with 50.4% of the households in Marromeu and 66.3% of the households in Nhamatanda earning money through income-generating activities. This result reflects the fact that the communities targeted by the survey in Nhamatanda are located along the Beira corridor and there are therefore many opportunities for the production of value-added products and the buying/selling of manufactured goods. In comparison, the communities targeted in Marromeu are both isolated from each other and from other population centers, restricting demand for value-added products and access to manufactured goods for resale. Unfortunately, although important, this income source is irregular in nature, as it includes the preparation/sale of alcoholic beverages, the collection/sale of construction materials, and the buying/selling of agricultural products, all of which are subject to seasonal fluctuations.

Table 9 indicates that, although the proportion of interviewees that are employed by a third party is low, with an average of 3.2% across districts, the employment of other members of the household makes an important contribution to household income. In Nhamatanda, one-half of the households interviewed had at least one family member who worked for a third party. In Marromeu, the availability of employment opportunities is lower than in Nhamatanda, with 45% of households having at least one employed family member. Farmers in Nhamatanda tend to cultivate larger land areas than in Marromeu, because there is an all-year-around market for agricultural produce. As a consequence, there are more opportunities for seasonal employment in Nhamatanda on the farms of the more wealthy farmers. It should be remembered that, although in some households this may represent all-year-around regular income, it is more likely that this income represents irregular wages from day labor and is therefore seasonal.

Remittances contribute to household income in approximately one-quarter of the households interviewed in both districts.

There is a large difference in the percentage of households who have no income source between target districts. In Marromeu, 22.7% of the households interviewed had no income source, whereas only 7.0% of households in Nhamatanda had no income source. These results reflect the lower levels of crop sales, fewer opportunities for income generation and employment in Marromeu than in Nhamatanda. Nevertheless, the data for Marromeu is much higher than that obtained from the 1995 Baseline Survey and 1996 Mid-Term Survey. This is probably partly because the floods and poor

levels of crop production reduced opportunities for seasonal on-farm employment during the 1996-7 cropping season. In Nhamatanda, the percentage of households having no income source is lower than in earlier surveys, probably because the target communities are benefiting from the gradual increase in commercial activity along the Beira corridor.

The average number of income sources per household was calculated using the information presented in Table 9. In the case of households generating income through income-generating activities or through employment/labor, each household member who generates income was considered to represent an individual income source. Therefore, if two members of a household each had some form of income-generating activity and the interviewee was employed, but the household did not receive income from crop sales or remittances, then the number of income sources for this household was 3. The average number of income sources per household was 2.2 in Marromeu and 2.9 in Nhamatanda, with an average of 2.5 across districts.

Data concerning the percentage of households that sold food/oilseed crops and vegetables are presented in Table 10. This table shows that the majority of households that sold any crop product, sold food and/or oilseed crops rather than vegetables, with 26.5% of the total households selling food/oilseed crops and only 7.7% selling vegetables. At a district level, the sale of food/oilseed crops was of prime importance in Marromeu, with only 3.7% of the households selling vegetables. In Nhamatanda, however, the sale of vegetables was relatively more important, with 11.7% of the households selling vegetables.

Table 10 Percentage of total households that sold crops (i.e. food/oilseed crops and vegetables)* and the absolute number of households selling each type of crop, by district

District	Type of Crop Sold (% of total households)					
	Food/Oilseed Crops		Vegetables		Total	
	%	#	%	#	%	#
Marromeu	27.3	82	3.7	11	29.7	89
Nhamatanda	25.7	77	11.7	35	34.3	103
Both Districts	26.5	159	7.7	46	32.0	192

(*) Data from crop sales refers to the period August 1996 to July 1997. Food/oilseed crops include maize, sorghum, rice, cowpea, pigeon pea, common bean, groundnut, millet, cassava, sweet potato, sunflower and sesame. Vegetables include onion, kale, cabbage, tomato, garlic, squash, lettuce, carrot, green pepper and chili pepper. Only those families who provided complete quantity and price data are included in the above analysis.

Table 10 showed that very few families in the target districts produced sufficient agricultural produce during the 1996-7 season to enable them to sell some of this produce to generate income. The average income generated from the sale of food/oilseed crops and vegetables by these households was very low (see Table 11), suggesting that the quantities sold were relatively small. In Marromeu, the income generated from the sale of food/oilseed crops was equivalent to that generated from the sale of vegetables. In Nhamatanda, however, the sale of vegetables generated more than twice as much income as the sale of food/oilseed crops. These data illustrate the very low level of surplus food/oilseed crop production obtained from the 1996-7 growing season, particularly in Marromeu, and the relatively higher commercial value of horticultural crops than food crops. It should be noted that at the time of the survey (August 1997), the horticultural season had not yet finished. Therefore, these results are unlikely to give a complete picture of the proportion of households who generated income from the 1997 horticultural season and the amount of income generated. There was no consistent difference in the amount of income generated through crop sales, between female- and male-headed households, as shown in Table 12. In general, male-headed households obtained a greater income from crop sales than female-headed households, although the average income generated from vegetable sales was higher in Marromeu from female-headed households than from male-headed households.

Table 11 Average income generated per household in U S \$ from crop sales (i e food/oilseed crops and vegetables) among households reporting income from that source* and the absolute number of households reporting income from each source, by district

District	Average Income from Crop Sales in U S \$ (among households reporting income from that source)					
	Food/Oilseed Crops		Vegetables		Total	
	U S \$	#	U S \$	#	U S \$	#
Marromeu	6 33	82	6 39	11	6 62	89
Nhamatanda	18 31	77	42 51	35	28 13	103
Both Districts	12 13	159	33,96	46	18 18	192

(*) Data from crop sales refers to the period August 1996 to July 1997 Food/oilseed crops include maize, sorghum, rice, cowpea, pigeon pea, common bean, groundnut, millet, cassava, sweet potato, sunflower and sesame Vegetables include onion, kale, cabbage, tomato, garlic, squash, lettuce, carrot, green pepper and chili pepper Only those families who provided complete quantity and price data are included in the above analysis

Table 12 Average income generated per household in U S \$ from crop sales (i e food/oilseed crops and vegetables) among female- and male-headed households reporting income from that source*, by district

District	Average Income from Crop Sales in U S \$ (among households reporting income from that source)					
	Female-Headed Households			Male-Headed Households		
	Food/Oilseed Crops	Vegetables	Average	Food/Oilseed Crops	Vegetables	Average
Marromeu	2 38	14 46	8 42	6 42	4 60	6 53
Nhamatanda	20 96	13 29	18 56	17 87	47 37	29 89
Both Districts	18 10	14 25	16 75	11 60	37 50	18 35

(*) Data from crop sales refers to the period August 1996 to July 1997 Food/oilseed crops include maize, sorghum, rice, cowpea, pigeon pea, common bean, groundnut, millet, cassava, sweet potato, sunflower and sesame Vegetables include onion, kale, cabbage, tomato, garlic, squash, lettuce, carrot, green pepper and chili pepper Only those families who provided complete quantity and price data are included in the above analysis

2 2 3 Employment Data

Table 13 lists the percentage of households with at least one wage-earner, the average number of wage-earners per household, and the employment rate as a percentage of household members within the 10 to 55 years age group The term "wage-earner" is used to describe anyone reporting any type of paid employment Households with at least one wage-earner ranged from 28% in Marromeu to 51% in Nhamatanda The average number of wage-earners per household was 0 36 in Marromeu and 0 77 in Nhamatanda Farm labor employment opportunities are generally higher in Nhamatanda than in Marromeu because the farms are larger Nevertheless, it must be remembered that such employment opportunities are irregular in nature and are strongly influenced by seasonal fluctuations The 1997 Baseline Survey data concerning the percentage of households with at least one wage-earner and the average number of wage-earners per household (particularly in Marromeu) are low compared with previous FHI/M surveys carried out in the same districts This is probably due to a reduction in farm labor opportunities caused by the 1996-7 season's floods

The employment rate of household members between the ages of 10 and 55 was very low, ranging from 9% in Marromeu to 16% in Nhamatanda In both districts, males within this age group are two to three times more likely to be employed than females

Table 13 Percentage of households with at least one wage-earner as a percentage of total households, the average number of wage-earners per household, and the employment rate within the 10 to 55 years age group, by district

District	Households with at least one Wage-earner (% of total)	Average Number of Wage-Earners per Household (among total households)	Employment Rate (% of individuals in the 10 to 55 years age group)		
			Female	Male	Total
Marromeu	28	0.36	4	14	9
Nhamatanda	51	0.77	10	24	16
Both Districts	40	0.57	7	19	13

Table 14 shows the percentage of interviewees who are self-employed, because they carry out some form of income-generating activity, and/or employed by a third party and the percentage who are neither self-employed nor employed. The proportion of interviewees who can be considered self-employed is 47% in Marromeu and 61% in Nhamatanda. The majority of self-employed interviewees (83%) have only one income-generating activity, while 17% have two or three income-generating activities. Very low levels of employment by a third party were detected (3% across districts) and a small number of interviewees, 1 in Marromeu and 9 in Nhamatanda, were both employed and carried out some kind of income-generating activity. In the remaining households, the interviewee was neither self-employed nor employed by a third party.

Table 14 Percentage of interviewees and the absolute number of interviewees who are self-employed and/or employed by a third party, as a percentage of total interviewees, by district

District	Interviewees who are Self-Employed and/or Employed (% of total interviewees and absolute number of interviewees)							
	Self-employed		Employed		Both		Neither	
	%	#	%	#	%	#	%	#
Marromeu	47	141	2	6	0	1	51	152
Nhamatanda	58	174	4	13	3	9	35	104
Both Districts	53	315	3	19	2	10	43	256

The percentage of female interviewees who are self-employed and/or employed by a third party is presented in Table 15. The majority of female interviewees are neither self-employed nor employed. Income-generating activities are the most common form of "employment" for women (46% of female interviewees). Opportunities for income-generation by women are clearly greater in Nhamatanda than in Marromeu. Only four of the female interviewees were employed by a third party.

Table 15 Percentage of female interviewees and the absolute number of female interviewees who are self-employed and/or employed by a third party, as a percentage of female interviewees, by district

District	Female Interviewees who are Self-Employed and/or Employed (% of female interviewees and absolute number of female interviewees)							
	Self-employed		Employed		Both		Neither	
	%	#	%	#	%	#	%	#
Marromeu	35	37	0	0	0	0	65	69
Nhamatanda	52	73	1	2	1	2	46	64
Both Districts	45	110	1	2	1	2	53	133

The types of businesses or activities being implemented by self-employed interviewees are detailed in Table 16. The most common income-generating activities are the buying/selling of agricultural products, the production/sale of artisan products and of alcoholic drinks, and the buying/selling of manufactured products. Most activities, with the exception of the buying/selling of manufactured products, show large differences in importance between the two districts. In Nhamatanda, greater commercial activity and access to traders means that a larger proportion of interviewees generate income by buying/selling agricultural produce than they do in Marromeu. In Marromeu, on the other hand, a larger proportion of interviewees generate income through the production/sale of alcoholic drinks and artisan products for local use. With the exception of buying/selling manufactured products, the principal income-generating activities are seasonal in nature and do not provide a reliable source of income. Other income-generating activities were the sale of seeds and agricultural tools, the collection/sale of construction materials, baking, carpentry, making milk products, tailoring, operating a taxi, traditional healing, construction, radio repair, and private nursing.

A small number of interviewees in each district were employed by a third party. Table 17 shows the types of businesses with which such interviewees are employed. The most common forms of employment again include the buying/selling of agricultural products and the production/sale of alcoholic drinks. Other forms of employment include buying/selling of manufactured products and the production/sale of food items and artisan products. Sena Sugar was formally an important employer in Marromeu. However, this company is currently out of production.

2.2.4 Household Possessions

A number of questions were designed to determine the relative standard of living of households in the target districts. Information was collected concerning the number and type of house(s) owned, whether the household had bought new clothes or meat in the previous year, and the quantities the household owned of specific items in two categories of material goods (household furniture and "luxury" goods). The categories of material goods and items used in the 1997 Baseline Survey differed from previous FHI/M surveys and were as follows: household furniture (wooden table, wooden bed, and mattress) and "luxury" goods (radio, bicycle, motorcycle and sewing machine).

The average number of houses owned per household and the type of material used to construct the roof, the walls and the door of the house(s) is an indication of the wealth of the household. The average number of houses per household was very similar in the two districts, with most households owning between one and two houses (Table 18).

In the majority (over 90%) of the households interviewed, the roofs of the house(s) were made from grass or some other natural material. Zinc or lusalte was used by 5% of the households surveyed and plastic covering or a tarpaulin was used by 1% of the households surveyed.

Table 16 Type of business being operated by self-employed interviewees, as a percentage of self-employed interviewees, and the absolute number of self-employed interviewees operating each type of business, by district

Businesses Operated by Self-Employed Interviewees (% and absolute number of self-employed interviewees)																
District	Buying/ Selling Agricultural Products		Buying/ Selling Manufactured Products		Sale of Seeds and Agricultural Tools		Collection/ Sale of Construction Materials		Baking		Production/ Sale of Alcoholic Drinks		Carpentry		Production/ Sale of Artisan Products	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Marromeu	38	54	6	9	0	0	1	1	0	0	27	38	4	5	36	51
Nhamatanda	58	101	10	18	1	1	4	7	2	3	17	30	2	4	15	26
Both Districts	49	155	9	27	0	1	3	8	1	3	22	68	3	9	24	77

Businesses Operated by Self-Employed Interviewees (% and absolute number of self-employed interviewees)														
District	Making Milk Products		Tailoring		Operating A Taxi		Traditional Healing		Construction		Radio Repair		Private Nursing	
	%	#	%	#	%	#	%	#	%	#	%	#	%	#
Marromeu	1	1	0	0	0	1	1	2	0	1	0	1	0	0
Nhamatanda	2	3	2	4	0	1	2	3	0	0	0	1	0	1
Both Districts	1	4	1	4	1	2	2	5	0	1	1	2	0	1

Table 17 Type of business with which interviewees are employed, as a percentage of employed interviewees and the absolute number of interviewees in each type of business, by district

Businesses With Which Interviewees are Employed (% and absolute number of employed interviewees)													
District	Buying/Selling Agricultural Products		Buying/Selling Manufactured Products		Sale of Construction Materials		Production And Sale of Food Items		Production/Sale of Alcoholic Drinks		Production/ Sale of Artisan Products		
	%	#	%	#	%	#	%	#	%	#	%	#	
Marromeu	83	5	17	1	0	0	0	0	0	0	0	0	
Nhamatanda	39	5	8	1	23	3	8	1	31	4	15	2	
Both Districts	53	10	11	2	16	3	5	1	21	4	11	2	

Table 18 Average number of houses owned per household and the type of material used to construct the roof, as a percentage of total households, by district

District	Average Number of Houses (per household)	Type of Material Used to Construct the Roof (% of total households)		
		Grass or Other Natural Material	Zinc or Lusalite	Plastic Covering or Tarpauln
Marromeu	1.7	95	5	0
Nhamatanda	1.9	92	6	2
Both Districts	1.8	94	5	1

Details of the material used to construct the walls of the house(s) are given in Table 19. The majority of households used natural materials easily available in their locality. Wooden posts covered with mud was the most common form of wall construction in Nhamatanda, used by 51% of the households, while canes were the most common in Marromeu, used by 41% of households. Wooden posts covered with mud were also common in Marromeu (34% of households) but canes were hardly used in Nhamatanda. The use of bamboo and stakes was also fairly common in both districts. Cement blocks or burnt or sun-dried mud bricks were used by 36% of the wealthier families interviewed. An examination of the luxury goods owned by these families showed that four of these families owned a sewing machine and one owned a motorcycle.

Table 19 Type of material used to construct the walls of the house(s) owned by the households interviewed, as a percentage of total households, by district

District	Type of Material Used to Construct the Walls (% of total households)				
	Wooden Posts Covered with Mud	Sun-Dried Mud Bricks	Cement Blocks or Burnt Mud Bricks	Bamboo and Stakes	Canes
Marromeu	34	1	3	21	41
Nhamatanda	51	5	3	32	9
Both Districts	43	3	3	26	25

The types of material used to construct the door of the house(s) of the interviewees are presented in Table 20. One family in each district did not have a door on their house. Bamboo or cane was used by 65% of households surveyed, while wood was used by 20% of the households. Other materials used were tin panels, mats made from cane, and a "capulana" or some other textile.

Table 20 Type of material used to construct the door of the house(s) owned by the households interviewed, as a percentage of total households, by district

District	Type of Material Used to Construct the Door (% of total households)					
	Wood	Capulana or Other Textile	Bamboo Or Cane	Panels Made From Tin	Mat Made From Canes	No Door
Marromeu	16	0	72	5	6	0&
Nhamatanda	24	2	59	9	5	0&
Both Districts	20	1	65	7	6	0&

(&) One family in each district had no door

The ability of a household to buy new clothes or to buy meat is an indication of their access to cash. Table 21 presents the percentage of households that bought new clothes or meat during the year preceding the survey. In Marromeu, 20% of households purchased new clothes and 23% purchased meat during the year prior to the survey. In Nhamatanda, 32% of households purchased new clothes and 32% purchased meat. The similarity of the percentages for the two types of purchase within each district shows that once a household has access to income, that income may be used for "luxury" purchases, of which the purchase of new clothes or meat can be considered to be of similar priority.

Table 21 Percentage of households that bought new clothes or meat during the previous year, by district

District	Households that Bought New Clothes in Previous Year (% of total households)	Households that Bought Meat in Previous Year (% of total households)
Marromeu	20	23
Nhamatanda	32	32
Both Districts	26	27

The percentage of households owning different types of household furniture (wooden table, wooden bed, and mattress) and "luxury" goods (radio, bicycle, motorcycle and sewing machine) and the average number of units owned by households owning each item is presented in Table 22. The percentage of households possessing at least one item of each type of household furniture and at least one of any type of luxury goods are also shown in this table.

Of the three household furniture items selected, ownership of wooden tables was much more common than ownership of wooden beds or mattresses. While 15% of households in Marromeu and 24% of households in Nhamatanda owned wooden tables, only 5.3% and 12.3% in Marromeu and Nhamatanda, respectively, owned wooden beds. The frequency of ownership of mattresses was even lower in both districts. Most households owned one unit only of these items. Very few households surveyed owned at least one of each of these items, namely 2% in Marromeu and 5% in Nhamatanda.

The ownership of luxury goods was surprisingly common, with 33% of households in Marromeu and 51% of households in Nhamatanda owning at least one of the four types of luxury goods. Radios were the most common, with 29.7% of households in Marromeu and 41.7% of households in Nhamatanda owning radios. Clearly a radio is one of the first luxury items that a family might buy when it has access to cash and these data suggest that families are more likely to buy a radio than they are to buy a wooden table. Bicycles were quite popular in Nhamatanda, with 21.7% of households owning at least one bicycle, while only 7.0% of households in Marromeu owned a bicycle. It should be noted that soon after the survey had been completed, Sena Sugar paid the back salaries of a large number of former employees in Marromeu district, resulting in the appearance of a large number of new bicycles. Motorcycles were very rare, being owned by less than 1% of households in both districts, and sewing machines were slightly more common, particularly in Nhamatanda, where 4.3% of households owned a sewing machine. Again households tend to own only one unit of a particular luxury goods item.

Table 22 Percentage of households possessing selected household furniture and luxury goods items, as a percentage of total households, and the average number of units owned by households owning each item, by district

Item	District	Households Owning Selected Items and Average Number of Items Owned (% of total households and average number of units owned among households owning each item)					
		Marromeu		Nhamatanda		Both Districts	
		%	#	%	#	%	#
Household Furniture							
At least one of each item		2 0		5 0		3 0	
Wooden table		15 0	1 1	24 0	1 3	19 5	1 2
Wooden bed		5 3	1 0	12 3	1 4	8 8	1 3
Mattress		2 7	1 0	5 7	1 4	4 2	1 3
Luxury Goods							
At least one of any item		33 0		51 0		42 0	
Radio		29 7	1 1	41 7	1 2	35 7	1 2
Bicycle		7 0	1 1	21 7	1 1	14 3	1 1
Motorcycle		0 3	1 0	0 7	1 0	0 5	1 0
Sewing machine		1 7	1 0	4 3	1 2	3 0	1 1

The percentage of households owning selected agricultural instruments is shown in Table 23, with data concerning the average number of agricultural instruments owned by these families presented in Table 24. As the surveyed communities were subsistence farmers, all households surveyed in each district, with the exception of one family in Marromeu, owned at least one hoe, with most households owning between three and four hoes. Other common agricultural instruments were machetes and axes, with an average of between one and two machetes and axes being owned by over two-thirds of the households surveyed. Other instruments, such as spades, forks, scythes and files were owned by less than one-third of the households, with a slightly higher proportion of households in Nhamatanda owning these items. None of the households surveyed owned a plough for animal traction purposes.

2.3 Agricultural Data

This survey was designed to collect data concerning ten major agricultural topics, namely cultivated land area, major food and oilseed crop production, the food security situation, crop production constraints, post-harvest storage of agricultural produce, seed supply, other agricultural inputs, livestock production, vegetable production, and the adoption of improved agricultural practices. In this way, FHI/M will use this data to monitor farmers' constraints and address priority needs. The agricultural data are presented in Tables 25 to 80, and are described in the following sections.

2.3.1 Cultivated Land Area

The size of landholdings under cultivation is an important factor in the food and livelihood security of rural farming households. The average number of fields per household and the average area of land in cultivation during the 1996-7 rainy season and the 1997 dry season are presented in Table 25. The average number of fields planted during the 1996-7 growing season was higher in Marromeu (2.5) than in Nhamatanda (1.8), while the total area cultivated was slightly smaller in Marromeu.

Table 23 Percentage of households owning selected agricultural instruments, as a percentage of total households, by district

District	Households Owning Selected Agricultural Instruments (% of total households)								
	Hoe	Machete	Axe	Spade	Fork	Scythe	File	Plough for Animal Traction	No Agricultural Instruments
Marromeu	100&	83	69	4	3	11	25	0	0&
Nhamatanda	100	78	59	16	12	33	17	0	0
Both Districts	100	81	64	10	7	22	21	0	0&

(&) One household in Marromeu did not possess any hoes or any other agricultural instruments

Table 24 Average number of agricultural instruments per household, among households owning each type of agricultural instrument, by district

District	Average Number of Agricultural Instruments per Household (among households owning each type of agricultural instrument)								
	Hoe	Machete	Axe	Spade	Fork	Scythe	File	Plough for Animal Traction	
Marromeu	3.9	1.5	1.2	1.3	1.0	1.2	1.2	0	
Nhamatanda	3.7	1.6	1.3	1.2	1.1	1.2	1.2	0	
Both Districts	3.8	1.5	1.3	1.2	1.1	1.2	1.2	0	

The practice of planting more, smaller fields is common in Marromeu, with many families planting fields along the river bank and on the islands to take advantage of the high soil humidity, as well as on the higher, drought-prone land further away from the river. This practice is less common in Nhamatanda, where the availability of land is often limited, sometimes leading to land disputes.

In general, female-headed households planted fewer fields than male-headed households. The average land area cultivated by female-headed households was approximately two-thirds that of male-headed households. This trend in area under cultivation was evident in both districts during the principal cropping season and in Nhamatanda during the dry season. In Marromeu, female-headed households planted slightly larger areas to horticultural crops than male-headed households in that district.

Table 25 Average number of fields cultivated during the 1996-7 growing season and the average area of land under cultivation per household in the 1996-7 rainy and 1997 dry seasons, by district

District	Average Number of Fields per Household	Average Area of Land Under Cultivation (in hectares)	
		1996-7 Rainy Season*	1997 Dry Season**
Marromeu	2.5	2.03	0.08
Female-headed households	2.4	1.48	0.09
Male-headed households	2.5	2.07	0.08
Nhamatanda	1.8	2.10	0.05
Female-headed households	1.6	1.59	0.02
Male-headed households	1.8	2.20	0.06
Both Districts	2.1	2.07	0.07
Female-headed households	1.8	1.56	0.04
Male-headed households	2.2	2.13	0.07

(*) Data for the 1996-7 rainy season includes the area planted to maize, sorghum, rice, cowpea, pigeon pea, common bean, groundnut, millet, cassava, sunflower and sesame.

(**) Data for the 1997 dry season includes the area planted to onion, kale, cabbage, tomato, garlic, sweet potato, squash, lettuce, carrot, green pepper and chili pepper.

Although there was little difference in the average area of land under cultivation per household during the principal cropping season between the two districts, there was considerable variation in the area planted between farmers. One female-headed household in Marromeu did not plant anything during the 1996-7 rainy season. Among the other interviewees in both districts, the total area planted ranged from a minimum of 0.02 hectares to a maximum of 13.5 hectares. Large landholdings were rare, with only 17 of the 600 households surveyed planting more than five hectares during the 1996-7 rainy season.

2.3.2 Major Food and Oilseed Crop Production

Crop diversity is an important strategy for minimizing farmers' risk of yield loss from drought, flood, and pest attacks. FHI/M encourages farmers to diversify their cropping systems as a way of increasing their food security. During the survey, interviewees were asked what crops they had grown during the 1996-7 growing season, the area planted to each crop, the production harvested of each crop, and whether they practiced mono-cropping or inter-cropping. Data concerning the percentage of households that grew or sold any major food or oilseed crop are presented in Table 26, together with the average number of major food/oilseed crops grown or sold. Households in Marromeu grew an average of 4.2 crops during the 1996-7 growing season, while those in Nhamatanda grew a more limited range of crops (2.9 crops per household). Farmers in Marromeu tend to grow a complete range of crops for home consumption and only buy essential food supplies in times of shortage. Farmers in

Nhamatanda, on the other hand, concentrate more on the production of commercially important crops, using the income generated through crop sales to purchase food items which they did not produce themselves. Crop diversification has been encouraged by FHI/M extension programs operating in both districts.

Crop production during the 1996-7 growing season was severely limited by widespread floods and the percentage of households with surplus production for sale was low. Table 26 shows that around one-quarter of the households surveyed sold a portion of their produce, with little difference between districts. On average, 1.2 crops were sold per household.

Table 26 Percentage of households that grew or sold any type of major food/oilseed crop following the 1996-7 season's harvest, as a percentage of total households, and the average number of major food/oilseed crops grown or sold, by district

District	Households that Grew or Sold any Major Food/Oilseed Crop (% of total households)		Average Number of Major Food/Oilseed Crops Grown or Sold (among households that grew these crops*)	
	Grew	Sold	Grown	Sold
Marromeu	100	27	4.2	1.1
Nhamatanda	100	26	2.9	1.2
Both Districts	100	27	3.6	1.2

(*) Households growing major food/oilseed crops represent those families growing one or more of the following crops: maize, sorghum, rice, cowpea, pigeon pea, common bean, groundnut, millet, cassava, sweet potato, sunflower or sesame.

The percentage of households that planted individual crops is presented in Table 27. During the 1996-7 growing season, maize was by far the most important crop in both districts, being planted by 96% of families in Marromeu and by all families in Nhamatanda. In Marromeu, a more diverse range of crops were grown, with sorghum, rice, and millet (rainy season) and sweet potato (dry season) being planted by over 60% of the interviewees. In Nhamatanda, on the other hand, maize was clearly the primary crop, with sorghum, cowpea and sweet potato being planted by approximately 40% of the households. Some clear distinctions can be made between districts. Marromeu, located on the delta of the river Zambezi, is an important rice growing area, with rice being grown by two-thirds of the households surveyed. Rice, however, is of limited importance in Nhamatanda. The proportion of households growing rice during the 1996-7 growing season is exceptionally high compared with earlier surveys, and is probably a result of the heavy rains which encouraged more farmers to plant rice. Cowpea is grown more extensively in Nhamatanda than in Marromeu, probably as an inter-crop with maize (see also Section 2.3.10, Table 76). Groundnut production is largely limited to Nhamatanda (17% of households), where the soils are well drained. Sweet potato is an important dry season crop in both districts, although the heavier soils of Marromeu, having a higher dry season moisture content, are particularly suitable for sweet potato production. Cassava was much more important in Marromeu than in Nhamatanda. Among the oilseed crops, groundnut, sesame and sunflower production were largely limited to Nhamatanda, with 17% of the households growing groundnut, 10% growing sesame and one family growing sunflower.

The percentage of households selling a particular crop is an indication of the extent to which production during a particular growing season was surplus to household consumption needs (see Table 28). As discussed earlier, the percentage of households selling agricultural produce was very limited following the 1996-7 growing season. The principal crop offered for sale was maize, with approximately one-quarter of the households surveyed selling maize. All other crops were sold by less than 3% of the surveyed households, sales of sorghum and rice being more common in Marromeu and sales of cowpea and sweet potato being more common in Nhamatanda. The sale of oilseed crops was limited to groundnut and sesame by 1.0% or less of the households surveyed in Nhamatanda.

Table 27 Percentage of households that grew major food and oilseed crops in the 1996-7 growing season, by district

Households that Grew Major Food and Oilseed Crops in the 1996-7 Growing Season (% of total households)												
District	Maize	Sorghum	Rice	Cowpea	Pigeon Pea	Common Bean	Groundnut	Millet	Cassava	Sweet Potato	Sunflower	Sesame
Marromeu	96	65	64	19	13	2	2	60	30	67	0	3
Nhamatanda	100	46	13	44	7	1	17	7	6	39	0&	10
Both Districts	98	55	38	31	10	1	10	33	18	53	0&	6

(&) One family in Nhamatanda planted sunflower

Table 28 Percentage of households that sold* major food and oilseed crops following the 1996-7 season's harvest, by district

Households that Sold Major Food and Oilseed Crops* (% of total households)												
District	Maize	Sorghum	Rice	Cowpea	Pigeon Pea**	Common Bean	Groundnut	Millet	Cassava**	Sweet Potato**	Sunflower	Sesame
Marromeu	24.3	2.0	3.0	0.0	0.0	0.0	0.0	1.0	0.3	0.0	-	0.0
Nhamatanda	22.3	1.3	0.3	3.0	0.3	0.3	0.7	0.0	1.0	1.7	0.0	1.0
Both Districts	23.3	1.7	1.7	1.5	0.2	0.3	0.3	0.3	0.7	0.8	0.0	0.5

(*) Only those households that provided complete quantity and price data are considered to have sold produce

(**) At the time of the survey, the majority of the pigeon pea, cassava and sweet potato crops were still in the field

Table 29 presents the average land area under cultivation to the individual crops. In cases where two crops were inter-cropped, the proportion of the total area planted to each crop was estimated to determine the area planted to each component of the inter-crop. This method of expressing land area planted to inter-crop components is considered to be more realistic and differs from previous FHI/M reports. The largest areas in both districts were planted to maize, the principal staple crop. However, the area planted to maize in Nhamatanda was considerably larger (1.41 hectares) than that planted to maize in Marromeu (0.86 hectares), probably because it is relatively easy to sell surplus produce in Nhamatanda. Sorghum and rice are also staple crops, with households planting these crops dedicating over 0.5 hectares to each crop in both districts surveyed. The area planted to cowpea, common bean, millet, cassava and sweet potato was similar in the both districts. Farmers planting pigeon pea in Nhamatanda tended to plant a larger area (0.2 hectares) than their counterparts in Marromeu (0.1 hectares).

Inter-cropping (growing more than one crop together in the same field) is a common traditional practice among farmers in the target districts. Although there are a number of advantages to inter-cropping (especially cereal-legume inter-crops), including minimizing pest attacks and increasing soil nitrogen (when legumes are included), an important disadvantage is the tendency to plant using extremely low plant populations, resulting in greatly decreased yields. The use of monoculture with rotation or strip inter-cropping is recommended by FHI/M.

For each crop grown, surveyors asked the interviewees whether they used mono-cropping or inter-cropping systems. Table 30 shows the percentage of households inter-cropping major food and oilseed crops, and the average number of crops inter-cropped per household. In all crops with the exception of sesame, inter-cropping was practiced by a larger proportion of interviewees in Nhamatanda than in Marromeu, with farmers inter-cropping an average of 1.6 crops per household compared with 1.3 crops per household in Marromeu. As farmers in Nhamatanda grow fewer crops on average than in Marromeu, the implication is that farmers in Nhamatanda rely principally on an inter-cropping based cropping system, whereas a proportion of farmers in Marromeu tend to implement a more specialized cropping system which varies according to the crop.

In the target districts, the staple cereal crops, maize, sorghum and millet are frequently inter-cropped, probably in cereal-cereal or cereal-legume combinations (see also Section 2.3.10). Indeed, in both districts, the majority (89%) of households growing cowpea planted it in combination with a second crop, and an average of 70% of households growing pigeon pea inter-cropped it with a second crop. Rainfed lowland rice is normally planted as a monoculture. In Nhamatanda, however, 18% of households inter-cropped rice with a second crop (normally maize), a practice used in the low-lying, more marginal maize producing areas. Among the oilseed crops, groundnut and sesame were both inter-cropped by around one-half of the households growing these crops. Sunflower, on the other hand, was grown as a monoculture.

Table 31 summarizes some of the information obtained regarding the oilseed crops (groundnut, sunflower and sesame). The percentage of households planting any type of oilseed crop ranged from 4% in Marromeu where farmers grow an average of 1.1 oilseed crops, to 23% in Nhamatanda where an average of 1.2 oilseed crops are grown. Among households growing oilseed crops, sesame was the most commonly grown oilseed in Marromeu, whereas groundnut was more common in Nhamatanda. FHI/M is trying to build on the popularity of sesame in Marromeu by introducing varieties with a higher quality oil content. Farmers planting oilseeds appear to dedicate a similar total area to oilseed crops, regardless of the number of oilseed crops grown. However, variation in field size was evident, particularly for sesame, where the area planted ranged from 0.003 hectares to 3 hectares. The area planted tends to reflect the degree of the farmers' commercial interest in the crop, with larger areas being planted by farmers who intend to sell their produce. Most sesame producers appear to be growing small areas for their own use.

Table 29 Average land area under cultivation in hectares, by crop and district, among households that grew each crop in the 1996-7 season

District	Average Land Area Under Cultivation by Crop in Hectares (among households that grew each crop and reported the area cultivated)											
	Maize	Sorghum	Rice	Cowpea	Pigeon Pea	Common Bean	Groundnut	Millet	Cassava	Sweet Potato	Sunflower	Sesame
Marromeu	0.86	0.62	0.54	0.47	0.10	0.25*	0.25*	0.45	0.25	0.11	-	0.50*
Nhamatanda	1.41	0.67	0.52	0.40	0.20	0.26*	0.36	0.38	0.24*	0.07	0.05*	0.39
Both Districts	1.14	0.64	0.53	0.42	0.13	0.25*	0.35	0.44	0.25	0.09	0.05*	0.42

(*) These averages are based on less than 20 observations

Table 30 Percentage of farmers inter-cropping major food and oilseed crops and the average number of crops grown and inter-cropped per household, by district

District	Households Inter-cropping Major Food and Oilseed Crops (among households that grew each crop and provided inter-cropping information)											Average Number of Crops ** (per household)	
	Maize	Sorghum	Rice	Cowpea	Pigeon Pea	Common Bean	Groundnut	Millet	Cassava	Sunflower	Sesame	Inter-cropped	Total
Marromeu	49	44	5	89	63	33*	50*	33	36	-	71*	1.3	4.2
Nhamatanda	66	79	18	89	81	50*	53	42*	50*	0*	46	1.6	2.9
Both Districts	57	59	7	89	70	38*	53	34	38	0*	52	1.5	3.6

(*) These percentages are based on less than 20 observations

(**) The average number of crops grown is calculated on the basis of the following crops: maize, sorghum, rice, cowpea, pigeon pea, common bean, groundnut, millet, cassava, sweet potato, sunflower and sesame. The average number of crops inter-cropped was calculated on the basis of all of the above-mentioned crops, with the exception of sweet potato for which inter-cropping data was not collected.

Table 31 Percentage and absolute number of households that planted oilseed crops (groundnut, sunflower or sesame) during the 1996-7 growing season, the average number of oilseed crops grown by oilseed-producing households and the average land area planted to oilseed crops, by district

District	Households Planting Any Oilseed Crop (% of total and absolute number)		Average Number of Oilseed Crops Planted (among oilseed-producing households)	Households Planting Oilseed Crops (% of oilseed-producing households)						Average Area Planted to Oilseed Crops in Hectares (among oilseed-producing households)		
	%	#		Groundnut		Sunflower		Sesame		%	#	
			%	#	%	#	%	#	%	#		
Marromeu	4	13	1	1	46	6	0	0	62	8	0.45	13
Nhamatanda	23	70	1	2	74	52	1	1	43	30	0.43	70
Both Districts	14	83	1	2	70	58	1	1	46	38	0.43	83

By the time of data collection (August 18 to 29), harvest of the major cereal and legume crops grown during the 1996-7 rainy season was largely complete. However, 14 of the 60 households growing pigeon pea (primarily in Marromeu) and 38 of the 110 households growing cassava (all in Marromeu) had not yet harvested their crops. Sweet potato is also considered a staple food crop. However, as this crop is planted in the dry season, the majority of households that had planted sweet potato (226 out of 318 households) were not able to provide yield data, as their crops were still in the field.

The interviewees were asked to provide information on the quantity of each crop produced at harvest. A pre-survey study revealed that common harvest units for the major food and oilseed crops were the kilogram, 50kg or 90 kg sacks, 20 liter cans, jerry cans, the "Serilac" tin, and a bowl. Interviewees therefore selected the most appropriate harvest unit and stated the number of units they had harvested. The capacity of each harvest unit was determined for each crop (for details see Appendix 1) and this data was used to calculate the amount of produce harvested and sold by each household, on a crop-by-crop basis. Household production in terms of the number of kilograms produced and sold per household, the value of the produce sold and the number of month's food supply will be discussed in Section 2.3.3. Tables 32 to 37 present the percentage of households reporting total crop loss and the farmer-reported harvest data in terms of the yield (tons per hectare) of each crop, with the data from two crops presented in each table. Crop yield in tons per hectare was calculated on a household-to-household basis for each crop individually, by dividing the number of kilograms harvested of a particular crop by the area planted to that crop. The average farmer-reported yield per hectare is presented in four ways, detailed below:

- yield per hectare among all households that grew each crop, i.e. including those households having complete crop failures and widespread crop losses,
- yield per hectare among households that reported production under "normal" conditions, i.e. excluding households reporting complete crop failure (farmer-reported production of 0 kg) and excluding those reporting in-field crop losses of over 75%.
- yield per hectare of mono-cropped fields among households that reported "normal" production.
- yield per hectare of inter-cropped fields among households reporting "normal" production.

It is well known that farmers in Mozambique tend to underestimate their agricultural production during surveys such as this. This is probably a legacy of the period immediately prior to and following the signing of the Peace Accord, when food, seed and tools were provided free-of-charge as part of a nationwide emergency relief program. FHI/M feels that the farmer-estimated yield data presented in Tables 32 to 37 are an underestimate of the actual yields obtained by farmers in the target districts. To complement farmer-estimated yield data such as that obtained from this survey, and as part of their ongoing project monitoring and evaluation activities, FHI/M extensionists also make

annual physical measurements of the yields of selected crops. Data from physical yield measurements are not included in this report.

Complete failure of the maize crop was reported by 23% of farmers in Marromeu, largely because of flooding, and only by 4% of farmers in Nhamatanda (Table 32). The higher frequency of crop loss in Marromeu resulted in lower overall maize yields (0.40 t/ha) than those obtained in Nhamatanda (0.54 t/ha). When cases of complete crop failure and in-field crop losses of 75% or more were excluded, maize yields were slightly higher in Nhamatanda than in Marromeu. The overall maize yields in Nhamatanda appear to have been boosted by the higher yields obtained by inter-cropped maize plantings. In general, yields from inter-cropped plantings were between 160 and 230 kg/ha higher than those obtained from mono-cropped plantings following the 1996-7 growing season.

Total crop failure occurred in between one-fifth and one-tenth of the households growing rice during the 1996-7 growing season. Again the higher frequency of crop loss in Marromeu reduced the overall yield per hectare obtained by rice growers in that district. Those households experiencing "normal" rice production obtained an average yield of 1.39 t/ha, with little difference between districts. As expected, mono-cropped rice planting produced higher overall yields than inter-cropped plantings.

Sorghum and millet crops suffered badly during the 1996-7 growing season, with almost one-third of the households that had planted these crops suffering complete crop loss (Table 33). The average yields of sorghum and millet were higher in Marromeu than in Nhamatanda, due to higher crop losses in Nhamatanda. When the yields of those households experiencing "normal" production are considered, overall yields of 0.37 t/ha of sorghum and 0.49 t/ha of millet were produced. In both cases, however, yields tended to be higher in Marromeu than in Nhamatanda, reflecting the fact that the soils in Marromeu tend to be more fertile than soils in Nhamatanda. When averaged across districts, inter-cropping had no effect on sorghum yields, while mono-cropped millet plantings yielded more than inter-cropped plantings.

One-quarter of households in Nhamatanda and one-third of households in Marromeu lost their cowpea crops (Table 34). Under "normal" production conditions, cowpea yields were twice as high in Nhamatanda (0.38 t/ha) than in Marromeu (0.19 t/ha). Although most farmers inter-crop their cowpea, the higher yields obtained in Nhamatanda reflect the fact that a limited number of families in Nhamatanda planted cowpea as a single crop, probably for commercial purposes, and obtained yields eight times higher than those obtained by inter-cropped plantings in the same district. Pigeon pea crop losses ranged from 15% of households planting pigeon pea in Marromeu to more than one-half of the households planting pigeon pea in Nhamatanda. The extensive crop losses experienced by farmers in Nhamatanda reduced the overall pigeon pea yield in that district to almost one-quarter of that obtained by farmers in Marromeu. Under "normal" production conditions, households in Marromeu and Nhamatanda obtained average yields of 1.81 t/ha and 1.09 t/ha, respectively. In Marromeu, mono-cropping produced considerably higher yields than inter-cropping, while in Nhamatanda the reverse was the case.

Table 35 presents the yields of common bean and groundnut. Crop loss of common bean was widespread, with one-third of households in Marromeu and one-half of households in Nhamatanda losing their bean crops. Yields, on the other hand, tended to be higher in Nhamatanda than in Marromeu. Groundnut producers experienced less crop loss, with only two-fifths of the households surveyed suffering complete crop failure. This is probably because groundnut tends to be planted in well-drained soils that are consequently less susceptible to flooding. Groundnut yields tended to be higher in Marromeu than in Nhamatanda, particularly from inter-cropped plantings, although more farmers grew groundnuts in Nhamatanda.

Table 32 Farmer-reported maize and rice yield estimates for the 1996-7 growing season, by district

District	% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Maize Average Yield in Tons/Hectare (among households that reported "normal" production)			% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Rice Average Yield in Tons/Hectare (among households that reported "normal" production)		
			Mono-cropped	Inter-cropped	Both			Mono-cropped	Inter-cropped	Both
Marromeu	23	0.40	0.57	0.73	0.65	19	0.98	1.19	1.56*	1.36
Nhamatanda	4	0.54	0.57	0.80	0.71	8	1.50	1.91*	0.60*	1.53
Both Districts	14	0.47	0.57	0.77	0.69	17	1.07	1.28	1.03*	1.39

(*) These averages are based on less than 20 observations

Table 33 Farmer-reported sorghum and millet yield estimates for the 1996-7 growing season, by district

District	% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Sorghum Average Yield in Tons/Hectare (among households that reported "normal" production)			% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Millet Average Yield in Tons/Hectare (among households that reported "normal" production)		
			Mono-cropped	Inter-cropped	Both			Mono-cropped	Inter-cropped	Both
Marromeu	26	0.24	0.37	0.42	0.39	18	0.35	0.54	0.43	0.50
Nhamatanda	33	0.18	0.41*	0.30	0.33	35	0.19*	0.25*	0.44*	0.28*
Both Districts	29	0.22	0.38	0.37	0.37	20	0.33	0.52	0.43	0.49

(*) These averages are based on less than 20 observations

Table 34 Farmer-reported cowpea and pigeon pea yield estimates for the 1996-7 growing season, by district

District	% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Cowpea Average Yield in Tons/Hectare (among households that reported "normal" production)			% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Pigeon Pea Average Yield in Tons/Hectare (among households that reported "normal" production)		
			Mono-cropped	Inter-cropped	Both			Mono-cropped	Inter-cropped	Both
Marromeu	34	0 10	0 01*	0 21	0 19	15	1 19	4 33*	0 53*	1 81*
Nhamatanda	23	0 24	1 54*	0 19	0 38	57	0 33	0 18*	1 27*	1 09*
Both Districts	27	0 20	1 28*	0 20	0 33	30	0 79	3 64*	0 79*	1 60

(*) These averages are based on less than 20 observations

Table 35 Farmer-reported common bean and groundnut yield estimates for the 1996-7 growing season, by district

District	% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Common Bean Average Yield in Tons/Hectare (among households that reported "normal" production)			% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Groundnut Average Yield in Tons/Hectare (among households that reported "normal" production)		
			Mono-cropped	Inter-cropped	Both			Mono-cropped	Inter-cropped	Both
Marromeu	33*	0 11*	0 40*	0 03*	0 21*	17*	1 04*	0 24*	2 83*	1 54*
Nhamatanda	50*	2 50*	-	5 00*	5 00*	21	0 19	0 24	0 30*	0 27
Both Districts	38*	0 90*	0 40*	2 51*	1 81*	21	0 28	0 24	0 64*	0 40

(*) These averages are based on less than 20 observations

The sunflower producer in Nhamatanda did not experience any crop losses and obtained an average of 1.51 t/ha from his mono-cropped plantings (Table 36). Sesame crop losses occurred in 13% and 27% of sesame producing households in Marromeu and Nhamatanda, respectively. The average sesame yield was considerably lower in Nhamatanda (0.14 t/ha) than in Marromeu (1.51 t/ha), even under "normal" production conditions (0.20 and 2.38 t/ha, respectively).

One-third of cassava producers suffered total crop losses, with average yields of 0.69 t/ha and 1.89 t/ha being produced in Marromeu and Nhamatanda, respectively (Table 37). Under "normal" growing conditions, cassava yields were two to three times higher, with averages of 1.96 t/ha and 3.10 t/ha being produced in the two districts, respectively. In Marromeu, inter-cropped plantings proved considerably more productive than mono-cropped plantings, whereas the reverse was the case in Nhamatanda. Sweet potato producers in Nhamatanda suffered similar crop losses, while only 6% of producers in Marromeu lost their crops. Yields obtained by farmers who produced sweet potato under "normal" growing conditions were two to three times higher than the overall district averages, with farmers in Marromeu producing an average of 1.28 t/ha and farmers in Nhamatanda an average of 6.40 t/ha. It should be noted that, in the case of three households, the yield per hectare data calculated using the information provided by the interviewee (quantity harvested and area planted to sweet potato) were unrealistically high. These households were therefore excluded from the analysis.

2.3.3 Food Security Situation

The average production of the individual food and oilseed crops per household following the 1996-7 growing season is presented in Table 38, among households reporting any production. Cases of complete crop failure (farmer-reported production of 0 kilograms) were excluded. Reported maize production was variable between districts, with households in Marromeu producing approximately one-half (278 kg) the production of households in Nhamatanda (557 kg). Rice was the second most productive staple crop, with households in Marromeu and Nhamatanda producing an average of 256 kg and 379 kg, respectively. Sorghum and millet production in Marromeu was one-half and one-third of that of maize, respectively, while sorghum and millet production in Nhamatanda represent one-quarter and one-sixth of that of maize in the same district, respectively.

The average volume and value of produce sold by households reporting production are presented in Tables 39 and Table 40, respectively. The average quantities of produce sold were very limited. Households in Nhamatanda sold the largest quantities of all crops, with the exception of cassava, which was produced and sold principally in Marromeu. Cowpea, common bean, groundnut, and sesame appear to be grown principally for sale, with the majority of the produce being sold. Sorghum and cassava are also of important commercial value, as over three-quarters of the average sorghum production and one-half of the average cassava production was sold. The remaining crops (sweet potato, rice, maize, pigeon pea and millet) were used principally for consumption, with up to one-quarter of the average production being sold. In Marromeu, on the other hand, most produce was used for home consumption. Crop sales were restricted to between one-fifth and one-quarter of the maize and rice production, almost one-half of the sorghum production and the majority of the cassava production. Table 40 shows that pigeon pea, common bean and sweet potato can make a useful contribution to household income, even when small quantities of produce are sold, as these represent relatively high value crops (particularly pigeon pea and bean). In the case of the other crops, including maize and cassava, their value per kilogram is relatively low and their contribution to household income depends on the volume sold.

The household production of individual crops was used to calculate the number of months' food supply available to each household following the 1996-7 season's harvest. For each household, the production of maize, sorghum, rice and millet was summed to determine the total household grain production. Likewise, the total household production of roots crops was calculated by summing the production of cassava and sweet potato, and the total household production of legumes/oilseeds was calculated by summing the production of cowpea, pigeon pea, common bean, groundnut, sunflower and sesame. In turn, the total household production of the staple crops was calculated by summing the

Table 36 Farmer-reported sunflower and sesame yield estimates for the 1996-7 growing season, by district

District	% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Sunflower Average Yield in Tons/Hectare (among households that reported "normal" production)			% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Sesame Average Yield in Tons/Hectare (among households that reported "normal" production)		
			Mono-cropped	Inter-cropped	Both			Mono-cropped	Inter-cropped	Both
Marromeu	-	-	-	-	-	13	1.51*	0.04*	2.99*	2.38*
Nhamatanda	0*	1.51*	1.51*	-	1.51*	27	0.14	0.32*	0.08*	0.20*
Both Districts	0*	1.51*	1.51*	-	1.51*	24	0.43	0.30*	1.05*	0.66

(*) These averages are based on less than 20 observations

Table 37 Farmer-reported cassava and sweet potato yield estimates for the 1996-7 growing season, by district

District	% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Cassava Average Yield in Tons/Hectare (among households that reported "normal" production)			% households reporting yield = 0	Average Yield in T/Ha (among all producers)	Sweet Potato** Average Yield in Tons/Hectare (among households reporting production > 0kg)		
			Mono-cropped	Inter-cropped	Both			Mono-cropped	Inter-cropped	Both
Marromeu	31	0.69	1.36*	3.89*	1.96*	6	0.38*	-	-	1.28*
Nhamatanda	37*	1.89*	5.26*	1.39*	3.10*	33	2.97	-	-	6.40
Both Districts	32	1.00	2.45*	2.50*	2.40	16	2.47	-	-	5.72

(*) These averages are based on less than 20 observations

(**) The data concerning quantity of produce harvested and the area planted provided by three farmers, one in Marromeu and two in Nhamatanda, gave yields per hectare which were unrealistically high, these data were omitted from the analysis. Data concerning the extent of in-field crop losses was not available for sweet potato and therefore the yield data represents the average yield obtained by those households that produced yields greater than 0 kg

Table 38 Average food/oilseed crop production per household, among households that grew each crop in the 1996-7 growing season and reported any production, by district

District	Average Food/Oilseed Crop Production per Household in Kilograms (among households that grew each crop and reported production of >0kg)											
	Maize	Sorghum	Rice	Cowpea	Pigeon Pea	Common Bean	Groundnut	Millet	Cassava	Sweet Potato	Sunflower	Sesame
Marromeu	278	138	256	39	64*	53*	424*	107	135	106*	-	32*
Nhamatanda	557	125	379	33	67*	50*	54	81*	115*	190	76*	44
Both Districts	436	133	278	35	65	52*	94	105	128	178	76*	41

(*) These averages are based on less than 20 observations

Table 39 Average volume of food/oilseed produce sold per household, among households that grew each crop in the 1996-7 growing season and reported income from that source, by district

District	Average Volume of Food/Oilseed Produce Sold per Household * (among households that grew each crop and reported income from that source)											
	Maize	Sorghum	Rice	Cowpea	Pigeon Pea**	Common Bean	Groundnut	Millet	Cassava**	Sweet Potato**	Sunflower	Sesame
Marromeu	74	64	45	0	0	0	0	13	150	0	-	0
Nhamatanda	184	108	90	45	18	50	45	0	58	39	0	43
Both Districts	127	82	50	45	18	25	45	13	81	39	0	43

(*) Only those households that provided complete quantity and price data are considered to have sold produce. All averages, with the exception of the volumes of maize sold, are based on less than 20 observations

(**) At the time of the survey, the majority of the pigeon pea, cassava and sweet potato crops were still in the field

Table 40 Average value of food/oilseed produce sold per household, among households that grew each crop in the 1996-7 growing season and reported income from that source, by district

District	Average Value of Food/Oilseed Produce Sold per Household in U S \$* (among households that grew each crop and reported income from that source)											
	Maize	Sorghum	Rice	Cowpea	Pigeon Pea**	Common Bean	Groundnut	Millet	Cassava**	Sweet Potato**	Sunflower	Sesame
Marromeu	5 23	6 38	5 40	0 00	0 00	38 72	0 00	1 59	7 92	0 00	-	0 00
Nhamatanda	15 67	8 05	13 20	6 93	16 19	10 56	4 58	0 00	10 12	33 99	0 00	5 37
Both Districts	10 23	7 05	6 18	6 93	16 19	24 64	4 58	1 59	9 57	33 99	0 00	5 37

(*) Only those households that provided complete quantity and price data are considered to have sold produce. All averages, with the exception of the volumes of maize sold, are based on less than 20 observations.

(**) At the time of the survey, the majority of the pigeon pea, cassava and sweet potato crops were still in the field.

Table 41 Average number of month's supply of staples (grains and roots) and legumes, among households surveyed, by district

District	Average Number of Months Supply (among total households)	Proportion of Households Belonging to Different Food Supply Categories (% of total households)				
		0 to 2 9 months	3 0 to 5 9 months	6 0 to 8 9 months	9 0 to 11 9 months	12 months or more
Marromeu						
Staple crops	7 3	32	27	14	10	17
Grains	7 0	32	28	14	9	17
Roots	0 3	97	2	0	0	1
Legumes	0 8	95	3	0	0	2
Nhamatanda						
Staple crops	9 0	25	29	15	9	22
Grains	8 5	27	29	15	7	22
Roots	0 5	98	1	0	1	0
Legumes	1 9	85	7	3	2	3
Both Districts						
Staple crops	8 1	32	28	14	7	19
Grains	7 8	33	28	15	6	18
Roots	0 4	98	2	0	0	0
Legumes	1 4	90	5	1	1	3

total production of grains and roots. During relief operations, international agencies including the World Food Program commonly provide 13.5kg of maize and 3kg of beans as a basic ration per person per month. The figure of 13.5kg per person per month was used as the basis for the calculation of the number of months supply of grains, roots and staples (grains plus roots) available to each household. Likewise, the figure of 3kg per person per month was used to calculate the number of months supply of legumes/oilseeds available to each household. To calculate the number of months supply of grains of a particular household, the total household production of grains was divided by the number of family members, the product of which was divided again by 13.5. The average number of months supply of staples (grains and roots) and legumes/oilseeds is presented in Table 41. It should be remembered that these estimates are based on farmer-estimated harvest data and therefore the actual food security situation is likely to be more positive than these results indicate.

The farmer-estimated harvest data indicate that the food security situation is slightly poorer in Marrómeu than it is in Nhamatanda. One-third of the households in Marrómeu have less than three months supply of the staple crops (grains plus roots), while one-quarter of the households in Nhamatanda have less than three months supply. In Nhamatanda, one community, Muda, has a particularly poor food security situation, with 50% of the households surveyed having less than three months supply of staples. Three communities in Marrómeu, K. Kaunda, Chueza and Cundue have food security problems, with 42%, 43% and 68% of the households surveyed in these communities, respectively, having less than three months supply of staples. In both districts, around 28% of households have between three and six months supply of staples and 14 to 15% have between six and nine months supply. The majority of households have less than one month's supply of roots. Households in Marrómeu have an average of 0.8 months supply of legumes while those in Nhamatanda have an average of 1.9 months supply of legumes.

2.3.4 Crop Production Constraints

Interviewees were asked whether the 1996-7 season's production of each crop was less than, the same as or greater than the 1995-6 season's production of the same crop. The percentage of households who considered that the 1996-7 season's production was less than or greater than the 1995-6 season's production are presented in Table 42. Farmers who lost their 1996-7 season's crop and therefore responded "I did not harvest anything" were included in the "1996-7 less than 1995-6" category. These results demonstrate that the 1996-7 season's production of all crops was clearly lower than that of the previous year, with the exception of rice where at least one-fifth of rice producers in each district felt that the 1996-7 season's rice production was higher than that of the previous year. These observations reflect the fact that heavy rains and floods caused considerable damage to plant stands and crop yield of most crops, with the exception of rice which, in some areas, benefited from the excess moisture.

The yield data presented in the Section 2.3.2, together with farmers comments concerning the 1996-7 season's crop production, demonstrate that the 1996-7 growing season was severely hampered by production constraints. Interviewees were asked to estimate the extent of in-field losses that each crop had suffered. To assist farmers in their loss estimates they were given the following options: no loss, a little or less than 25%, approximately 25%, half, approximately 75%, between 75% and everything, and everything. Table 43 presents the percentage of households that suffered in-field losses in each crop individually and the percentage of households that suffered in-field losses to any crop. Table 44 shows the percentage of households that lost less than 25% of their crop or that lost more than 75% of their crop.

Almost all households surveyed suffered in-field crop losses to one or more crops. When each crop is examined individually, it is clear that in-field losses were experienced in all crops, with the apparent exception of sunflower, which was only grown by one family in Nhamatanda. However, the extent of these losses varies between households and between crops (see Table 44). In the case of maize, 90% or more of the households that experienced crop losses, lost 25% or more of their crop, with one-third to one-half of farmers losing more than 75% of their crop. These are serious in-field losses.

Table 42 Percentage of households who considered that the 1996-7 season's production of individual crops was less than* or greater than that of the 1995-6 season's production (as estimated by farmers), as a percentage of households that grew each crop, by crop and district

Success of the 1996-7 Season's Production Relative to the 1995-6 Season's Production (% of households that grew each crop)												
District	Maize		Sorghum		Rice		Cowpea		Pigeon Pea		Common Bean	
	1996-7 Less than 1995-6	1996-7 Greater than 1995-6										
Marromeu	85	8	85	4	65	21	79	5	46	0	67**	0**
Nhamatanda	86	7	88	4	55	26	83	9	86	0	100**	0**
Both Districts	86	8	86	4	64	22	81	8	60	0	75**	0**

Success of the 1996-7 Season's Production Relative to the 1995-6 Season's Production (% of households that grew each crop)										
District	Groundnut		Millet		Cassava		Sunflower		Sesame	
	1996-7 Less than 1995-6	1996-7 Greater than 1995-6								
Marromeu	50**	33**	77	7	45	5	-	-	88	13
Nhamatanda	83	6	85	0	74	11	0	0	93	7
Both Districts	79	9	77	6	50	6	0	0	92	8

(*) Farmers who lost their crop during the 1996-7 growing season were included in the "1996-7 Less than 1995-6" category, together with those farmers who specifically stated that the 1996-7 season's production was less than that of the 1995-6 season

(**) These percentages are based on less than 20 observations

Table 43 Percentage of households citing in-field crop losses, as a percentage of households that grew each crop, by crop and district

District	Households Citing In-Field Crop Losses (% of households that grew each crop)											
	Maize	Sorghum	Rice	Cowpea	Pigeon Pea	Common Bean	Groundnut	Millet	Cassava	Sunflower	Sesame	Any Crop
Marromeu	93	93	87	88	59	67*	83*	87	49	-	88	98
Nhamatanda	91	90	74	89	95	100*	87	85	74*	0*	93	95
Both Districts	92	92	85	88	72	75	86	87	54	0*	92	96

(*) These percentages are based on less than 20 observations

Table 44 Percentage of households citing in-field crop losses of less than 25% or of more than 75% (as estimated by farmers), as a percentage of households that grew each crop, by crop and district

District	Households Citing In-Field Crop Losses (% of households that grew each crop and suffered crop losses)											
	Maize		Sorghum		Rice		Cowpea		Pigeon Pea		Common Bean	
	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%
Marromeu	10	48	12	49	24	38	4	53	17	35	0*	50*
Nhamatanda	9	38	5	67	32	43	8	48	0	70	50*	50*
Both Districts	10	43	9	56	25	39	7	50	9	51	17	50

District	Households Citing In-Field Crop Losses (% of households that grew each crop and suffered crop losses)									
	Groundnut		Millet		Cassava		Sunflower		Sesame	
	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%
Marromeu	20*	40*	12	45	13	71	-	-	29*	43*
Nhamatanda	11	38	0*	71*	0*	50*	0*	0*	18	39
Both Districts	12	38	11	47	10	66	0*	0*	20	40

(*) These percentages are based on less than 20 observations

A similar situation was experienced with sorghum, millet, cowpea, pigeon pea, common bean, groundnut and cassava. In the case of rice, around 70% of households that suffered crop losses lost 25% or more of their crop. In-field losses of sesame were slightly less than those of rice.

To develop and promote interventions to improve crop yields it is necessary to understand the factors that limit yield. Farmers were asked what type of in-field production constraints they encountered and the responses are given in Table 45, as the percentage of households suffering each production constraint. Please note these responses are not crop-specific.

Table 45 In-field production constraints identified by farmers, as a percentage of total households, by district

Cause of In-Field Production Losses	Households Citing Production Constraint, by District (% of total households)		
	Marromeu	Nhamatanda	Both Districts
Any production constraint	99*	100	100*
Excessive Rain/Flooded Fields	90	89	89
Rodents	43	51	47
Strong Winds/Lodging	10	47	29
Birds	24	13	19
Insects	12	5	9
Termites	7	7	7
Locusts	6	7	7
Stalk Borer	9	4	6
Weeds	3	6	5
Monkeys	4	3	4
Drought	6	0	3
Theft from the Field	1	5	3
Diseases	3	3	3
Wild Pigs	1	0&	1
Guinea Fowl	0	1	1
Poor Soil	0&	0&	1
Insufficient Seeds	0&	0	0&
Loss during Land Burning	0&	1	1

(*) Three families in Marromeu did not experience any production problems

(&) Four families in Marromeu and two families in Nhamatanda cited wild pigs as a production constraint. One family in Marromeu cited insufficient seeds as a production problem. One family in Marromeu and two families in Nhamatanda said that poor soil was a production constraint. One family in Marromeu and four families in Nhamatanda said that crop loss during burning was a problem.

All households surveyed suffered one or more production constraint, with the exception of three families in Marromeu. The most common production constraint, reflecting the problems encountered during the 1996-7 growing season, was excessive rain and flooded fields, experienced by 89% of households surveyed. These heavy rains and floods were the principal cause of in-field crop losses cited in Tables 43 and 44. Rodents were also a common problem, cited by almost one-half of the households surveyed. Field mice cause problems during seed germination and early plant development by eating the seeds and seedlings. They will also eat the leaves and young cobs. Strong winds resulting in lodging was a problem, particularly in Nhamatanda (cited by 47% of households surveyed) and birds were mentioned as a serious problem in both districts, by less than one-quarter of the households. Bird attack is commonly a problem with sorghum, millet and rice. Insects and stalk borer caused the most problems in Marromeu, affecting around 10% of households surveyed. Locusts were only mentioned by 7% of households, although there was a red locust outbreak during the 1996-7 rainy season that prompted a Southern Africa regional response, with support from a number of organizations working in Sofala Province, including FHI/M.

2 3 5 Post-harvest Storage of Agricultural Products

The ability to store surplus crop production for consumption or sale later in the season is an important aspect of rural household food security. Interviewees were asked whether they stored individual crops following the 1995-6 season's harvest and for how long. The percentage of households that stored the principal food grains (maize, sorghum, rice, cowpea, groundnut and millet) and the average grain storage time is shown in Table 46. Overall 90% of the households surveyed stored food grains following the 1995-6 season's harvest, with 68% storing until the next sowing season (at least 7 months) and 46% storing until the 1996-7 season's harvest. These results indicate that the food security situation following the 1995-6 growing season was better than that following the previous two growing seasons, reflecting the relatively higher yields obtained following the 1995-6 season. The average food grain storage time was slightly higher in Nhamatanda (6.6 months) than in Marromeu (5.6 months), probably as a result of the higher levels of crop production in Nhamatanda.

Table 46 Percentage of households that stored food grains* from the 1995-6 harvest and the average grain storage time per household in months, by district

District	Households that Stored Food Grains from the 1995-6 Harvest (% of total households)			Average Grain Storage Time in Months (among households that stored grain)
	Stored	Stored at least Until next Sowing season**	Stored at least until next harvest***	
Marromeu	89	68	47	5.6
Nhamatanda	92	68	45	6.6
Both Districts	90	68	46	6.1

(*) This data is averaged over six food grain crops (maize, sorghum, rice, cowpea, groundnut, and millet)

(**) Grain stored until the next sowing season is considered to have been stored from as early as March 1996 until October 1996 (i.e. 7 months or more)

(***) Grain stored until the next harvest is considered to have been stored at least until March 1997 (i.e. 12 months or more)

The percentage of households storing individual crops is presented in Tables 47 and 48. Maize was the most frequently stored grain in both districts. Sorghum, rice and millet were also important in Marromeu, being stored by almost one-half of households surveyed. In Nhamatanda, about one-quarter of households stored sorghum and cowpea, in addition to maize. The storage of groundnut was largely limited to Nhamatanda (12% of households). Among the root crops, cassava was stored by 10% of households in Marromeu. Almost all families growing sesame appeared to store their crop.

Table 47 Percentage of households that stored food grains to sell or eat later, as a percentage of total households, by crop and district

District	Households that Stored Food Grains (% of total households)					
	Maize	Sorghum	Rice	Cowpea	Groundnut	Millet
Marromeu	80	47	47	10	1	48
Nhamatanda	91	27	9	25	12	6
Both Districts	86	37	28	18	6	27

Table 48 Percentage of households that stored oilseed/root and tuber crops to sell or eat later, as a percentage of total households, by crop and district

District	Households that Stored Oilseed/Root and Tuber Crops (% of total households)			
	Cassava	Sweet Potato	Sunflower	Sesame
Marromeu	10	5	-	3
Nhamatanda	1	3	0&	7
Both Districts	5	4	0&	5

(&) One family in Nhamatanda stored sunflower

Farmers were also questioned concerning the reasons why they store individual crops and the results are presented in Table 49 overleaf, as a percentage of households storing each crop. The primary reason for storing any crop was for consumption, mentioned by 90% of the households surveyed. In the case of grain and oilseed crops, the second most important reason was to save seeds for the next season, cited by 74% of households. "To give to others" was a reason given for most crops by around one-quarter of the households surveyed. The storage of maize for sale was cited by 29% of households storing maize in Marromeu and by 26% of households storing maize in Nhamatanda. Storage for sale was also important for sesame, particularly in Marromeu (40% of households storing sesame). Over 10% of households in Nhamatanda said that they stored cowpea, groundnut, millet and sweet potato to sell and in Marromeu, 14% of households stored cassava for sale. Crop storage for feeding animals was of little importance.

The average storage time in months for the food grains and other crops are presented in Tables 50 and 51, respectively. The average number of months that maize was stored differed between districts, with farmers in Marromeu storing for an average of 5.8 months and those in Nhamatanda for an average of 7.5 months. This difference reflects the smaller quantity of produce obtained by farmers in Marromeu. The remaining cereals (sorghum, rice and millet), the oilseed crops (groundnut, sunflower and sesame) and the root and tuber crops (cassava and sweet potato) were all stored for between five and six months, with little difference between districts. Differences were apparent in the average number of months that cowpea was stored, with farmers in Marromeu storing for only 3.5 months, while farmers in Nhamatanda stored for 5.1 months. Again this difference between districts may reflect differences in the quantity of cowpea harvested following the 1995-6 season. The 1996 FHI/M Mid-Term Survey showed that the average cowpea production of households producing more than 0 kg was 163 kg in Marromeu and 209 kg in Nhamatanda.

Table 50 Average storage time in months for food grain crops among households storing each crop, by crop and by district

District	Average Storage Time in Months for Food Grains (among households that stored each crop)					
	Maize	Sorghum	Rice	Cowpea	Groundnut	Millet
Marromeu	5.8	5.5	5.8	3.5	6.7*	5.6
Nhamatanda	7.5	5.9	6.0	5.1	6.2	6.0*
Both Districts	6.7	5.6	5.8	4.6	6.2	5.7

(*) These averages are based on less than 20 observations

Table 49 Reasons for storing agricultural products, as a percentage of households that stored each crop, by crop and by district

District	Crops	Reasons for Storing Agricultural Products (% of households that stored each crop)				
		For Consumption	For Sale	To Feed the Animals	To Give to Others	To Save for Seeds
Marromeu	Any Crop	88	25	2	23	79
	Maize	99	29	2	25	85
	Sorghum	98	8	7	28	89
	Rice	98	9	1	23	91
	Cowpea	97	0	0	23	73
	Groundnut	100*	0*	0*	0*	100*
	Millet	93	3	1	22	88
	Cassava	79	14	0	24	24
	Sweet Potato	71*	7*	0*	21*	21*
	Sunflower	-	-	-	-	-
	Sesame	90*	40*	0*	20*	70*
Nhamatanda	Any Crop	91	25	2	24	69
	Maize	100	26	2	24	73
	Sorghum	96	8	1	21	71
	Rice	100	4	8	27	88
	Cowpea	96	15	0	11	75
	Groundnut	88	11	0	9	80
	Millet	94*	11*	0*	6*	67*
	Cassava	100*	0*	0*	67*	33*
	Sweet Potato	89*	11*	0*	0*	22*
	Sunflower	100*	0*	0*	0*	100*
	Sesame	95	14	0	19	90
Both Districts	Any Crop	90	25	2	24	74
	Maize	99	27	2	25	79
	Sorghum	97	8	1	26	83
	Rice	98	8	2	23	90
	Cowpea	95	11	0	14	74
	Groundnut	89	11	0	8	82
	Millet	96	4	1	20	85
	Cassava	81	13	0	28	25
	Sweet Potato	78	9	0	13	22
	Sunflower	100*	0*	0*	0*	100*
	Sesame	94	23	0	19	84

(*) These percentages are based on less than 20 observations

Table 51 Average storage time in months for oilseed/root and tuber crops among households storing each crop, by crop and by district

District	Average Storage Time in Months for Oilseed/Root and Tuber Crops (among households storing each crop)			
	Sunflower	Sesame	Cassava	Sweet Potato
Marromeu	-	5.3*	5.8	5.4*
Nhamatanda	5.0*	6.2	5.7*	5.9*
Both Districts	5.0*	5.9	5.8	5.6*

(*) These averages are based on less than 20 observations

The length of time that farmers are able to store their agricultural produce without suffering undue storage losses influences the amount of produce produced, stored, and sold, and the amount of food purchased. The use of appropriate storage methods would allow farmers to store their produce for longer. Interviewees were asked in what form they stored their maize, whether as grain, as cobs with the husk, as cobs without the husk or as flour. The results are presented in Table 52, as a percentage of households that stored maize. There were considerable differences between districts in the frequency with which the alternative methods of maize storage were used. In Marromeu, the most popular method of storing maize was as grain (41% of households), followed closely by the storage of maize as cobs with husks (by 38% of households). Maize was stored as cobs without the husk in 26% of households. Clearly families in this district would benefit from some information concerning the protective nature of the husk during storage. In Nhamatanda, on the other hand, the majority of households stored their maize as cobs with the husk (83% of households) with one-fifth storing maize as grain and only 5% as cobs without the husk. Nobody stored maize as flour. A higher proportion of farmers in Nhamatanda appear to be aware of appropriate maize storage techniques, probably because they sell a greater proportion of their produce (see Tables 38 and 39) and are aware that storing maize in the husk ensures a better quality stored product.

Table 52 Methods used for storing maize, as a percentage of households that stored the crop, by district

District	Method Used for Storing Maize (% of households that stored maize)			As Flour
	As Grain	As Cobs With Husk	As Cobs without Husk	
Marromeu	41	38	26	0
Nhamatanda	20	83	5	0
Both Districts	30	62	15	0

The percentage of households using selected storage techniques is shown in Table 53. Among households storing agricultural produce, 28% of households in Marromeu and 68% of households in Nhamatanda stored produce in a granary. The majority of these households used a granary with a roof. A fire underneath was used by 22% of the surveyed households in Marromeu and by 38% of the households in Nhamatanda. FHI/M has shown that the use of a plastic lining inside a storage container, such as a basket, increases storage time. This technique was only used by seven households and requires further demonstration and promotion. Six households claimed to use rat guards. However, none of these households used a granary of any type. It is likely, therefore, that these interviewees mentioned that they use rat guards as they were aware that FHI/M encourages the use of this technique to control rat damage during storage.

Table 53 Percentage of households that used selected storage techniques, among households storing agricultural produce, by district

District	Households that Used Selected Storage Techniques (% of households storing agricultural produce)					Rat Guards
	Any Type of Granary	Granary With a Roof	Granary Without a Roof	Plastic Lining	Fire Underneath	
Marromeu	28	23	7	1	22	0
Nhamatanda	68	57	18	2	38	2
Both Districts	48	40	12	1	30	1

Table 54 presents the methods used to store each food grain or oilseed crop in each district and Table 55 presents the methods used for the root and tuber crops. The results are presented as the percentage of households that use different techniques in the storage of each crop and will be summarized below.

Table 54 Methods used for storing food grains/oilseed crops from the 1995-6 harvest, as a percentage of households that stored each crop, by district

Crop	Storage Method	District (% of households that stored each crop)		
		Marroneu	Nhamatanda	Both Districts
Maize	Granary with roof	28	61	46
	Granary without roof	5	15	10
	Basket	12	4	7
	Jar or pot	0&	3	2
	With Fire underneath	26	41	34
	Sack	38	17	27
	Shelf	43	19	30
	Hanging	8	7	7
	Drum	0	1	0&
Sorghum	Granary with roof	16	25	19
	Granary without roof	4	11	6
	Basket	30	18	26
	Jar or pot	4	16	8
	With Fire underneath	10	8	9
	Sack	58	39	51
	Shelf	27	18	24
	Plastic Liner	1	3	1
	With Rat Guards	0	1	0&
	Hanging	4	0	3
	Bottle	0	3	0&
	Gallon Can	0	1	0&
Rice	Granary with roof	14	12	14
	Granary without roof	3	8	4
	Basket	25	12	23
	Jar or pot	1	15	3
	With Fire underneath	6	0	5
	Sack	70	81	72
	Shelf	25	8	23
	Hanging	4	0	4
Cowpea	Granary with roof	7	16	13
	Granary without roof	10	12	11
	Basket	13	4	7
	Jar or pot	13	15	14
	With Fire underneath	13	15	14
	Sack	43	51	49
	Shelf	13	4	7
	Plastic Liner	0	4	3
	With Rat Guards	0	3	2
	Hanging	13	11	11
	Bottle	0	3	2
	Tin Can	7	0	2

(&) One family in Marroneu stored their maize in a jar/pot. One family in Nhamatanda stored their maize in a drum. One family in Nhamatanda stored their sorghum with rat guards. Two families in Nhamatanda stored their sorghum in a bottle. One family in Nhamatanda stored their maize in a gallon can.

Note: Shading indicates common seed storage methods.

Table 54(continued) Methods used for storing food grains/oilseed crops from the 1995-6 harvest, as a percentage of households that stored each crop, by district

Crop	Storage Method	District (% of households that stored each crop)		
		Marromeu	Nhamatanda	Both Districts
Groundnut	Granary with roof	0*	17	16
	Granary without roof	0*	3	3
	Jar or pot	0*	14	13
	With Fire underneath	0*	3	3
	Sack	67*	71	71
	Shelf	33*	3	5
	With Rat Guards	0*	3	3
	Hanging	0*	6	5
	Gallon Can	0*	3	3
Millet	Granary with roof	19	11*	18
	Granary without roof	3	11*	4
	Basket	33	17*	31
	Jar or pot	13	6*	12
	With Fire underneath	9	11*	9
	Sack	47	56*	48
	Shelf	22	11*	20
	Plastic Liner	1	0*	1
	With Rat Guards	0	6*	1
	Hanging	3	0*	2
Sunflower	Bottle	-	100*	100*
Sesame	Granary with roof	0*	19	13
	Granary without roof	0*	5	3
	Basket	10*	5	6
	Jar or pot	10*	43	32
	With Fire underneath	0*	5	3
	Sack	60*	38	45
	Shelf	10*	0	3
	With Rat Guards	10*	0	3
	Hanging	0*	10	6
	Bottle	0*	5	3
	Jerry Can	0*	5	3

(*) These percentages are based on less than 20 observations

Note Shading indicates common seed storage methods

In the case of maize, one-third of the households in Marromeu and three-quarters of the households in Nhamatanda stored their maize in a granary, which, in the majority of cases, had a roof and was presumably located outside the house. Of these households, just under one-half used a fire underneath, presumably to reduce insect attack. One-quarter of those households using a granary without a roof also used a fire underneath. The use of granaries with a roof was more popular in Nhamatanda (used by 61% of households) than in Marromeu (28% of households). Nobody used rat guards on their granaries. The remainder of the interviewees appeared to store their maize inside the house, either in sacks (27% across districts), on a shelf (30%), or to a lesser extent in baskets. Eight households said that they stored their maize by suspending it over a fire, a method more commonly used for the storage of maize cobs for seed.

The use of a granary with or without a roof was much less frequently used to store sorghum than it was for storing maize. The majority of granaries had roofs and the use of granaries was again more common in Nhamatanda (used by 36% of households) than in Marromeu (used by 20% of households). Of these, 50% used a fire to reduce insect attack. The majority of households stored their sorghum in the house, either in sacks, baskets or on shelves.

Rice was principally stored inside the house, with only one-fifth of households using granaries. Again the majority of families using granaries preferred to use a granary with a roof. However, less than 20% of these households used a fire as a storage treatment, probably because rice is much less susceptible to insect attack than other food grains. The most common method of storing rice was in sacks, probably inside the house, being used by about three-quarters of the households surveyed. Baskets were used to a certain extent, particularly in Marromeu.

Cowpea was commonly stored inside the house, often in sacks (used by 43% of households in Marromeu and 51% of households in Nhamatanda). Granaries with roofs were used by 7% and 16% of surveyed households in Marromeu and Nhamatanda, respectively. Granaries without roofs were used by about one-tenth of households surveyed. One-half of the households using granaries also used a fire for insect control. Just over one-tenth of the households stored their cowpea in jars or pots, or suspended them from the ceiling, methods commonly used for seed storage.

Groundnuts, more common in Nhamatanda than in Marromeu, were stored principally in sacks (71% of households in Nhamatanda). Granaries with a roof were used by 17% of the households in that district and granaries without roofs by 3% of households.

Millet was stored principally in the house, with only 22% of households in each district using granaries. In Marromeu, the majority of the granaries had roofs but in Nhamatanda, only one-half had roofs. A fire was used by almost two-thirds of the households using granaries. Sacks and baskets were both commonly used to store millet.

The family that grew sunflower stored their produce in a bottle. Sesame was quite widely grown in Nhamatanda. Nineteen percent of these families stored their sesame in a granary with a roof and 5% in a granary without a roof. Jars, pots or sacks were the most common methods of storing sesame.

Cassava was widely grown in Marromeu. Households storing cassava in Marromeu (Table 55) commonly stored their produce in the house, with only 10% of households using granaries with roofs and 7% using granaries without roofs. Shelves and sacks were used by between one-third and one-half of the households. Although few households stored sweet potato, this crop was commonly stored on shelves inside the house, either in sacks or in baskets. Only two families in Marromeu stored their sweet potato in a granary, one with a roof and one without a roof.

Table 55 Methods used for storing root and tuber crops from the 1995-6 harvest, as a percentage of households that stored each crop, by district

Crop	Storage Method	District (% of households that stored each crop)		
		Marromeu	Nhamatanda	Both Districts
Cassava	Granary with roof	10	0*	9
	Granary without roof	7	0*	6
	With A fire	3	0*	16
	Sack	31	33*	31
	Shelf	48	0*	44
	With Rat Guards	0	33*	3
	Hanging	14	33*	16
Sweet Potato	Granary with roof	7*	0*	4
	Granary without roof	7*	0*	4
	Basket	0*	11*	4
	Sack	7*	11*	9
	Shelf	43*	22*	35
	Hanging	7*	0*	4

(*) These percentages are based on less than 20 observations

Food grain losses in storage are known to be high in small-scale farm operations throughout the developing world, especially in tropical and subtropical countries. In the 1997 Baseline Survey, farmers were asked to estimate the portion of each crop that was lost in storage. The same percentage-loss scale was used as described for farmer-estimated in-field losses (Table 44). Table 56 presents the percentage of households citing storage losses in any crop and in individual crops. Overall, 77% of households lost some of their stored agricultural produce. Among the food grains, losses were most common in maize, with 83% of households storing maize in Marromeu experiencing storage losses and 78% of households in Nhamatanda suffering storage losses. About two-thirds of the surveyed households in each district suffered losses of sorghum, rice, and cowpea during storage. A similar scale of storage losses was experienced by households storing millet and cassava in Marromeu, while one-third to one-half of the households in Nhamatanda lost these crops in storage. Between one-third and one-half of the households surveyed in each district suffered storage losses of groundnut, sesame and sweet potato.

The percentage of households suffering storage losses of less than 25% or of more than 75% (as estimated by the interviewees) are presented on a crop-by-crop basis in Table 57. In general, storage losses of the principal food grains tended to be slightly higher in Marromeu than in Nhamatanda. In the case of maize, sorghum, rice, and cowpea, between 50% and 80% of households storing these crops and suffering storage losses, lost less than 25% of their stored produce. Less than 5% of households storing these crops suffered large storage losses of more than 75% of their stored produce. These results suggest that post-harvest storage losses were not very serious following the 1995-6 season's harvest. The levels of groundnut and sesame storage losses were slightly higher, with less than 50% of households losing less than 25% of their stored produce and one-quarter of the sesame producers in Marromeu suffering losses of 75% or more. Losses of stored cassava and sweet potato tended to be small, with the majority of households losing less than 25% of their stored produce.

These results support those obtained in earlier surveys and imply that the majority of farmers in these districts suffer from little or no storage losses. These farmer-estimated storage loss estimates tend to be lower than storage figures generally reported for small-scale traditional farms in tropical or subtropical developing countries, suggesting that farmers tend to underestimate the extent of their storage losses. Table 46 showed that the average grain storage time following the 1995-6 harvest was 6.1 months. Tables 50 and 51 show that this average estimate is representative of all crops stored, with the possible exception of cowpea which was only stored for an average of 3.5 months in Marromeu. Given these average storage times, it is likely that, if weevils were a storage problem, weevil populations would have developed sufficiently to have a noticeable effect on the quality of the stored grain in the majority of households. Farmers should therefore be aware of any storage problems they may have caused by insect damage. It is possible, however, that farmers in the target area have a higher tolerance of storage damage, as their stored crops are principally used for consumption (Table 49), leading to the underestimation of the extent of their storage losses. Farmers that sell a significant proportion of their agricultural produce are likely to be more aware of the extent and gravity of their storage losses, as traders will only buy good quality grain.

The problems encountered during crop storage are presented in Table 58, as a percentage of households that stored each crop. The greatest storage losses were caused by rodents and insects (principally weevils). For most crops, the percentage of households suffering from rodents was similar to the percentage of households suffering from insects. In the case of rice, groundnut and cassava, households suffered principally from rodents. Rotting during storage was cited as a problem particularly for cassava and sweet potato and, in Nhamatanda, for maize. A small proportion of households mentioned termites, theft, heavy rains/floods and fungus or other diseases as storage problems.

FHI/M has developed a grain storage research program, with the objective of identifying appropriate technologies to minimize storage losses. These technologies are being transferred to farmers as part of the FHI/M/District Department of Agriculture extension program.

Table 56 Percentage of households citing storage losses, as a percentage of households that stored each crop, by crop and district

District	Households Citing Storage Losses (among households that stored each crop)										
	Maize	Sorghum	Rice	Cowpea	Groundnut	Millet	Sunflower	Sesame	Cassava	Sweet Potato	Any Crop
Marromeu	83	75	70	67	33*	63	-	40*	62	43*	77
Nhamatanda	78	60	54	65	51	44*	100*	33*	33*	56*	77
Both Districts	81	70	68	66	50	60	100	35	59	48	77

Table 57 Households with storage losses of less than 25% or of more than 75% (as estimated by farmers), as a percentage of households that stored each crop and suffered storage losses, by crop and district

District	Extent of Storage Losses (% of households that stored each crop and suffered storage losses)									
	Maize		Sorghum		Rice		Cowpea		Groundnut	
	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%
Marromeu	76	3	79	3	70	1	85	5	0*	0*
Nhamatanda	68	1	63	4	64*	0*	53	0	44*	6*
Both Districts	72	2	74	3	54	1	62	1	42*	5*

District	Extent of Storage Losses (% of households that stored each crop and suffered storage losses)									
	Millet		Sunflower		Sesame		Cassava		Sweet Potato	
	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%	Less than 25%	More than 75%
Marromeu	79	3	-	-	25*	25*	89*	0*	83*	0*
Nhamatanda	75*	0*	0*	0*	43*	0*	0*	0*	100*	0*
Both Districts	79	3	0*	0*	36*	9*	84*	0*	91*	0*

Table 58 Problems encountered during crop storage, as a percentage of households that stored each crop, by crop and by district

District	Crop	Problems Encountered During Crop Storage (among households that stored each crop)							
		No Problems Encountered	Termites	Insects	Rodents	Theft	Heavy Rains/ Floods	Fungus and Other Disease	Rotting
Marromeu	Any Crop	25	5	60	71	0&	3	2	9
	Maize	8	4	71	79	0&	3	2	7
	Sorghum	16	2	58	62	1	1	1	4
	Rice	20	4	18	61	1	4	0	1
	Cowpea	20	0	43	37	0	3	0	7
	Groundnut	67*	0*	33*	0*	0*	0*	0*	0*
	Millet	26	3	37	47	0	1	1	8
	Cassava	21	0	14	31	0	0	0	14
	Sweet Potato	29*	0*	0*	21*	0*	0*	0*	21*
	Sunflower	-	-	-	-	-	-	-	-
Sesame	40*	0*	10*	10*	0*	0*	0*	10*	
Nhamatanda	Any Crop	21	7	55	66	1	5	3	12
	Maize	7	5	57	70	1	5	3	11
	Sorghum	19	4	41	44	0	8	1	5
	Rice	23	8	0	50	0	0	0	0
	Cowpea	17	3	40	32	0	3	0	5
	Groundnut	34	0	9	34	0	0	0	3
	Millet	22*	0*	33*	28*	0*	11*	0*	6*
	Cassava	0*	67*	0*	67*	0*	0*	0*	33*
	Sweet Potato	0*	0*	0*	44*	0*	0*	0*	33*
	Sunflower	0*	0*	0*	0*	0*	0*	0*	0*
Sesame	48	0	0	10	0	5	0	0	
Both Districts	Any Crop	23	6	58	69	1&	4	3	10
	Maize	8	4	63	74	1	4	2	9
	Sorghum	17	3	52	55	0&	1	1	5
	Rice	20	4	15	60	1	4	0	1
	Cowpea	18	2	41	33	0	7	0	6
	Groundnut	37	0	13	32	0	0	0	3
	Millet	25	3	36	45	0	2	1	4
	Cassava	19	6	13	34	0	0	0	16
	Sweet Potato	17	0	0	30	0	0	0	26
	Sunflower	0*	0*	0*	0*	0*	0*	0*	0*
Sesame	45	0	3	10	0	16	0	3	

(&) One family in Marromeu suffered storage losses of maize due to theft One family in Marromeu suffered storage losses of sorghum due to theft

2 3 6 Seed Supply

One of the objectives of FHI/M's agricultural development programs is to encourage farmers to use, select and save their own seed. In the 1997 Baseline Survey, interviewees were asked where they obtained the seed that they had planted during the previous 12 months. Table 59 presents the percentage of households that planted seed saved from a previous harvest, purchased or exchanged seed, obtained seed free-of-charge, or obtained seed by purchasing/exchanging as well as free-of-charge. Exchanged seed represents seed obtained from family, friends or neighbors in exchange for products or other seed.

Table 59 Sources of seed planted during the previous 12 months, as a percentage of total households, by district

District	Source of Seed* (% of total households)			
	Saved	Purchased/ Exchanged**	Provided Free-of- Charge***	Purchased/Exchanged and Free-of-Charge
Marromeu	66	17	18	6
Nhamatanda	52	45	7	7
Both Districts	59	31	13	7

(*) A number of families used seed from more than one source and therefore the total percentage exceeds 100

(**) Exchanged seed represents seed obtained from family, friends or neighbors in exchange for products or other seed

(***) Seed provided free-of-charge represents gifts from humanitarian organizations, international organizations or Government departments

Although the greater proportion of households used seed saved from a previous harvest for plantings made during the previous 12 months, the percentages were surprisingly low (66% of households in Marromeu and 52% of households in Nhamatanda). Slightly over one-half of the households in Nhamatanda also obtained seed by purchase or exchange to complement the seed they saved from their fields. Very few (14% of households) planted seed obtained free-of-charge. In Marromeu, on the other hand, saved seed was the principal source of seed, with only 23% of the households planting purchased or exchanged seed and 24% planting seed obtained free-of-charge.

Surveyors asked those households that used purchased/exchanged seed and/or seed obtained free-of-charge what was the source of their seed. Table 60 presents the sources of seed among those households that purchased or exchanged seed only, but did not obtain seed free-of-charge. Those households that both purchased/exchanged seed and obtained seed free-of-charge were omitted from this table to facilitate interpretation of the principal seed sources.

Purchased seed was primarily obtained from the local shop or market, in 58% of households in Marromeu and 75% of households in Nhamatanda. Only 10% of households in Nhamatanda purchased seed from Beira. Very few households purchased seed from the FHI/M Experimental Station in Lamego or from SEMOC (Sementes de Moçambique, the national seed company of Mozambique). The majority of exchanged seed was obtained from family members or neighbors, namely 46% of households in Marromeu and 16% households in Nhamatanda. One household obtained seed in exchange for labor. This represented their only source of seed, as they did not have seed saved from the previous cropping season. It is not known whether the seed that one household obtained from the church was purchased or exchanged for other products. Nevertheless, it seems likely that this family has been misclassified, as the church represented their only source of seed.

The sources of seed among those households that obtained seeds free-of-charge but did not purchase/exchange seed are shown in Table 61.

Table 60 Sources of seeds used by households in the previous 12 months, as a percentage of households who purchased or exchanged seed prior to the planting season, by district

Source of Purchased/Exchanged Seeds Used by Households in the Previous 12 Months (among households who purchased or exchanged seed)*							
District	Family Member/ Neighbor	Church	Local Shop Or Market	Shop in Beira	FHI/M Experimental - Station -Lamego	SEMOC	In exchange For labor
Marromeu	46	0	58	0	0	0	0
Nhamatanda	16	1	75	10	1	3	1
Both Districts	25	1	71	7	1	2	1

(*) Households that purchased/exchanged seed and obtained seed free-of-charge were omitted from this analysis

Table 61 Sources of seeds used by households in the previous 12 months, as a percentage of households who received seed free-of-charge prior to the planting season, by district

Source of Seeds Received Free-of-Charge, by Households in the Previous 12 Months (among households who received seed free-of-charge)*								
District	Family Member/ Neighbor	Church	Local Shop or Market	Shop in Beira	FHI/M Experimental Station - Lamego	District Department of Agriculture	Another NGO	Unknown Source
Marromeu	82	2	4	0	6	6	2	2
Nhamatanda	86	0	0	5	0	5	0	5
Both Districts	83	1	3	1	4	5	1	3

(*) Households that obtained seed free-of-charge and purchased/exchanged seed were omitted from this analysis

The most important source of this seed was family members and neighbors, cited by over 80% of households in both districts. The proportion of households receiving seed in this way is relatively high, indicating that seeds were in good supply at the beginning of the 1996-7 season. Other sources of free seed were churches, other non-governmental organizations, the FHI/M Experimental Station in Lamego and the District Department of Agriculture. Clearly there were far fewer seed donations in the 12 months prior to the survey than there were in earlier years. Seed obtained from the Experimental Station was probably seed of improved varieties distributed for farmer evaluation. Unfortunately, three households that obtained seed free-of-charge said that they obtained their seed either from the local shop or market (two households), or from a shop in Beira (one household). This suggests that these interviewees might have been misclassified.

Seed selection prior to planting is an important approach to ensuring that the seed planted is of good quality and will give good plant stands and good crop development. Traditionally farmers plant many (up to 15 or more) seeds per planting station to ensure that some seeds germinate. If, through germination testing, farmers have confidence in the quality of seed they are planting, they can reduce the number of seeds per planting station and still ensure the proper number of plants per station. Simple germination tests will also ensure that a good plant stand is obtained from the first planting, and will limit the need for replanting. Another important technique is the preselection of the best plants at the field level so that seed can be saved specifically from these selected plants, after harvesting. Interviewees were asked how they selected and prepared their seed and the data obtained are presented in Table 62. Around one-half of the surveyed households were using some form of seed quality control practice. The most common practice was to test seed germination prior to planting, being used by over one-third of the households surveyed. One-quarter or less of the households surveyed selected seed at the field level.

Table 62 Percentage of households that engage in seed quality control practices, as a percentage of total households, by district

District	Households that Engage in Seed Quality Control Practices (% of total households)		
	Select seed at the field level	Test seed for germination	No seed Preparation practices
Marromeu	26	42	48
Nhamatanda	17	39	55
Both Districts	22	40	52

2.3.7 Other Agricultural Inputs

Section 2.2.4 described the types of agricultural instruments owned by households surveyed during the 1997 Baseline Survey. The survey revealed that almost all surveyed households owned at the very least one hoe, with machetes and axes being owned by over one-half of the households. Surveyors asked interviewees whether they made their agricultural instruments themselves, whether they purchased them or exchanged them for other products and/or whether they obtained them free-of-charge. These data are presented in Table 63.

Agricultural instruments used by households in Marromeu were most commonly purchased or exchanged (55% of households), with only 19% of households obtaining tools free-of-charge. Four percent of households in Marromeu used homemade tools. In Nhamatanda, the greatest proportion of households used tools obtained from donations (92%), while a significant proportion of the households obtained tools through purchase/exchange (75%).

The 1996-7 cropping season's floods were more widespread in the Dondo/Nhamatanda region than in Marromeu. Due to its greater accessibility, the communities living in Nhamatanda were targeted for seeds and tools distributions and consequently, a large proportion of surveyed households in Nhamatanda District were using tools received through donations. Nobody used homemade tools in Nhamatanda.

Table 63 Sources of agricultural instruments used during the previous 12 months, as a percentage of total households, by district

District	Source of Agricultural Instruments* (% of total households)			
	Home Made	Purchased/ Exchanged**	Provided Free-of- Charge***	Purchased/Exchanged or Free-of-Charge
Marromeu	4	46	10	9
Nhamatanda	0	70	87	5
Both Districts	2	58	10	7

(*) A number of families used agricultural instruments from more than one source and therefore the total percentage exceeds 100

(**) Exchanged agricultural instruments represent tools obtained from family, friends or neighbors in exchange for other products

(***) Agricultural instruments provided free-of-charge represent gifts from humanitarian organizations, international organizations or Government departments

Table 64 presents the sources of purchased/exchanged agricultural instruments used by those families who used purchased/exchanged tools. Those households using purchased/exchanged tools and tools obtained free-of-charge were not included in this presentation. The most important source of purchased agricultural instruments was the local shop or market, with 73% of households in Marromeu and 81% of households in Nhamatanda buying their tools locally. A larger proportion of families in Nhamatanda purchased tools from shops in Beira (20%) than in Marromeu, reflecting the fact that Beira is much closer to Nhamatanda than to Marromeu. A few households obtained tools from the FHI/M during the last distribution in November 1994, from the District Department of Agriculture, from another NGO, from a commercial salesperson or from an ironmonger. It is likely that these tools were purchased rather than exchanged. Family members or neighbors represented a more important source of tools in Marromeu than in Nhamatanda, reflecting the fact that Marromeu is much more isolated and that it is therefore more difficult to purchase tools. In such cases, the tools were probably exchanged for other products.

The sources of the agricultural instruments used by households who only obtained tools free-of-charge and who did not purchase/exchange tools are presented in Table 65, as the percentage of households that owned such tools. The most important sources of donated hand tools in Marromeu were the FHI/M (36% of households) and family members or neighbors (32%), with 19% of households obtaining tools from the District Department of Agriculture. In Nhamatanda, family members or neighbors represented the most important source of free hand tools, cited by 44% of households. The FHI/M Experimental Station and the District Department of Agriculture were cited by around one-tenth of these households. Other specified sources of donated tools were ORAM, other NGOs, the DPCCN and UNOMOZ. Five households stated that they had obtained tools free-of-charge from a local shop or the local market. It is likely that these families have been misclassified.

Table 64 Sources of agricultural instruments used by households in the previous year, as a percentage of households who purchased or exchanged some or all of their tools, by district

Source of Agricultural Instruments which were Purchased/Exchanged by Households in the Previous Year (among households who purchased or exchanged tools)*									
District	Family Member/ Neighbor	Church	Local Shop Or Market	Shop in Beira	FHI/M	District Department of Agriculture	Another NGO	Commercial Salesperson	Ironmonger
Marromeu	17	1	73	4	1	1	1	1	1
Nhamatanda	2	1	81	20	1	1	1	0&	0
Both Districts	8	1	78	13	1	1	1	1	1

(&) One family in Nhamatanda obtained their tools from a commercial salesperson

(*) Households that purchased/exchanged agricultural instruments and obtained tools free-of-charge were omitted from this analysis

Table 65 Sources of agricultural instruments used by households in the previous year, as a percentage of households who obtained some or all of their tools free-of-charge, by district

Source of Agricultural Instruments which were Obtained Free-of-Charge by Households in the Previous Year (among households who obtained tools free-of-charge)*									
District	Family Member/ Neighbor	Local Shop Or Market	FHI/M	District Department of Agriculture	ORAM	Another NGO	DPCCN	UNOMOZ	Unknown Source
Marromeu	32	7	36	19	0	7	0	0	0
Nhamatanda	44	11	7	11	4	11	4	4	7
Both Districts	38	9	22	16	2	9	2	2	3

(*) Households that obtained agricultural instruments free-of-charge and purchased/exchanged tools were omitted from this analysis

The proportion of households possessing agricultural instruments was presented earlier in Table 23. Surveyors also asked interviewees what type of agricultural inputs they use. This question provided data on the proportion of households using improved varieties, chemical products and sacks, shown in Tables 54 and 55 to be a common means of storing agricultural products, as well as agricultural instruments. It should be noted that it was necessary to verify the answers to this question against those of other questions concerning the use of improved varieties, pesticides and chemical fertilizers, and sacks for storing agricultural produce, as a means of obtaining the data presented in Table 66.

Table 66 Percentage of households using agricultural inputs, as a percentage of total households, by district

District	Households Using Agricultural Inputs (% of total households)				
	No Agricultural Inputs	Improved Varieties	Chemical Products	Sacks	Agricultural Instruments
Marromeu	0%	13	1	78	100%
Nhamatanda	0	40	2	74	100
Both Districts	0	27	1	77	100

(%) One household in Marromeu did not own any agricultural implements (Table 21) but the interviewee said that they used agricultural instruments, presumably borrowing them from family members or neighbors when necessary. This family did not use any other type of agricultural input.

Farmers are encouraged to procure and plant the most appropriate varieties for their situation, which may, in certain cases, be seed of improved varieties. This phrase usually refers to seed of named varieties which have proven to be well adapted to the target area and cropping system, and to be of acceptable quality, disease resistance and yield characteristics. These varieties may be commercially available through SEMOC or may be under multiplication by non-governmental organizations such as FHI/M or by the DDA. Seed of improved varieties may be made available by non-governmental organizations, DDAs, or other organizations, for farmer evaluation or commercially, to compensate for the poorly developed commercial network. Interviewees were asked whether they used improved varieties. Table 66 demonstrates that improved varieties are more widely used in Nhamatanda (by 40% of households) than in Marromeu (13% of households). The improved varieties used by farmers in both districts may have come from the Experimental Station at Lamego or from the DDA. Improved seed was also distributed as part of the flood-relief seeds and tools distributions, which were more common in Nhamatanda than in Marromeu. In addition, the national seed company SEMOC has an outlet in Beira which is relatively accessible to farmers living in Nhamatanda.

Five households surveyed in the target districts used chemical products (pesticides), one in Marromeu and four in Nhamatanda. Sacks were used by three-quarters of the households surveyed. Not surprisingly, all households used agricultural instruments.

When interviewees using chemical products were asked where they obtained these products from, only four of the five interviewees provided a response (Table 67). In Marromeu, the interviewee obtained the chemical product from the DDA, who had provided training in appropriate use of this product. In Nhamatanda, the three interviewees that responded to the question had obtained their product from local shops or the local market. One person of the three said that they had had training in the use of this product. Two people had not had appropriate training. It would appear that some farmers are aware that chemical products have a role in crop production and wish to use them. However, they do not have access to information concerning the appropriate use of such chemicals. Even though FHI/M may not promote the use of chemical products, FHI/M should provide training in the appropriate use of chemical products to interested farmers, in order to avoid farmers using chemicals in an inappropriate manner.

Table 67 Source of chemical products, as a percentage of households that used chemical products and the percentage of households using chemical products that received appropriate training, by district

District	Number of Households Using Chemical Products	Source of Chemical Products (among households that used chemical products)*				Training Received in How to Use Chemical Products			
		Local Shops or Local Markets		District Department Of Agriculture		Yes		No	
		%	#	%	#	%	#	%	#
Marromeu	1	0	0	100	1	100	1	0	0
Nhamatanda	4	75	3	0	0	33	1	67	2
Both Districts	5	60	3	20	1	50	2	50	2

(*) One of the four households using chemical products in Nhamatanda did not respond to the questions concerning the source of the product they used and whether or not they received training. The percentage quoted here concerning the source of chemical products represents the percentage among all households using chemical products, rather than the percentage of households using chemical products and responding to the questions.

2.3.8 Livestock Production

Table 68 shows the percentage of households that raised livestock or poultry at the time of the 1997 Baseline Survey. Livestock production was more common in Marromeu than in Nhamatanda, with 88% and 77% of households raising any type of livestock or poultry, respectively. In both districts, chickens or ducks were the most commonly raised type of livestock, followed by pigs in Marromeu and goats in Nhamatanda. Pigs were also quite popular in Nhamatanda and to a lesser extent, goats in Marromeu. Rabbits were only raised by a small number of households, while none of the interviewees owned cattle or donkeys.

Table 68 Percentage of households raising livestock or poultry at the time of data collection, by animal and by district

District	Households Raising Livestock or Poultry (% of total households)						
	Any Type of Livestock	Chickens/ Ducks	Pigs	Rabbits	Goats	Cattle	Donkeys
Marromeu	88	84	34	2	11	0	0
Nhamatanda	77	74	17	1	19	0	0
Both Districts	82	79	26	1	15	0	0

The average number of each type of animal per household (herd or flock size), among households raising each type of animal, is presented in Table 69. The average number of chickens or ducks owned by households in Nhamatanda was slightly higher (12.8) than that in Marromeu (10.7). These average flock sizes are quite reasonable. Some households in each district (13% and 17% of households in Marromeu and Nhamatanda, respectively) raise flocks of more than 20 chickens or ducks. The average herd sizes of pigs and goats were 2.8 and 4.8, respectively.

While the proportion of households owning some type of livestock or poultry is reasonably high, ownership is largely restricted to poultry. There are clear opportunities for increasing the proportion of households owning pigs and goats, as these animals represent an important source of livelihood security, particularly in these target districts. FHI/M's SPEAR project has already contributed to raising the goat population slightly in these districts through the distribution of goats to vulnerable households. This type of restocking program should continue in order to significantly increase the

goat population in the target communities. Pig restocking programs are of lower priority, as pigs are susceptible to African Swine Fever and pig populations can be easily wiped out by this disease, the Veterinary Services of the DDA being inadequately equipped to prevent such outbreaks.

Table 69 Average number of animals per household, among households raising each type of livestock or poultry at the time of data collection, by animal and by district

District	Average Number of Animals per Household (among households raising each type of livestock or poultry)					
	Chickens/ Ducks	Pigs	Rabbits	Goats	Cattle	Donkeys
Marromeu	10.7	2.3	5.0	3.4	0	0
Nhamatanda	12.8	3.8	3.0	5.6	0	0
Both Districts	11.7	2.8	4.4	4.8	0	0

2.3.9 Vegetable Production

Vegetables are high-value crops and, as shown in Tables 10 and 11, can make a useful contribution to household income. Vegetables are also rich in nutrients and their production and consumption can improve household nutrition and health. For this reason, FHI/M's agricultural development projects have traditionally encouraged vegetable production during the dry season and assisted farmers to improve their horticultural practices.

Table 70 shows the percentage of households growing or selling horticultural crops and the average number of crops grown or sold in the target districts. The proportion of households surveyed growing any type of horticultural crop was very low, with only 18% of households in Marromeu and 30% of households in Nhamatanda growing any type of vegetable. These data represent a decrease in vegetable production compared with earlier surveys carried out in these districts. Over the last few years, vegetable seed distributions have been carried out in the target districts as part of the national emergency relief program. However, no distributions were implemented in the target districts prior to the 1997 dry season and consequently farmers had very limited access to seeds. At present only a small proportion of the farming community save seeds of a limited range of vegetable crops, largely because they are not aware of appropriate vegetable seed storage techniques. Seed can be purchased from SEMOC in Beira, but they have limited supplies. A greater proportion of interviewees in Nhamatanda grew vegetables than in Marromeu, probably because farmers in Nhamatanda have greater access to vegetable seed and can also sell vegetable produce more easily. This is also reflected in the greater average number of horticultural crops grown by households in Nhamatanda (1.9) than in Marromeu (1.4).

Although the 1997 Baseline Survey was carried out in August 1997, in the middle of the horticultural season, it is reasonable to assume that households that intended to produce vegetables already had their crops in the field. The data obtained from this survey should therefore give a realistic picture of the proportion of households growing horticultural crops during the 1997 dry season. Because of the timing of the survey, however, it is anticipated that the data concerning the proportion of households selling some of their vegetable production may be an underestimate, with some households selling production later in the season (after the survey). As mentioned earlier, two factors may have led to an underestimation of the proportion of households that sold horticultural produce: farmers tend to be reluctant to provide information concerning crop sales, and only those households that provided quantity and price data were considered to have sold produce. Nevertheless, the results show that, by the time of the survey, one-third or less of the vegetable-producing households had sold some of their produce, with an average of 1.3 and 1.5 crops being sold by households selling vegetables in Marromeu and Nhamatanda, respectively.

Table 70 Percentage of households that grew or sold any type of horticultural crop during the 1997 horticultural season, and the average number of horticultural crops grown or sold per household, by district

District	Households that Grew or Sold any type of Horticultural Crop (% of total households)		Average Number of Horticultural Crops Grown or Sold (among households that grew horticultural crops*)	
	Grew	Sold	Grown	Sold
Marromeu	18	4	1.4	1.3
Nhamatanda	30	12	1.9	1.5
Both Districts	24	8	1.7	1.5

(*)Households growing horticultural crops represent those families growing one or more of the following crops: onion, kale, cabbage, tomato, garlic, squash, lettuce, carrot, green pepper, or chili pepper

Table 71 presents the proportion of households that grew the different horticultural crops in each district during the 1997 dry season and the proportion that sold each crop by the time of the survey are given in Table 72. The most popular crops were tomato, squash, kale and onion, being grown by 11.7%, 8.8%, 6.5% and 5.7% of the households surveyed. Cabbage, garlic, lettuce, carrot and chili pepper were grown by less than 5% of the households surveyed, although garlic appeared to be particularly popular in Marromeu. In general, one-third or less of the households growing a particular crop, sold some of the produce, with the exception of squash, which was grown principally for consumption (Table 72). Vegetable production was slightly more popular in Nhamatanda than in Marromeu, probably because there are greater opportunities for selling vegetables. The data concerning the average land area dedicated to the different horticultural crops in the two districts shown in Table 73 confirms this trend, as households in Nhamatanda dedicated more land to horticultural crops than those in Marromeu. The exceptions were for the production of onion and garlic, which were allocated larger land areas in Marromeu than in Nhamatanda. Onion and garlic can be easily stored for consumption or sale later in the season. As Marromeu remains somewhat cut off during the rainy season, onion and garlic can be either consumed or sold at times when the availability of food in the local market is limited.

The 1997 Baseline Survey did not collect information concerning the sources of horticultural seeds, although the limited scale of vegetable production suggests that access to seeds was a limiting factor. This information would assist FHI/M to identify methods of improving farmer access to seeds. Although the interviewees were asked whether they use a series of improved agricultural practices (see Section 2.3.10), they were not asked specifically about their horticultural production practices. A number of techniques, such as the incorporation of organic matter, the correct use of irrigation, the correct use of shading, the use of compost to increase soil fertility, botanical insecticides, correct plant spacing, appropriate seed bed preparation techniques and correct transplantation practices can be used to increase vegetable yields. It would be informative to include questions concerning the specific use of these practices in vegetable production in a follow-up survey.

Table 71 Percentage of households that grew horticultural crops during the 1997 horticultural season, by crop and district

District	Households that Grew Horticultural Crops (% of total households)									
	Onion	Kale	Cabbage	Tomato	Garlic	Squash	Lettuce	Carrot	Green Peppers	Chili Peppers
Marromeu	5.7	2.3	0.3	5.7	4.0	5.7	0.3	0.0	0.0	0.0
Nhamatanda	5.7	10.7	5.3	17.7	0.7	12.0	3.0	0.3	0.0	1.7
Both Districts	5.7	6.5	3.2	11.7	2.3	8.8	2.0	0.2	0.0	0.8

Table 72 Percentage of households that sold horticultural crops during the 1997 horticultural season, by crop and district

District	Households that Sold Horticultural Crops* (% of total households)									
	Onion	Kale	Cabbage	Tomato	Garlic	Squash	Lettuce	Carrot	Green Peppers	Chili Peppers
Marromeu	1.7	0.3	0.0	2.0	0.3	0.0	0.0	0.0	0.0	0.0
Nhamatanda	1.3	3.0	1.7	7.3	0.0	1.7	1.0	0.0	0.0	0.3
Both Districts	1.5	1.7	0.8	4.7	0.2	1.0	0.5	0.0	0.0	0.2

(*) Only those households that provided complete quantity and price data are considered to have sold produce

Table 73 Average land area under cultivation in hectares to horticultural crops, by crop and by district, among households that grew each crop during the 1997 horticultural season

District	Average Land Area Under Cultivation in Square Meters, by Crop (among households that grew each crop and reported the area cultivated)									
	Onion	Kale	Cabbage	Tomato	Garlic	Squash	Lettuce	Carrot	Green Peppers	Chili Peppers
Marromeu	199*	52*	9*	77*	890*	1108*	30*	-	-	-
Nhamatanda	22*	255	187*	617	81*	918	24*	90*	-	6*
Both Districts	110	219	159*	486	774*	973	26*	90*	-	6*

(*) These averages are based on less than 20 observations

The promotion of environmentally sustainable agricultural practices is one of the essential components of an agricultural extension program. To provide a baseline for the evaluation of the impact of FHI/M's Development Activity Proposal, the 1997 Baseline Survey sought information concerning the present rates of adoption of a range of agricultural practices. Mid-Term and End-of-Project Surveys can then be used to evaluate the effectiveness of the FHI/M extension program by measuring changes in the adoption of recommended agricultural practices. Interviewees were asked what practices they used related to field preparation, planting methods including inter-cropping, soil conservation and the maintenance of soil fertility, irrigation and post-harvest planning and management. The results are presented in Tables 74 to 80 and will be discussed below.

Table 74 presents the percentage of households that used selected improved field preparation practices, namely to prepare fields without burning, to leave trees in the field, or to incorporate organic matter before sowing, and the percentage that do not use any of these improved field preparation practices. Burning fields to remove dry vegetation and to kill seeds is a very common practice in Mozambique. However, this practice reduces soil fertility by decreasing the organic matter content. Just less than one-third of the households surveyed said that they did not burn their fields before planting. There are clearly considerable opportunities to raise farmer awareness of this issue in the target communities. Likewise the majority of households surveyed said that they removed trees from the field after opening new land. This practice can lead to soil erosion, loss of accessible firewood sources and other benefits such as nitrogen fixing depending on the species of tree. The incorporation of organic matter was used by approximately one-third of the households surveyed in each district. Of the households surveyed, 51% in Marromeu and 48% in Nhamatanda did not use any of these improved field preparation practices, suggesting that an extension program designed to promote these techniques could have a significant impact. The percentage of households using one technique was 24% in Marromeu and 26% in Nhamatanda (25% overall).

Table 74 Percentage of households that used improved field preparation practices, by district

District	Households that Used Improved Field Preparation Practices (% of total households)			
	Prepare Fields Without Burning	Leave Trees In the Field	Incorporate Organic Matter before Sowing	No Improved Field Preparation Practice
Marromeu	28	15	34	51
Nhamatanda	29	23	30	48
Both Districts	28	19	32	50

The percentage of households using improved planting practices, namely to plant in lines, to reduce the spacing between lines/plants, to reduce the number of seeds per hole as a means of controlling field population, and to inter-crop cereals with legumes are presented in Table 75. In Marromeu, the most common practices were reducing the number of seeds per hole (61% of households) and planting in lines (51%). The proportion of households planting in lines was similar in Nhamatanda (54%) although less farmers reduced the number of seeds per hole (44%). In Nhamatanda, the most common practice was inter-cropping cereals with legumes, adopted by 59% of households. This practice was used to a much more limited extent in Marromeu. In both districts, just over one-third of households had already adopted the practice of reducing the spacing between lines and between plants. Clearly improved planting practices were more common than improved field preparation practices, probably because these techniques have provide short-term results which are readily observable in terms of production gains. However, 24% of households in Marromeu and 11% of households in Nhamatanda did not use any of these improved planting practices and 21% and 34% of households in each district, respectively, used only one of these techniques, giving scope for the further promotion of these extension messages.

Table 75 Percentage of households that used improved planting practices, by district

District	Households that Used Improved Planting Practices (% of total households)				
	Plant in Lines	Reduce Line/ Plant Spacing	Reduce the Number of Seeds per Hole	Inter-cropping Cereals with Legumes	No Improved Planting Practice
Marromeu	51	40	61	29	24
Nhamatanda	54	35	44	59	11
Both Districts	53	37	53	44	17

Inter-cropping of cereals with legumes helps to improve soil fertility while enabling farmers to spread their risk by diversifying crop output from the field. The inter-cropping of cereals with cereals, such as maize with millet or sorghum, or sorghum with millet is a common practice in the target districts. A cereal/cereal inter-crop results in competition between cereal crops and is detrimental to yield. Table 76 presents the percentage of households using different cereal/legume and cereal/cereal inter-cropping practices. Cereal/legume inter-crops were most common in Nhamatanda, where 56% of households planted maize with cowpea compared with 27% of households in Marromeu. Maize/groundnut inter-crops were used by less than one-fifth of the households surveyed but were also more common in Nhamatanda. Unfortunately, 37% of households plant cereal/cereal inter-crops, with over one-third of households planting maize with millet or sorghum and 10% or less planting sorghum with millet. There is considerable scope for the promotion of extension messages concerning the use of cereal/legume rather than cereal/cereal inter-cropping in both districts.

Table 76 Percentage of households that used selected cereal/legume and cereal/cereal inter-cropping practices, by district

District	Households that Used Selected Inter-cropping Practices (% of total households)					
	Cereal/Legume Inter-crop	Maize with Groundnut	Maize with Cowpea	Cereal/Cereal Inter-crop	Maize with Millet or Sorghum	Sorghum with Millet
Marromeu	29	3	27	40	37	10
Nhamatanda	59	14	56	34	33	6
Both Districts	44	9	42	37	35	8

There is a range of agricultural technologies that can be used by small-scale farmers to improve soil fertility, assist with soil conservation, and reduce soil erosion. Interviewees were asked what soil conservation/erosion control techniques they used. FHI/M was particularly interested in the frequency of adoption of the following techniques: construction of barriers to control run-off, use of hedgerows, preparation of contour terraces, use of "mulching", tree planting, use of compost, incorporation of animal manure, use of green manure crops, preparation of fields without burning, and use of crop rotations. The results are presented in Table 77. Again, approximately one-half of the households surveyed did not use any of the above-mentioned soil conservation practices, while 27% and 29% of households in Marromeu and Nhamatanda, respectively, used only one technique. Among those using such practices, the most common practices used were preparing fields without burning (28% of households surveyed), the use of crop rotations (11%), and the construction of barriers to control run-off (10%). All other techniques were used by less than 10% of households surveyed in each district. The promotion of soil conservation practices through the extension program could have a large impact on the rate of adoption of such practices in the target districts, thereby improving the sustainability of the farming systems used by these agricultural communities.

Table 77 Percentage of households that used selected soil conservation practices, by district

Households that Used Selected Soil Conservation Practices (% of total households)					
District	Construct Barriers of Grass/Trunks/Stones to Control Run-off	Use of Hedgerows	Contour Terracing	Mulching	Plant Trees in the Field
Marromeu	10	4	6	9	7
Nhamatanda	10	2	9	9	7
Both Districts	10	3	8	9	7

Households Using Selected Soil Conservation Practices (% of total households)						
District	Preparation/ Use Of Compost	Incorporation of Animal Manure	Use of Green Manure Crops	Prepare Fields Without Burning	Rotate Crops	No Soil Conservation Practices
Marromeu	4	1	3	28	15	51
Nhamatanda	6	5	3	29	7	49
Both Districts	5	3	3	28	11	50

Table 78 presents the proportion of households using selected pest control techniques, namely crop rotation, inter-cropping, natural pesticides, mechanical methods of pest control (such as traps or barriers), and/or pesticides. The most common pest control method was inter-cropping, used by 58% of the households surveyed. However, we have already seen in Table 76 that some farmers use inappropriate inter-cropping combinations, which can reduce crop productivity and do not control pest populations. The use of beneficial inter-cropping practices should be promoted, together with the use of crop rotations, which were used by only 11% of the target population. Of the households surveyed, 33% in Marromeu and 20% in Nhamatanda (27% overall) did not use any pest control method.

The use of traps or barriers to reduce field pest populations was used by almost one-third of the households surveyed. Botanical pesticides can be prepared by mixing leaves or bark from a number of local species in water and applying the resulting solution to the crops. FHI/M extension staff have received intensive training in the use of botanical pesticides to control field pests. At the time of the survey, only 4% of households in each district were using natural pesticides. There is considerable scope for the promotion of this method of reducing pest populations, together with the use of traps and barriers. Chemical pesticides were used by very few households in the survey area. This is not surprising as chemical products are largely unavailable in Sofala Province, and those that are available are very expensive.

Table 78 Percentage of households that used selected methods to control field pests, by district

Households that Used Methods to Control Field Pests (% of total households)					
District	Rotate Crops	Inter-cropping of any crop	Use of Natural Pesticides	Use of Traps/ Barriers	Use of Chemical Pesticides
Marromeu	15	50	4	27	0&
Nhamatanda	7	66	4	33	1
Both Districts	11	58	4	30	1

(&) One family in Marromeu used pesticides

As shown in Table 79, only one farmer in Nhamatanda used an irrigation pump, presumably for vegetable production. This household obtained income from the sale of onion, kale, cabbage and tomato. However, the area planted to each crop and the amount of income obtained by the time of the survey was equivalent to the average of the households surveyed, indicating that this household was not producing horticultural crops on a large scale.

FHI/M's extension program has incorporated recommendations concerning post-harvest planning and management, as a way of assisting farmers in planning and implementing appropriate strategies for marketing their surplus crops. Rather than selling surplus production immediately after the harvest, farmers are encouraged to store their surplus production for sale later in the season, when demand and prices are higher. The survey showed that 53% of households in Marromeu and 46% of households in Nhamatanda are aware of the issues associated with post-harvest planning and management.

Table 79 Percentage of households that used an irrigation pump and the percentage of households that used post-harvest planning and management, by district

District	Households that Used an Irrigation Pump (% of total households)	Households that Used Post-harvest Planning and Management (% of total households)
Marromeu	0	53
Nhamatanda	0&	46
Both Districts	0&	50

(&) One family in Nhamatanda used an irrigation pump

An index was calculated in an attempt to quantitatively assess farmers' understanding and use of "improved farm management" practices. The formula was as follows: respondents received a +1 point for every practice out of a list of 28 to which they responded "yes", except for burning fields and inter-cropping maize with sorghum/millet or sorghum with millet, for which each "no" response received a +1 point. Although neither recommended nor discouraged by FHI/M, the use of chemical fertilizers and synthetic pesticides each received +1 point in this index, because use of these inputs requires special knowledge and indicate a more technologically advanced system of farming. The "Improved Farm Management Knowledge Score" was calculated as the sum of points divided by the maximum possible number of points (28), multiplied by 100, for a minimum score of 0 and a maximum score of 100. The management practices allocated a +1 are listed below:

- Prepare fields without burning
- leave trees in the field
- incorporate organic matter before sowing
- use improved varieties
- select seed at the field level
- test seed for germination
- plant in lines
- reduce spacing between lines and between plants in a line
- reduce the number of seeds per hole
- rotate crops
- inter-crop maize with groundnut
- inter-crop maize with cowpea
- not use maize/sorghum or millet inter-crops
- not use sorghum/millet inter-crops
- use natural pesticides
- use mechanical methods of pest control (traps/barriers)
- use synthetic pesticides
- construct barriers of grass strips/ tree trunks/ stones
- use hedgerows
- use contour terracing
- use mulching
- plant trees in the field
- prepare and use compost
- incorporate animal manure
- use green manure crops
- use chemical fertilizers
- use an irrigation pump
- use post-harvest planning and management

Table 80 presents the average Improved Farm Management Knowledge (IFMK) score of households surveyed in the target districts and the percentage of households which fall into four categories of IFMK scores zero, 1 to 33.9, 34.0 to 66.9 and 67.0 to 100.0. The level of knowledge of improved farm management techniques, as measured by the IFMK Index, was similar in the two districts, with households in Marromeu and Nhamatanda having average IFMK scores of 22.7 and 24.5, respectively. This indicates that households in these districts used, on average, between six and seven improved techniques out of a possible 28. One family in each district obtained an IFMK score of zero. Among the remaining families, around 80% obtained IFMK scores of 1 to 33.9, representing the adoption of between 1 and 9 improved techniques. The remainder obtained IFMK scores of between 34.0 and 53.6, representing the adoption of between 10 and 15 improved techniques. There is clearly a need for rural communities in the target districts to continue to be exposed to improved farm management techniques through an extension program. Hopefully the proportion of households falling in the IFMK score range of 34.0 to 66.9 can be increased significantly by such an extension program.

Table 80 Average "Improved Farm Management Knowledge" score of the surveyed households, by district

District	Improved Farm Management Knowledge Score (IFMKS)				
	Average IFMK Score	IFMKS = 0	Percentage of Total Households with IFMKS 1-33.9	IFMKS 34.0-66.9	IFMKS 67.0-100.0
Marromeu	22.7	0.3%	82.0	17.7	0.0
Nhamatanda	24.5	0.3%	79.4	20.3	0.0
Both Districts	23.6	0.3%	80.7	19.0	0.0

(&) One family in each district obtained an IFMK score of zero

2.4 Agricultural Extension Assistance

Agricultural extension assistance is usually provided by the National Department of Agriculture. However, in Mozambique the Department of Agriculture is seriously underfunded and understaffed and hence is unable to provide the extension support rural farming families require. A number of non-governmental organizations focussing on the provision of support to the agricultural sector, including FHI/M, are providing assistance through the establishment of an extension network which works together with the DDA to provide extension support to target communities. The 1997 Baseline Survey attempted to find out the effectiveness of existing extension services in the target districts by determining what proportion of the households surveyed received extension assistance, when that assistance was provided and by whom. The results are presented in Tables 81 and 84. Existing extension services appear to be more active in Marromeu than in Nhamatanda, with 50% of households in Marromeu and only 29% of households in Nhamatanda having received extension support (Table 81). This more effective coverage could be attributable to the lower population numbers in Marromeu. It would also appear that the majority of these households received extension assistance during the 1995-6 season, with the percentage of assisted households surveyed falling from 82% in the 1995-6 season to 36% in the 1996-7 season. This drop in extension support was a consequence of a temporary reduction in the size of FHI/M's USAID-funded SPEAR Project and had a greater effect in Marromeu than in Nhamatanda. As shown in Table 82, the majority of assisted households (overall 95% of households in both districts) received extension support from FHI/M extensionists, while the remaining 5% received assistance, principally from the DDA.

Table 81 Percentage of households that received extension assistance and the season during which extension support was provided, by district

District	Households that Received Extension Assistance		
	During any crop season (% of total households)	During the 1996-7 season (% of assisted households)	During the 1995-6 season (% of assisted households)
Marromeu	50	30	85
Nhamatanda	29	47	77
Both Districts	40	36	82

Table 82 Source of extension assistance, as a percentage of the households that received extension assistance, by district

District	Source of Extension Assistance (% of assisted households)			
	FHI/M	DDA (Nhamatanda)	DDA (Marromeu)	Unknown Source
Marromeu	95	0	5	0
Nhamatanda	97	2	0	1
Both Districts	95	1	3	0&

(&) One family in Nhamatanda did not know what organization had provided the extension assistance they received

Households receiving extension assistance receive support by individual farm visits, in extension groups, or in both forms (Table 83) In Marromeu, just over one-third received assistance by individual field visits, the same proportion received assistance in extension groups and one-quarter received assistance in both ways In Nhamatanda, on the other hand, the predominant form of assistance was through extension groups (52% of assisted households), while almost one-quarter of assisted households received assistance by individual field visits and one-quarter both ways Assisted households received between three and four visits per month in both districts, or almost one visit per week This is consistent with the FHI/M target rate for group visits, but is double the rate for individual visits on a bi-monthly basis These findings demonstrate that, to date, farmers in these districts have received intensive extension support from FHI/M The new project hopes to build upon this situation

Table 83 Manner of receiving extension assistance provided by FHI/M and DDA (Nhamatanda), as a percentage of assisted households, and the average number of field visits per month, by district

District	Manner of Receiving Assistance (% of assisted households)			Average Number of Visits per Month (among assisted households)
	By individual field visits	By group	Both ways	
Marromeu	36	39	25	3.4
Nhamatanda	23	52	25	3.6
Both Districts	31	44	25	3.5

The average Improved Farm Management Knowledge Score was calculated for non-assisted households and compared with that of the assisted households, as shown in Table 84 The IFMK score of the assisted households is considerably higher than that of the non-assisted households, with

assisted households using an average of three more improved practices than non-assisted households. There was no apparent difference in the IFMK score between households that had received extension assistance in the year of the survey and those that had received assistance during the 1995-6 season but not the following season. This suggests that farmers who have adopted an improved technique as a consequence of extension training continue to use that practice, even when they are no longer receiving extension support.

Table 84 Average "Improved Farm Management Knowledge" score of non-assisted and assisted households, by district

District	Average Improved Farm Management Knowledge Score									
	Non-Assisted Households		Assisted Households		Households Assisted 1996-7 Season		Households Assisted 1995-6 Season		Households Assisted 1995-6 Season Only	
	IFMKS	#	IFMKS	#	IFMKS	#	IFMKS	#	IFMKS	#
Marromeu	17.9	151	27.5	149	27.9	45	27.8	127	27.1	92
Nhamatanda	21.9	212	30.7	88	31.7	41	31.2	68	31.5	35
Both Districts	20.2	363	29.7	237	29.7	86	29.0	195	28.3	127

2.5 Commercialization and the Role of Farmers Associations

Farmers will only increase their production over the families immediate consumption needs if they are able to commercialize surplus production. The return of peace in Mozambique has enabled farmers to open up sufficient land to meet their families' needs, assuming there are no natural disasters which result in crop losses. However, due to the poorly developed commercial network and transport infrastructure, especially in rural areas, farming families are experiencing difficulties in selling their surplus production. Many farmers sell the majority of their surplus production immediately after harvest. As a result they obtain very low prices for their produce. Most farmers also sell their produce individually and, as a consequence, are not in a position to bargain for a better price. A lack of available information concerning commodity prices in local, district and provincial capital markets and the availability of buyers at these locations, further reduces the farmers ability to maximize the profit he/she can obtain for his/her produce. One of the objectives of the 1997 Baseline Survey, therefore, was to collect more information concerning the commercialization of agricultural produce and the constraints encountered by farming families in the target districts.

Interviewees were asked which family member was responsible for the commercialization of agricultural produce, and the results are presented in Table 85. In Marromeu, the man or both the man and the woman were principally responsible for crop sales (in 92% of households). The woman alone was responsible for sales in 7% of households. In Nhamatanda, the man or both the man and the woman were responsible for crop sales in 70% of households surveyed, with the women being responsible for crop sales in a surprisingly high proportion of households (27%). Interestingly enough, the majority of households in which the female took a lead role in commercialization of agricultural produce (in both districts) were not female-headed households. Of these two-thirds were male-headed households and one-third were female-headed households. The son or daughter was responsible for crop sales in four households. Of these one was a female-headed household and one was headed by an elderly man whose 'son/daughter' was actually an adult! The remaining two were large households headed by men.

Table 85 Person responsible for the sale of agricultural produce, as a percentage of households that sold agricultural produce, by district

District	Person Responsible for Crop Sales (% of households that sold agricultural produce)			
	Man	Woman	Man/Woman	Son/Daughter
Marromeu	46	7	46	1
Nhamatanda	40	27	30	3
Both Districts	43	17	38	2

The reasons why households sold a portion of their agricultural production are given in Table 86. The overwhelming majority of households surveyed in each district said that they sold their produce because they needed money. In Nhamatanda, 15% of households sold produce because buyers were available and in Marromeu, this reason was given by only 4% of households. This situation is quite common in rural areas, where households are reliant on buyers coming into the villages to buy produce. Ten percent of households in Nhamatanda said that they sold produce to take advantage of a good price. A number of households said that they sold produce because they were unable to store this produce. When the production of these families was examined, yields appeared to be low, suggesting that an inability to store their produce may be due to a lack of facilities rather than excess production.

Table 86 Reasons for selling agricultural produce, as a percentage of households that sold a portion of their production following the 1996-7 rainy season's harvest, by district

District	Households that Sold Produce* (% of total)	Reasons for Selling a Portion of Agricultural Production (% of households that sold produce)				
		Needed Money	Buyers Available	Good Price	Unable to Store	Its my Responsibility
Marromeu	27	98	4	0	1	1
Nhamatanda	25	99	15	10	8	12
Both Districts	26	98	9	5	5	7

(*) Households that sold produce after the 1996-7 rainy season represent households selling one or more of the following crops: maize, sorghum, rice, cowpea, pigeon pea, common bean, groundnut, millet, cassava, sunflower and sesame.

The principal problems encountered by producers who sold a portion of their agricultural produce are detailed in Table 87. One-third of households in Marromeu and two-thirds of households in Nhamatanda said that they did not have any problems selling their produce. The relative ease with which farmers in Nhamatanda are able to sell their produce reflects the fact that Nhamatanda is located on the Beira corridor and this district is more easily accessible to traders. The higher degree of accessibility also results in fairer prices, as competition among traders is higher than in the more isolated district of Marromeu. Indeed, a higher proportion of households experienced problems with the price offered by traders in Marromeu than in Nhamatanda (37% and 23%, respectively). Another common problem encountered during commercialization was that the market was very far away. Again this problem was more acute in Marromeu than in Nhamatanda. A lack of transport was more commonly cited by households in Marromeu due to the isolation of this district. Less than 10% of households cited the poor and therefore unacceptable quality of their produce, insufficient production to warrant the sale of a portion of their produce, and the high cost of transport.

A lack of information concerning commodity prices in local, district and provincial markets and the availability of buyers prevents farmers from making the best decisions concerning the sale of their surplus agricultural production. Interviewees were asked where they obtained information concerning market prices and buyers, and the results are presented in Table 88.

Table 87 Problems encountered during the commercialization of field crops, as a percentage of households that sold a portion of their production following the 1996-7 season's harvest, by district

District	Problems Encountered During Commercialization of Field Crops (% of households that sold a portion of their production)							
	No Problems Encountered	Lack of Buyers	Distance to The Market	Poor Product Quality	Insufficient Production	Problems with the Price Offered	Lack of Transport	Cost of Transport
Marromeu	37	17	38	4	7	37	28	5
Nhamatanda	63	8	10	3	4	23	6	6
Both Districts	50	13	25	3	6	31	18	5

Table 88 Sources of market information concerning prices and availability of buyers, as a percentage of households that sold a portion of their production following the 1996-7 season's harvest, by district

District	Source of Market Information (Prices/Buyers) (% of households that sold a portion of their production)						
	Family Member/ Neighbor	Other Sellers	Buyers	Union of Co-operatives	DDA	FHI/M	Source Unknown
Marromeu	46	69	10	0	0	0	1
Nhamatanda	56	63	33	1	1	0	0
Both Districts	51	66	21	1	1	0	1

The most important source of market price and buyer information was other sellers, cited by around two-thirds of the households surveyed in each district. Family members and neighbors were also an important source of information for around one-half of the households surveyed. Buyers are not a reliable and unbiased source of market price information. However, buyers were cited by 10% and 33% of the surveyed households in Marromeu and Nhamatanda, respectively. Due to the greater degree of competition among traders in Nhamatanda, it is more likely that buyers in that district will provide sellers with more accurate price information than they would in Marromeu. Other sources mentioned by a few households were their Association or the Union of Cooperatives and the DDA. Nobody mentioned that they obtained information from the radio, from bulletin boards, from extensionists of FHI/M or other non-governmental organizations, or from private companies operating in the area.

If farmers join together as a farmers association or cooperative, they are able to sell their produce together and in that way, have much greater bargaining power concerning the price obtained for their commodity. The sale of produce in bulk means that transport costs can be shared among members and transport can be arranged upon demand. The 1997 Baseline Survey attempted to determine what proportion of households in the target districts belong to a farmers association or cooperative and what type of activities these associations or cooperatives carry out. As shown in Table 89, only 2% of the interviewees in each district were a member of an association or cooperative. Only 1 out of 5 associations in Marromeu carried out any kind of business activity, while 2 out of 5 associations in Nhamatanda had some kind of business activity. The activities undertaken by these farmers associations are shown in Table 90. The farmers association in Marromeu concentrated on the buying and selling of agricultural produce. One of the associations in Nhamatanda bought and sold agricultural produce as well as carrying out the bulk sale of products produced by its members. The second association processed and sold value-added food products.

Table 89 Percentage of interviewees that were a member of a farmers association or cooperative, and the percentage of associations that run some kind of business activity, among interviewees belonging to an association/co-operative, by district

District	Member of an Association/Co-operative (% of total households)		Does the Association Have Some Kind of Business Activity? (among interviewees belonging to an association/co-operative)					
	%	#	Yes, it does Have		No, it does Not have		Information Not provided	
			%	#	%	#	%	#
Marromeu	2	5	20	1	80	4	0	0
Nhamatanda	2	5	40	2	40	2	20	1
Both Districts	2	10	30	3	60	6	10	1

Table 90 Business activities being undertaken by the farmers association to which interviewees belong, by district

District	Activity Being Undertaken by the Farmers Association(s) or Co-operative(s) (% of associations/co-operatives to which interviewees belong)*					
	Buying and Selling Agricultural Products		Bulk Sale of Products Produced by Members		Processing and Sale Of Food Products	
	%	#	%	#	%	#
Marromeu	100	1	0	0	0	0
Nhamatanda	50	1	50	1	50	1
Both Districts	67	2	33	1	33	1

(*) Some associations/cooperatives undertake activities within more than one category and therefore the total percentage exceeds 100

CONCLUSIONS AND RECOMMENDATIONS

The 1997 Baseline Survey has provided a considerable amount of data for monitoring the progress of the FHI/M's Development Activity Proposal and evaluating its impact. A number of recommendations are worth making, on the basis of these results.

Economic Situation

1 The opportunities for income generation are lower in Marromeu than they are in Nhamatanda. This is largely due to the isolation of this district from neighboring populations. The introduction of income generating activities to target communities in Marromeu would raise income levels. Activities which generate/make available products in demand by the community itself, or neighboring communities, would be most appropriate, as these activities can be sustained even during the rainy season when many transport routes are impassable. Where possible, these activities should be targeted at women as a means of increasing their income earning capacity.

Through small-scale credit activities, entrepreneurs could be assisted in the establishment of small shops or stalls selling manufactured goods, agricultural instruments and seeds. The survey showed that very few households purchase their agricultural instruments and seeds because they are difficult to find. Increased access to manufactured goods would be helpful, particularly during the rainy season when stored food supplies are low and the movement of traders is restricted. Food processing activities, such as baking or cooking snacks, would meet a local demand and does not require inputs obtained from outside the district. FHI/M has already initiated a program to promote the use of oil presses in selected districts of Sofala Province. The relatively high proportion of households in Marromeu growing sesame provides a good starting point for the establishment of small oil processing enterprises. The wider introduction of oil presses would generate a greater interest in oil processing and FHI/M could help stimulate the commercial production of oilseeds by linking oilseed producers with oil press owners. In an initial phase, it may be necessary for FHI/M to guarantee the purchase of oilseeds produced by farmers in the project area. These seeds can be used for resale to developing oil-processing businesses or may be used for demonstration purposes. Other activities that rely on local supplies and may meet a local market are milling for maize, cassava and rice, the production of milk products, bee keeping, and the production/sale of artisan products. In the case of milling, FHI/M would need to provide credit for the purchase of milling equipment by farmers associations or individual entrepreneurs. In the case of artisan production, FHI/M may be able to assist with the identification of specific outlets for the products produced. In communities living along the banks of the River Zambeze, fishing activities could be promoted through the provision of fishing nets and hooks on credit.

Food Security Situation

2 The household production data obtained from the 1997 Baseline Survey suggest that pockets of food insecurity exist in the target districts, particularly in the communities of K. Kaunda, Chueza and Cundue in Marromeu and in the community of Muda in Nhamatanda. It would be advisable to monitor the food security situation in these communities and to provide support if the situation worsens.

Agricultural Situation

3 Households in Nhamatanda grow an average of 2.9 crops during the rainy season, compared to households in Marromeu that plant a more diverse range of crops (average of 4.2 crops). The lower level of crop diversification in Nhamatanda is of concern, as this district has suffered from severe drought, pest attacks and floods in recent years, and therefore could benefit from the spreading of risks afforded by diversification. Although crop diversification has been promoted through the FHI/M

extension program, more effort needs to be made to encourage farmers in Nhamatanda to grow a wider range of crops

4 Farmer-reported yield data and physical yield measurements made in earlier cropping seasons suggest that mono-cropped maize can produce significantly higher yields than inter-cropped maize. This result is largely an effect of differences in maize plant population. The farmer-reported maize yields obtained following the 1996-7 cropping season indicate that inter-cropped fields produced slightly higher yields (overall 0.77 t/ha) than mono-cropped maize fields (0.65 t/ha). For more accurate information, it is necessary to compare physical yield measurements from mono-cropped and inter-cropped maize stands.

5 Baseline Survey crop sales information support the fact that the legumes, particularly common bean and pigeon pea, represent an important potential source of income, as the value per kilogram of these crops is considerably higher than that of the food grains. Farmers should be encouraged to grow these crops, particularly in Nhamatanda, where farmers have relatively easy access to markets and traders.

6 A diverse range of crop storage methods are used by farmers in the target districts. Maize is the most important crop in terms of commercialization. Farmers that intend to store their maize for subsequent sale, must store it in a way that will minimize storage losses, namely on the cob surrounded by the husk. The majority of surveyed households in Nhamatanda (83%) already use this technique, probably because they are aware of the advantages in terms of stored grain quality. However, surprisingly few households in Marromeu (38%) store their maize as cobs with the husk. In fact, 41% stored their maize as grain. Although it would be interesting to find out why farmers in Marromeu often store their maize as grain, it is clearly necessary to promote more appropriate maize storage techniques in that district.

7 The most successful method for bulk storage of agricultural products is a granary with a roof. Weevil attack can be reduced through the regular use of a fire at the base of the granary and the use of rat guards on the legs of the granary reduce storage losses due to rodents. A granary with a roof was used by 57% of households in Nhamatanda, with 38% using a fire. In Marromeu, only 23% of households used a granary with a roof and 22% used a fire. None of these interviewees used rat guards. Further efforts need to be made to demonstrate and promote this technology in project areas. The use of a plastic lining inside a storage container, such as a basket, has been shown to reduce storage losses. This technique was only used by six surveyed households and needs promoting widely.

8 Surprisingly few households (66% in Marromeu and 52% in Nhamatanda) said that they planted seeds saved from a previous harvest. Contrary to expectation, only 79% and 69% of households in these districts, respectively, stored agricultural produce for seeds. This may be because farmers are not aware of appropriate seed storage methods. Indeed, only a small proportion of households mentioned using seed storage techniques, such as storing maize in the husk (as discussed above), hanging cobs or panicles above the cooking fire, or placing seed in jars, pots, or bottles. These methods should be promoted through the extension program, as a way of encouraging farmers to save good quality seeds for subsequent plantings.

9 Very few households in Marromeu (less than 17%) purchased seed, while a slightly higher proportion of households in Nhamatanda (less than 45%) purchased seed. Farmers in Nhamatanda have better access to seed supplies and consequently a larger proportion purchased seed, with 10% travelling to Beira to buy seed. These data suggest that farmers that have access to seeds are probably willing to purchase seed, but that access is limited, particularly in Marromeu. There is clearly a need to increase access to seed, particularly in Marromeu. This is also the only way of ensuring farmers have access to improved varieties. Improved access to seed could be achieved through the extension network, with extensionists selling seed to interested farmers. Alternatively, farmers associations could be used as a conduit for seeds, in which case the association could purchase seed from SEMOC.

or FHI/M, and in turn sell it to interested members of the association or the local community. Increasing access to seeds appears to be particularly important in the case of horticultural crops. A similar system could be established to make agricultural instruments and sacks available to rural communities, particularly in Marroneu.

10 FHI/M does not promote the use of synthetic pesticides. However, the survey showed that a small proportion of rural households are interested in using pesticides and will buy them from local shops or markets if they are available. However, such farmers do not have access to training concerning the most appropriate use of such chemicals. FHI/M should therefore attempt to identify those farmers interested in using chemical products and provide training opportunities on the safe and appropriate use of pesticides.

11 Poultry is quite widely produced in the target districts and it is likely, therefore, that families that are interested in producing chickens would have an opportunity to initiate a flock by obtaining a chick from family members or neighbors. Goats and pigs can represent a particularly important form of livelihood security. Unfortunately, only 26% of households owned pigs and 15% of households owned goats. Goat restocking activities initiated during FHI/M's SPEAR project should be continued, targeting the more vulnerable households and, when possible, female-headed households. Goat restocking should be given priority over pig restocking activities, as goats are less susceptible to epidemics.

12 The level of adoption of environmentally sustainable agricultural practices in the target communities was relatively low. One-half of the households surveyed did not use any field preparation practice and a similar proportion did not use any soil conservation technique. The more widely adopted techniques were related to improved planting practices, such as planting in lines, reducing the number of seeds per hole, inter-cropping cereals with legumes, and reducing the spacing between lines and plants within a line. Eighty percent of households surveyed used less than 10 improved techniques, while the remaining 20% used between 10 and 15 improved techniques. The extension program must continue to concentrate on the promotion of these improved practices. The survey results suggest that households that have adopted an improved technique will continue to use that technique, even when they are no longer receiving extension assistance, suggesting that this approach is sustainable.

Commercialization

13 A number of strategies can be used to encourage farmers in the target districts to participate in local commercial activities. Improved storage techniques should continue to be promoted to ensure that farmers are able to provide a good quality product, even after storage. The collection and dissemination of commodity price information for local, district and provincial markets will allow farmers to decide when and where to sell their produce. This price information can be disseminated through bulletin boards, market price newsletters, or the local radio. By encouraging the formation of farmers associations or cooperatives, and helping to link associations to transporters and traders, it will be possible to help farmers obtain better prices from their products.

APPENDIX 1

Capacity of the Harvest Units Used by Households Surveyed, by Crop

This harvest unit capacity information was used to calculate the amount of produce harvested and sold by each household, on a crop-by-crop basis (presented in Tables 38 and 39)

Crop	Capacity of Each Harvest Unit in Kilogram										
	Kilogram	Sack (50Kg)	Sack (90Kg)	Sack (100Kg)	20 liter Can	Jerry Can ("Galão")	"Serilac" Tin	Pan ("Tigela")	Cup	Heap ("Molho")	Basin ("Bacia")
Maize	-	50	90	100	18	4 5	-	-	-	-	-
Sorghum	-	55	99	-	20	5	-	-	-	-	-
Rice	1	50	90	100	18	4 5	-	-	-	-	-
Cowpea	1	50	90	-	18	4 5	0 9	0 9	-	-	-
Pigeon pea	-	50	90	-	18	4 5	0 9	-	-	-	-
Common bean	1	50	-	-	18	-	-	-	-	-	-
Groundnut	-	50	90	-	18	4 5	0 9	-	-	-	-
Millet	1	55	99	110	20	5	-	-	-	-	-
Cassava	-	50	90	-	18	4 5	-	-	-	0 8	-
Sunflower	-	-	-	-	12 6	-	-	-	-	-	-
Sesame	1	55	99	-	20	5	1	0 9	0 12	-	-
Sweet potato	1	42	75	-	15	4	-	-	-	0 8	5

AGRICULTURE SURVEY

FHI - MOZAMBIQUE

		ORDER NO.
Date of Interview ___/___/___	Reschedule of Interview ___/___/___	
Name of Interviewer	Name of Supervisor	
Name of Town/Area	House No	CLUSTER NO.

NO	QUESTIONS	ANSWERS	GO TO	CODE
1	Name of district	1 Nhamatanda 2 Marromeu		
2	Name of community	1 Ramos 2 Micuzi 3 Xiluvu 4 Metuchira Lomaco 5 Nharuchonga 6 Tica 7 Jasse 8 Muda 9 Lamego 10 Bauaze 11 Safrique A-E 12 Safrique F-L 13 Kenneth Kaunda 14 Nensa 15 Cundue 16 Megugune 17 Vila Nova Salone 18 Chueza C		
3	Does the family of this house have an agriculture field?	1 Yes 2 No----->	Do not continue	
4	Who answers the questionnaire?	1 Chief (man) 2 Chief woman) 3 Chief's wife 4 Both man and woman 5 Other adult (female)(> 20 years) 6 Other adult (male)(> 20 years)		

5 Mention the relationship with the head of this house, sex, age and primary and secondary activities for all members of this house Start with the head and wife of this house, on the first 2 lines (if applicable)

Names Any person that usually eats at this house	Relationship with head of the family 1 Chief 2 Husband/Wife 3 Son/Daughter 4 Mother/Father 5 Other family 6 Other (specify)	Sex 1 Masculine 2 Feminine	Age (years) 1 less than 10 2 more than 55 3 bwt 10 & 55	During these past 12 months, has this person contributed to family expenses through some kind of economic activity? (eg selling drinks, charcoal, carpentary, fields)	During these past 12 months, has this person contributed to family expenses by selling his/her labor externally? (eg working in the neighbour's field, or in a company, or a factory, or as a teacher etc)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

74

No	QUESTIONS	ANSWERS	GO TO	CODE		
6	How many houses does the family own?	0 Does not know Specify -----				
7	What material is the roof of the main house made of?	1 Grass or other natural material, 2 Zinc/asbestos 3 Plastic/canvas 9 Other (specify) -----				
8	What material was used in the construction of the main house?	1 Stakes/mud covering 2 Mud blocks 3 Cement block or brick (burnt mud block) 4 Bamboo and stakes 5 Reeds 9 Other (specify) -----				
9	What is the door of the main house made of?	0 Does not have 1 Wood 2 Cloth 3 Bamboo and reeds 4 Drum sheets 5 Straw mat 9 Other (specify) -----				
10	Has the family bought new clothes in the past 12 months? (interviewer do not include used clothes or wrap arounds, only new clothes)	1 Yes 2 No				
11	Did the family buy any meat in the past 12 months?	1 Yes 2 No				
12	Did the family receive any goods in the past 12 months? (eg Did family members or neighbours give money or other goods (clothes, food) to this family? Do not include donations)	1 Yes 2 No				
13	Did you sell maize in the past 12 months?	1 Yes 2 No				
14	Animals, production tools and other goods that the family has? Indicate the quantity					
	Animal	Quantity	Tool	Quantity	Goods	Quantity
	1 Chickens/ducks		1 Hoes		1 Sewing machines	
	2 Pigs		2 Machetes		2 Wooden tables	
	3 Rabbits		3 Axes		3 Beds and chairs	
	4 Goats		4 Shovels		4 Bicycles	
	5 Oxes		5 Racks		5 Motorbikes	
	6 Donkeys		6 Sickles		6 Radios	
			7 Files		7 Matresses	
			8 Animal traction plow			

15

NO	QUESTIONS					ANSWERS	GO TO	CODE		
15	How many fields did the family cultivate during the first season of the year?					0 Does not know Specify -----				
16	In the first season of the year, what crops were cultivated?	Intercrop with other Crop	Size of Field(s) cultivated?	Quantity Harvested?	How did your Production in this Season Compare with the previous one?	What is the Quantity you lost in the Field?	Did you sell in this 1st season?	What was the Quantity Sold and at What Price in Total?		
	1 Yes 2 No	1 Yes 2 No 77 Not applicable		(* Please see codes at bottom of page) If code is 12 specify write the crop measurements on the following lines _____ _____	0 does not know 1 did not harvest 2 same 3 more 4 less 77 not applicable	0 does not know 1 none 2 a little/less than 1/4 3 about a 1/4 4 half 5 about 3/4 6 btw 3/4 and all 7 all 77 not applicable	1 Yes 2 No 3 Does not know 77 Not applicable # (instructions under mentioned)	(* Please see codes at bottom of page) If code is 12 other (specify) write the crop and measurements on the following lines _____ _____		
				Quant	Code			Quant	Code	Price per Code
	Maize		ha m2							
	Sorghum		ha m2							
	Rice		ha m2							
	Cowpeas		ha m2							
	Pigeon Peas		ha m2							
	Common Beans		ha m2							
	Groundnuts		ha m2							
	Millet		ha m2							
	Cassava		ha m2							
	Sunflower		ha m2							
	Sesame		ha m2							

* 0 does not know , 1 kg , 2 bag (50kg) , 3 bag (90kg) , 4 tin (20 litres/18kg) , 5 gallon (4 5kg) , 6 serlac , 7 basins , 8 cups (sesame/sunflower) , 9 bunch , 10 head , 11 basin , 12 other (specify) , 77 Not applicable ,

If you indicated 2 No or 3 Does not know
77 Not applicable, Go To 21
If you indicated 1 Yes Go To 17

16

NO	QUESTIONS	ANSWERS	GO TO	CODE
17	What problems did you have in selling?	(Do not read the alternatives)		
	0 None	1 Yes 2 No		
	1 No buyers	1 Yes 2 No		
	2 The market is far away	1 Yes 2 No		
	3 Low quality product	1 Yes 2 No		
	4 No production	1 Yes 2 No		
	5 Price problem	1 Yes 2 No		
	6 No transport	1 Yes 2 No		
	7 Cost of transportation	1 Yes 2 No		
	9 Other (specify)			
18	Why did you sell your products?	(Do not read the alternatives)		
	1 Needed the money	1 Yes 2 No		
	2 Availability of buyers	1 Yes 2 No		
	3 Good price	1 Yes 2 No		
	4 Could not store	1 Yes 2 No		
	5 It is your activity/reponsibility	1 Yes 2 No		
	9 Other (specify)			
19	Who is responsible for the sale?	1 Man 2 Woman 3 Both 4 Son/daughter		
20	How do you obtain market information (prices, buyers)?	(Do not read the alternatives)		
	1 Does not know	1 Yes 2 No		
	2 Neighbour/family	1 Yes 2 No		
	3 Other sellers	1 Yes 2 No		
	4 Radio	1 Yes 2 No		
	5 Bulletin Boards	1 Yes 2 No		
	6 From buyers	1 Yes 2 No		
	7 Association/union	1 Yes 2 No		
	8 Government (DDA)	1 Yes 2 No		
	9 Company	1 Yes 2 No		
	10 FHI	1 Yes 2 No		
	11 Other NGO's, (ADPP, GTZ)	1 Yes 2 No		
	12 Other (specify)			

NO	QUESTIONS	ANSWERS	GO TO	CODE
21	At field level, what problems did you have with your production?	(Do not read the alternatives)		
	0 does not know	1 Yes 2 No		
	1 termites	1 Yes 2 No		
	2 weevils/insects	1 Yes 2 No		
	3 rats	1 Yes 2 No		
	4 monkeys	1 Yes 2 No		
	5 thieves	1 Yes 2 No		
	6 rains/floods	1 Yes 2 No		
	7 stalkborer	1 Yes 2 No		
	8 birds	1 Yes 2 No		
	9 grasshoppers/locust	1 Yes 2 No		
	10 diseases	1 Yes 2 No		
	11 weeds	1 Yes 2 No		
	12 drought	1 Yes 2 No		
	13 burnt land	1 Yes 2 No		
	14 strong winds	1 Yes 2 No		
	15 other (specify)			

NO	QUESTIONS				ANSWERS	GO TO	CODE
22	In the last 12 months, did you store any of the following products to sell or consume later?				1 yes 2 no ---->	24	
23	Which products did you store?	How long did you store it for? (in months)	After storing, how do you use the product?	What quantity of the stored product did you lose?	What problems did you have?	What was the main system you used to store?	In what form was your maize stored?
	1 Yes 2 No	77 Not applicable Number of months (underneath)	1 to consume 2 to sell 3 to feed animals 4 to give other people 5 store the seed for next season 9 other (specify crop and other usage) _____ - _____	0 does not know 1 none 2 a little/ less than a 1/4 3 about a 1/4 4 half 5 about 3/4 6 between 3/4 and all 7 all 77 not applicable	0 none 1 termites 2 weevils/insects 3 rats 4 thieves 5 rain/floods 6 diseases/fungus 7 rotting 9 other (specify) Specify crop and problem _____ - _____ _____ - _____	0 none 1 granary with roof 2 granary without roof 3 baskets 4 clay pots and jars 5 smoke 6 bags 7 shelf 8 in the main house 9 plastic liner 10 rat protectors 11 hanging 12 other (specify) ----- _____	1 in grain 2 in cobs with husks 3 in cobs without husks 4 in flour 9 other (specify) ----- 77. Not applicable
	Maize	_____ months					
	Sorghum	_____ months					
	Rice	_____ months					
	Cowpeas	_____ months					
	Groundnuts	_____ months					
	Millet	_____ months					
	Cassava	_____ months					
	Sweet Potato	_____ months					
	Sunflower	_____ months					
	Sesame	_____ months					

16

NO	QUESTIONS		ANSWERS		GO TO	CODE		
24	Did you cultivate any horticulture crops this year?		1 Yes 2 No ----->		26			
25	Crop	Size(s) of Field(s) cultivated	Quantity Harvested	To Consume	To Sell	Quantity and Price sold in total?		
	1 Yes 2 No		(* Please see codes at bottom of page) If code is 12 other (specify) write the crop and measurement in the following lines _____ _____	1 Yes 2 No 77 Not applicable	1 Yes 2 No 77 Not applicable If No, go to 26	(* Please see codes at bottom of page) If code is 12 other (specify) write the crop and measurement in the following lines _____ _____		
			Quant	Code		Quant	Code	Price per Code
	Onion	ha m2						
	Cabbage (couve)	ha m2						
	Cabbage	ha m2						
	Tomato	ha m2						
	Garlic	ha m2						
	Sweet Potato	ha m2						
	Pumpkin	ha m2						
	Lettuce	ha m2						
	Carrot	ha m2						
	Pepper	ha m2						
	Piri-Piri	ha m2						
	Other -----	ha m2						

* 0 does not know , 1 kg , 2 bag (50kg) , 3 bag (90kg) , 4 tin (20 litres/18kg) , 5 gallon (4 5kg) , 6 serilac , 7 small basins , 8 cups (sesame/sunflower) , 9 bunch , 10 head , 11 basin , 12 other (specify) , 77 Not applicable ,

20

NO	QUESTIONS	POS	ANSWERS	GO TO	CODE
26	Are you a member of an association or agriculture cooperative?	1 Yes 2 No ----->		29	
27	Does your association have a business?	1 Yes 2 No -----> 3 Does not know ----->		29 29	
28	What is the business of your association?	(Do not read the alternatives)			
	1 Buying and selling agriculture and forest products from members or other people (eg local oil/charcoal/coconut/animals)	1 Yes	2 No		
	2 Buying and selling manufactured products (eg industrial oil/clothing/cigarettes/biscuits)	1 Yes	2 No		
	3 Selling seeds and agriculture tools	1 Yes	2 No		
	4 Selling products together with the members of the association	1 Yes	2 No		
	5 Selling construction products	1 Yes	2 No		
	6 Bakery	1 Yes	2 No		
	7 Processing and selling food (oil/milling)	1 Yes	2 No		
	8 Processing and selling of drinks (eg Traditional alcoholic beverages)	1 Yes	2 No		
	9 Carpentry	1 Yes	2 No		
	10 Crafts	1 Yes	2 No		
	11 Livestock/animal traction	1 Yes	2 No		
	12 Tinsmith	1 Yes	2 No		
	13 Other (specify)				
29	Do you have a business?	1 Yes 2 No ----->		If 29 & 30 are No,	
30	Do you work for someone that has a business?	1 Yes 2 No ----->		Go to 32	
31	What type of business is it?	(Do not read the alternatives)			
	1 Buying and selling agriculture and forest products from members or other people (eg local oil/charcoal/coconut/animals)	1 Yes	2 No		
	2 Buying and selling manufactured products (eg industrial oil/clothing/cigarettes/biscuits)	1 Yes	2 No		
	3 Selling seeds and agriculture tools	1 Yes	2 No		
	4 Selling construction products	1 Yes	2 No		
	5 Bakery	1 Yes	2 No		
	6 Processing and selling food (oil/milling)	1 Yes	2 No		
	7 Processing and selling drinks (eg Traditional alcoholic beverages)	1 Yes	2 No		
	8 Carpentry	1 Yes	2 No		
	9 Crafts	1 Yes	2 No		
	10 Live stock/animal traction	1 Yes	2 No		
	11 Tinsmith	1 Yes	2 No		
	12 Other (specify)				

NO	QUESTIONS	ANSWERS	GO TO	CODE
32	How did you get seeds in the last 12 months? (Do not read the alternatives)	0 did not get-----> 1 bought/exchanged 2 donated 3 both 4 stored ----->	If it is only 0 or 4 go to 34	
33	Who supplied the seeds? 0 does not know 1 neighbour/family 2 church 3 shop or local market 4 shop in Beira 5 FHI Research station at Lamego 6 government (DDA) 7 SEMOC 8 ORAM 9 your association 10 Mocambique Industrial 11 PMA 12 Other ONG 13 Other (specify)	(Do not read the alternatives) 1 Yes 2 No 1 Yes 2 No		
34	How did you get agriculture tools in the last 12 months? (Do not read the alternatives)	0 did not get-----> 1 bought/exchanged 2 donated 3 both 4 made ----->	If it is only 0 or 4 go to 36	
35	Who supplied the agriculture tools? 0 does not know 1 neighbour/family 2 church 3 shop or local market 4 shop in Beira 5 FHI Research station at Lamego 6 government (DDA) 7 SEMOC 8 ORAM 9 your association 10 Mocambique Industrial 11 PMA 12 Other ONG 13 Other (specify)	(Do not read the alternatives) 1 Yes 2 No 1 Yes 2 No		
36	Which agricultural inputs do you use? (Read the alternatives) 1 none 2 does not know 3 improved seeds 4 chemical products 5 various bags 6 tools 7 other (specify)	1 Yes 2 No 1 Yes 2 No		
37	Did this family receive any aid from a company during this year for the production of cash crop?	1 Yes - Crop _____ 2 No----->	39	
38	Did the company guarantee to buy the production of this crop?	1 Yes 2 No		

NO.	QUESTIONS	ANSWERS	GO TO	CODE
39	This year, what practices did you follow in your fields?			
	Preparation of land			
	1 Do you burn the land before you plant	1 Yes 2 No 3 Does not know		
	2 Do you leave trees on the field	1 Yes 2 No 3 Does not know		
	3 Do you incorporate organic material before you plant	1 Yes 2 No 3 Does not know		
	Planting			
	1 Do you use improved seeds	1 Yes 2 No 3 Does not know		
	2 Do you select seed at field level	1 Yes 2 No 3 Does not know		
	3 Do you test your seeds for germination before you plant	1 Yes 2 No 3 Does not know		
	4 Do you plant in rows	1 Yes 2 No 3 Does not know		
	5 Do you reduce spacing between lines and plants in maize	1 Yes 2 No 3 Does not know		
	6 Do you reduce the number of seeds per hole	1 Yes 2 No 3 Does not know		
	Intercropping and Rotation of Crops			
	1 Do you do rotation of crops	1 Yes 2 No 3 Does not know		
	2 Do you do intercropping of maize and groundnuts	1 Yes 2 No 3 Does not know		
	3 Do you do intercropping of maize and cowpea	1 Yes 2 No 3 Does not know		
	4 Do you do intercropping of maize and sorghum or millet	1 Yes 2 No 3 Does not know		
	5 Do you do intercropping of sorghum and millet	1 Yes 2 No 3 Does not know		
	Pests			
	1 Do you prepare homemade medicine to fight pests	1 Yes 2 No 3 Does not know		
	2 Do you use traps or barriers to control pests	1 Yes 2 No 3 Does not know		
	Control of Erosion			
	1 Do you use grass barriers, tree trunks, or stones to control erosion	1 Yes 2 No 3 Does not know		
	2 Do you use shrubs (live fencing) to control erosion	1 Yes 2 No 3 Does not know		
	3 Do you do contours on the field	1 Yes 2 No 3 Does not know		
	4 Do you use mulching cover	1 Yes 2 No 3 Does not know		
	5 Do you plant trees in the field	1 Yes 2 No 3 Does not know		
	Soil Fertility			
	1 Do you prepare organic compost	1 Yes 2 No 3 Does not know		
	2 Do you use animal manure	1 Yes 2 No 3 Does not know		
	3 Do you use green manure	1 Yes 2 No 3 Does not know		
	Post-Harvest.			
	1 Do you plan your production	1 Yes 2 No 3 Does not know		
	Agriculture Inputs			
	1 Do you use a pump irrigation system	1 Yes 2 No 3 Does not know		
	2 Do you use chemical pesticides/herbicides/insecticides	1 Yes 2 No 3 Does not know	} 1 --- > 40 } 2 or 3 ----- > 42	
	3 Do you use chemical fertilizer	1 Yes 2 No 3 Does not know		
40	Where did you get chemical fertilizer or chemical pesticide/ herbicide/insecticide?			
	0 does not know	1 Yes 2 No		
	1 local shops/markets	1 Yes 2 No		
	2 shops in Beira	1 Yes 2 No		
	3 donations/presents	1 Yes 2 No		
	4 neighbour/family	1 Yes 2 No		
	5 Lamego research station	1 Yes 2 No		
	6 government DDA	1 Yes 2 No		
	7 church	1 Yes 2 No		
	9 other (specify)			
41	If you received chemical products, did you have any training on how to use it?	1 Yes 2 No 3 Does not know		

NO	QUESTIONS	ANSWERS	GO TO	CODE
42	Did you receive agriculture extension assistance?	1 Yes 2 No----->	Finished	
43	During this year?	1 Yes 2 No 3 Does not know		
44	During last year?	1 Yes 2 No 2 Does not know		
45	Who did you receive assistance from?	0 Does not know/ remember 1 FHI -----> 2 DDA (Nhamatanda) -----> 3 DDA (Marromeu) 4 GTZ 5 ADPP 6 Papir 7 Church 8 Amai Apa Banda 9 Other (specify) -----	46 46	
46	How did you receive extension assistance from FHI?	1 Individual visits 2 Group visits 3 Both		
47	How many times per month are you visited by the extensionist?	0 Does not know 1 Once 2 Twice 3 Three times 4 Four times 5 More than 4 times		

INQUÉRITO DE AGRICULTURA

FHI - MOCAMBIQUE

		NO. DE ORDEM:	
Data da Entrevista ____ / ____ / ____		Remarcação da Entrevista ____ / ____ / ____	
Nome do Entrevistador		Nome do Supervisor	
Nome da Aldeia/Bairro	Casa No	CLUSTER NO.	

NO	PERGUNTAS	RESPOSTAS	VÁ PARA	CODIGO
1	Nome do distrito	1 Nhamatanda 2 Marromeu		
2	Nome da comunidade	1 Ramos 2 Micuzi 3 Xiluvu 4 Metuchira Lomaco 5 Nharuchonga 6 Tica 7 Jasse 8 Muda 9 Lamego 10 Bauaze 11 Safrique A-E 12 Safrique F-L 13 Kenneth Kaunda 14 Nensa 15 Cundue 16 Megugune 17 Vila Nova Salone 18 Chueza C		
3	A família desta casa tem uma machamba?	1 Sim 2 Não----->	Não Continue	
4	Quem responde ao questionário?	1 Chefe (homen) 2 Chefe (mulher) 3 Esposa do chefe 4 Ambos homem e mulher 5 outro adulto (femenino) (mais de 20 anos) 6 outro adulto (masculino) (mais de 20 anos)		

5 Mencione o grau de parentesco com o chefe desta casa, sexo, idade, e actividades primárias e secundárias para todos os membros desta casa Comece com o chefe desta casa e a esposa (se aplicável) nas primeiras duas linhas

Nomes Qualquer pessoa que costuma comer nesta casa	Grau de Parentesco com o Chefe de Família 1 Chefe 2 Esposo/a 3 Filho/a 4 Pai/mãe 5 Outro familiar 6 Outro (especificar)	Sexo 1 Masculino 2 Femenino	Idade (anos) 1 menos de 10 2 mais de 55 3 entre 10 e 55	Durante os últimos 12 meses esta pessoa tem contribuído para a renda familiar fazendo alguma actividade económica por conta própria? (ex venda de bebida, carvão, carpintaria, machambas)	Durante os últimos 12 meses esta pessoa tem contribuído para a renda familiar vendendo a sua mão-de-obra fora da machamba? (ex trabalhando na machamba do vizinho, ou da companhia, ou na fábrica, professor etc)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

No	PERGUNTAS	RESPOSTAS	VÁ PARA	CÓDIGO		
6	Quantas casas a família tem?	0 Não sabe Especifique -----				
7	O teto da casa principal é de que material?	1 Capim ou outro material natural 2 Zinco/lusalite 3 Plástico/lona 9 Outro (especificar) -----				
8	Qual é o material que usou na construção da casa principal?	1 Pau a pique/rebocada 2 Bloco de matope 3 Bloco de cimento ou tijolo (bloco de matope queimado) 4 Bambú e estacas 5 Caniços 9 Outro (especificar) -----				
9	A porta da casa principal é de que material?	0 Não tem 1 Madeira 2 Tecido/capulana 3 Bambú ou canico 4 Chapas de tambor 5 Esteira 9 Outro (especificar) -----				
10	A família comprou roupa nova durante os últimos 12 meses? (Inqueridor não inclua roupa usada ou capulana, só roupa nova)	1 Sim 2 Não				
11	A família comprou carne durante os últimos 12 meses?	1 Sim 2 Não				
12	A família recebeu remessas durante os últimos 12 meses? (ex Os membros da família ou vizinhos ou amigos dão dinheiro ou outras coisas (roupas, alimentação) a esta família Não inclua doações)	1 Sim 2 Não				
13	Vendeu milho alguma vez nos últimos 12 meses?	1 Sim 2 Não				
14	Animais, instrumentos de produção e outros bens que a família possui? Indicar a quantidade					
	Animal	Quantidade	Instrumento	Quantidade	Bens	Quantidade
	1 Galinhas/patos		1 Enxadas		1 Máquinas de costura	
	2 Porcos		2 Catanas		2 Mesas de madeira	
	3 Coelhos		3 Machados		3 Camas de madeira	
	4 Cabritos		4 Pás		4 Bicicletas	
	5 Bois		5 Ancinhos		5 Motorizadas	
	6 Burros		6 Foices		6 Rádios	
			7 Limas		7 Colchões	
			8 Charruas de traccão animal			

NO	PERGUNTAS					RESPOSTAS	VÁ PARA	CÓDIGO		
15	Quantas machambas a família cultivou durante a primeira época do ano?					0 Não sabe Especificar -----				
16	Na primeira época do ano, quais culturas cultivou?	Consociação com outra Cultura	Medida da(s) Machamba(s) onde cultiva?	Que Quantidade Colheu?	Mudou a sua Produção nesta 1ª época e qual é a comparação com a época anterior?	Qual a quantidade de Produção que Perdeu no Campo?	Vendeu alguma vez nesta 1ª época?	Que Quantidade e Preço Vendeu em Total?		
	1 Sim 2 Não	1 Sim 2 Não 77 Não aplicável		(* Favor ver código em baixo) Se o código é 12 outro (especificar) escreva a cultura e a medida nas seguintes linhas _____ _____	0 não sabe 1 não colheu 2 mesmo 3 mais 4 menos 77 não aplicável	0 não sabe 1 nenhuma 2 um pouco/ menos de 1/4 3 cerca de 1/4 4 metade 5 cerca de 3/4 6 entre 3/4 e toda 7 toda 77 não aplicável	1 Sim 2 Não 3 Não sabe 77 Não aplicável # (instruções em baixo)	(* Favor ver código em baixo) Se o código é 12 outro (especificar) escreva a cultura e a medida nas seguintes linhas _____ _____		
				Quant	Código			Quant	Código	Preço por Código
	Milho		ha m2							
	Mapira		ha m2							
	Arroz		ha m2							
	Feijão Nhemba		ha m2							
	Feijão Boer		ha m2							
	Feijão Manteiga		ha m2							
	Amendoim		ha m2							
	Maxoeira		ha m2							
	Mandioca		ha m2							
	Girassol		ha m2							
	Gergelim		ha m2							

* 0 não sabe , 1 kg , 2 saco (50kg) , 3 saco (90kg) , 4 lata (20 litros/18kg) , 5 galão (4 5kg) , 6 serilac , 7 tigelas , 8 copos (gergelim/girassol) , 9 molho , 10 cabeça , 11 bacia , 12 outro (especificar) , 77 Não aplicavel ,

Se indicou 2 Não 3 Não sabe ou 77 Não aplicável, Vá Para 21
Se indicou 1 Sim Vá Para 17

NO	PERGUNTAS	RESPOSTAS	VÁ PARA	CÓDIGO
17	Que problemas de venda tem você?	(Não leia as alternativas)		
	0 Não tem	1 Sim 2 Não		
	1 Falta de compradores	1 Sim 2 Não		
	2 Mercado fica distante	1 Sim 2 Não		
	3 Falta de qualidade de produto	1 Sim 2 Não		
	4 Falta de produção	1 Sim 2 Não		
	5 Problemas de preço	1 Sim 2 Não		
	6 Não tem transporte	1 Sim 2 Não		
	7 Custo de transportaçã	1 Sim 2 Não		
	9 Outro (especificar)			
18	Porque é que vendeu os seus produtos?	(Não leia as alternativas)		
	1 Precisava de dinheiro	1 Sim 2 Não		
	2 Compradores disponíveis	1 Sim 2 Não		
	3 Bom preço	1 Sim 2 Não		
	4 Não podia armazenar	1 Sim 2 Não		
	5 Sua actividade	1 Sim 2 Não		
	9 Outro (especificar)			
19	Quem é responsável pelas vendas?	1 Homen 2 Mulher 3 Ambos 4 Filho/filha		
20	Como obtem a informação de mercado (preços, compradores)?	(Não leia as alternativas)		
	1 Não sabe	1 Sim 2 Não		
	2 Vizinho/família	1 Sim 2 Não		
	3 Outros vendedores	1 Sim 2 Não		
	4 Rádio	1 Sim 2 Não		
	5 Jornal do povo	1 Sim 2 Não		
	6 Compradores disponíveis	1 Sim 2 Não		
	7 Associação/união	1 Sim 2 Não		
	8 Governo (DDA)	1 Sim 2 Não		
	9 Companhia	1 Sim 2 Não		
	10 FHI	1 Sim 2 Não		
	11 Outros ONG, (ADPP, GTZ)	1 Sim 2 Não		
	12 Outro (especificar)			

NO	PERGUNTAS				RESPOSTA	VÁ PARA	CÓDIGO
22	Durante o ano passado armazenou alguns dos seguintes produtos para vender ou comer mais tarde?				1 sim 2 não ----->	24	
23	Quais são os Produtos que Armazenou?	Por Quanto Tempo Armazenou? (em meses)	Depois do Armazenamento como Utiliza o Produto?	Qual a Quantidade de Produto Armazenado Perdido?	Que Problemas teve?	Que Sistema Principal de Armazenamento Utilizou?	Como Armazenou o seu Milho?
	1 Sim 2 Não	77 Não aplicável Número de meses (em baixo)	1 para comer 2 para vender 3 para alimentar os animais 4 dar a outras pessoas 5 guardou as sementes para a próxima época 9 outro (especificar cultura e outro uso) _____ - _____	0 Não sabe 1 nenhuma 2 um pouco/ menos de 1/4 3 cerca de 1/4 4 metade 5 cerca de 3/4 6 entre 3/4 e toda 7 toda 77 não aplicável	0 Não teve 1 muçhem/termite 2 gorgulhos/insectos 3 ratos 4 ladrões 5 chuvas/cheias 6 doenças/fungos 7 apodreceu 9 outro (especificar) Especificar cultura e problema _____ - _____ _____ - _____	0 não tem 1 celeiro com teto 2 celeiro sem teto 3 cestos 4 nas bilhas ou panelas de barro 5 fumo 6 sacos 7 chidade/estante 8 na casa principal 9 forro de plástico 10 protectores de ratos 11 pendura 12 outro (especificar) ----- _____	1 em grão 2 em espiga com camisas 3 em espigas sem camisas 4 em farinha 9 outro (especificar) ----- 77 Não aplicável
	Milho	meses					
	Mapira	meses					
	Arroz	meses					
	Feijao Nhemba	meses					
	Amendoim	meses					
	Maxoeira	meses					
	Mandioca	meses					
	Batata Doce	meses					
	Girassol	meses					
	Gergelim	meses					

20

NO	PERGUNTA		RESPOSTA		VÁ PARA	CÓDIGO		
24	Cultivou hortícolas este ano?		1 Sim 2 Não ----->		26			
25	Cultura	Medida da(s) Machamba(s) onde Cultiva	Que Quantidade Colheu?	Para Consumir	Para Vender	Que Quantidade e Preço Vendeu em Total?		
	1 Sim 2 Não		(* Favor ver código em baixo) Se o código é 12 outro (especificar) escreve a cultura e a medida nas seguintes linhas _____ _____	1 Sim 2 Não 77. Não aplicável	1 Sim 2 Não 77 Não aplicável Se Não, vá para 26	(* Favor ver código em baixo) Se o código é 12 outro (especificar) escreve a cultura e a medida nas seguintes linhas _____ _____		
			Quant	Código		Quant	Código	Preço por Código
	Cebola	ha m2						
	Couve	ha m2						
	Repolho	ha m2						
	Tomate	ha m2						
	Alho	ha m2						
	Batata Doce	ha m2						
	Abóbora	ha m2						
	Alface	ha m2						
	Cenoura	ha m2						
	Pimento	ha m2						
	Piri-Piri	ha m2						
	Outro -----	ha m2						

* 0 não sabe , 1 kg , 2 saco (50kg) , 3 saco (90kg) , 4 lata (20 litros/18kg) , 5 galão (4 5kg) , 6 serilac , 7 tigelas , 8 copos (gergelim/grassol) , 9 molho , 10 cabeça , 11 bacia , 12 outro (especificar) , 77 Não aplicavel ,

91

NO	PERGUNTAS	RESPOSTAS	VÁ PARA	CODIGO
26	Você é um membro duma associação ou cooperativa agrícola?	1 Sim 2 Não ----->	29	
27	A sua associação tem algum negócio?	1 Sim 2 Não -----> 3 Não sabe ----->	29 29 29	
28	Qual e o negócio da sua associação?	(Não leia as alternativas)		
	1 Compra e venda de produtos agrícolas e florestais dos membros ou outras pessoas (ex óleo local/carvão/côco/animais)	1 Sim 2 Não		
	2 Compra e venda de produtos manufacturados (ex óleo industrial/roupas/cigarros/bolachas)	1 Sim 2 Não		
	3 Venda de sementes e utensílios agrícolas	1 Sim 2 Não		
	4 Venda de produtos juntamente dos membros da associação	1 Sim 2 Não		
	5 Venda de produtos de construção	1 Sim 2 Não		
	6 Padaria	1 Sim 2 Não		
	7 Processamento e venda de comidas (óleo/moagem)	1 Sim 2 Não		
	8 Processamento e venda de bebidas (ex nipa)	1 Sim 2 Não		
	9 Carpintaria	1 Sim 2 Não		
	10 Artesanato	1 Sim 2 Não		
	11 Pecuária agrícola/tracção animal	1 Sim 2 Não		
	12 Latoaria	1 Sim 2 Não		
	13 Outro (especificar)			
29	Você tem algum negócio?	1 Sim 2 Não ----->	Se 29 e 30 são Não,	
30	Você trabalha para alguém que tem um negócio?	1 Sim 2 Não ----->	Vá para 32	
31	Que tipo de negócio é?	(Não leia as alternativas)		
	1 Compra e venda de produtos agrícolas ou florestais de outras pessoas (ex óleo local/carvão/côco/animais)	1 Sim 2 Não		
	2 Compra e venda de produtos manufacturados (ex óleo industrial/roupas/cigarros/bolachas)	1 Sim 2 Não		
	3 Venda de sementes e utensílios agrícolas	1 Sim 2 Não		
	4 Venda de produtos de construção	1 Sim 2 Não		
	5 Padaria	1 Sim 2 Não		
	6 Processamento e venda de comidas (óleo/moagem)	1 Sim 2 Não		
	7 Processamento e venda de bebidas (ex nipa)	1 Sim 2 Não		
	8 Carpintaria	1 Sim 2 Não		
	9 Artesanato	1 Sim 2 Não		
	10 Pecuária agrícola/tracção animal	1 Sim 2 Não		
	11 Latoaria	1 Sim 2 Não		
	12 Outro (especificar)			

NO	PERGUNTAS	RESPOSTAS	VÁ PARA	CÓDIGO
32	Como obteve sementes nos últimos 12 meses? (Não leia as alternativas)	0 não obteve-----> 1 comprou/trocou 2 recebeu gratuitamente 3 ambos 4 guardou ----->	Se é só 0 ou 4 vá para 34	
33	Quem forneceu as sementes? 0 não sabe 1 vizinho/família 2 igreja 3 loja ou mercado local 4 loja na Beira 5 estação de investigação de Lamego/FHI 6 governo (DDA) 7 SEMOC 8 ORAM 9 sua associação 10 Mocambique Industrial 11 PMA 12 Outra ONG 13 Outro (especificar)	(Não leia as alternativas) 1 Sim 2 Não 1 Sim 2 Não		
34	Como obteve utensílios agrícolas nos últimos 12 meses? (Não leia as alternativas)	0 não obteve-----> 1 comprou/trocou 2 recebeu gratuitamente 3 ambos 4 fez ----->	Se é so 0 ou 4 vá para 36	
35	Quem forneceu os utensílios agrícolas? 0 não sabe 1 vizinho/família 2 igreja 3 loja ou mercado local 4 loja na Beira 5 estação de investigação de Lamego/FHI 6 governo (DDA) 7 SEMOC 8 ORAM 9 sua associação 10 Mocambique Industrial 11 PMA 12 Outra ONG 13 outro (especificar)	(Não leia as alternativas) 1 Sim 2 Não 1 Sim 2 Não		
36	Quais insumos agrícolas você utiliza? (Leia as alternativas) 1 nenhum 2 não sabe 3 sementes melhoradas 4 produtos químicos 5 varios sacos 6 utensílios 7 outro (especificar)	1 Sim 2 Não 1 Sim 2 Não		
37	A família recebeu fomento de alguma empresa durante este ano para a produção de uma cultura de rendimento?	1 Sim - Cultura _____ 2 Não----->	39	
38	A empresa garante a compra desta cultura de rendimento?	1 Sim 2 Não		

NO	PERGUNTAS	RESPOSTAS	VÁ PARA	CODIGO
39	Você faz as seguintes práticas nas suas machambas este ano?			
	Preparação das terras.			
	1 Queima as terras antes de semear	1 Sim 2 Não 3 Não sabe		
	2 Deixa árvores na machamba	1 Sim 2 Não 3 Não sabe		
	3 Incorpora matéria orgânica antes de semear	1 Sim 2 Não 3 Não sabe		
	Sementeiras			
	1 Usa sementes melhoradas	1 Sim 2 Não 3 Não sabe		
	2 Faz selecção da semente a nível de campo	1 Sim 2 Não 3 Não sabe		
	3 Testa a sua semente para germinação antes de semear	1 Sim 2 Não 3 Não sabe		
	4 Semeia milho em linhas	1 Sim 2 Não 3 Não sabe		
	5 Reduz o espaço entre linhas e plantas de milho	1 Sim 2 Não 3 Não sabe		
	6 Reduz o número de sementes por cova	1 Sim 2 Não 3 Não sabe		
	Consociação e Rotacão da Culturas			
	1 Faz rotação das culturas	1 Sim 2 Não 3 Não sabe		
	2 Faz consociação de milho e amendoim	1 Sim 2 Não 3 Não sabe		
	3 Faz consociação de milho e feijão nhemba	1 Sim 2 Não 3 Não sabe		
	4 Faz consociação de milho e mapira ou mexoeira	1 Sim 2 Não 3 Não sabe		
	5 Faz consociação de mapira e mexoeira	1 Sim 2 Não 3 Não sabe		
	Pragas			
	1 Prepara remédio caseiro para combater as pragas	1 Sim 2 Não 3 Não sabe		
	2 Usa armadilhas ou barreiras para controlar as pragas	1 Sim 2 Não 3 Não sabe		
	Control de Erosão			
	1 Usa barreiras de capim, troncos, ou pedras para controlar a erosão	1 Sim 2 Não 3 Não sabe		
	2 Usa arbustos (cercas vivas) para controlar a erosão	1 Sim 2 Não 3 Não sabe		
	3 Faz curvas de nível no terreno	1 Sim 2 Não 3 Não sabe		
	4 Usa cobertura de mulching	1 Sim 2 Não 3 Não sabe		
	5 Planta árvores na machamba	1 Sim 2 Não 3 Não sabe		
	Fertilidade dos Solos			
	1 Prepara composto orgânico	1 Sim 2 Não 3 Não sabe		
	2 Usa estrume de animais	1 Sim 2 Não 3 Não sabe		
	3 Usa adubo verde	1 Sim 2 Não 3 Não sabe		
	Pos Colheita			
	1 Faz gestão e planificação da sua produção	1 Sim 2 Não 3 Não sabe		
	Insumos Agrícolas			
	1 Usa sistema de irrigação com bomba	1 Sim 2 Não 3 Não sabe		
	2 Usa pesticida/herbicida/insecticida químicos	1 Sim 2 Não 3 Não sabe	} 1 ---> 40 } 2 ou 3 -----> 42	
	3 Usa adubo químico	1 Sim 2 Não 3 Não sabe		
40	Onde obteve adubos químicos ou pesticidas/herbicida/insecticidas químicos?			
	0 não sabe	1 Sim 2 Não		
	1 lojas locais/mercados	1 Sim 2 Não		
	2 lojas na Beira	1 Sim 2 Não		
	3 donativos/presentes	1 Sim 2 Não		
	4 vizinho/família	1 Sim 2 Não		
	5 estação de investigação de Lamego	1 Sim 2 Não		
	6 governo DDA	1 Sim 2 Não		
	7 igreja	1 Sim 2 Não		
	9 outro (especificar)			
41	Se recebeu produtos químicos, recebeu algum treinamento de como usá-lo?	1 Sim 2 Não 3 Não sabe		

Questionario no: _____
 Chequed by: _____

SPEAR MID-TERM SURVEY -- APRIL 1996

A. DADOS DE IDENTIFICACAO (Preencher pelo supervisor)

Data _____

Codigo do Entrevistador _____

Distrito

- 1 - Buzi
- 2 - Dondo
- 3 - Gorongosa
- 4 - Nhamatanda
- 5 - Marrromeu

Codigo da aldeia _____

Quando comecou a assistencia de extensao da FHI nesta aldeia? 199 _____

B. DADOS GERAIS (Preencher pelo entrevistador)

PREENCHA O NOME DA ALDEIA _____

1. Pessoa(s) entrevistada:
 - 1 - Homen
 - 2 - Mulher
 - 3 - Ambos

2. Quem é Chefe da sua familia?
 - 1 - Homen
 - 2 - Mulher

3. Desde quando a sua familia reside nesta aldeia? Desde 19 _____

4. A sua familia tem interesse em voltar ao lugar de origem ou em mudar para outro lugar?
 - 1 - Sim
 - 2 - Não

5. Qual é a principal actividade:

da familia?	1 - Machamba	2 - Outra	
do homen?	1 - Machamba	2 - Outra	9 - não applicavel
da mulher?	1 - Machamba	2 - Outra	9 - não applicavel

6. Cortam a lenha para cozinhar?
 - 1 - Sim
 - 2 - Não

Caso sim: A que distancia (quanto tempo) percorrem para cortar a lenha?

Tempo: _____ hora _____ minutos (NOTA: se não, não lida e '0.00)

Utiliza outro tipo de combustivel para cozinhar?

- (respostas multiplas possíveis)
- 1 - Compra lenha (só corta)
 - 2 - Carvão
 - 3 - Petróleo
 - 4 - outro tipo de combustivel

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7. Compra óleo líquido de cozinhar?

- 1 - Sim
- 2 - Não

Caso sim: Quanto compra mais ou menos por semana?

Quantidade: _____

- 1 - em tampas
- 2 - em latas de refresco
- 3 - em litros

8 Se pudesse comprar somente dois tipos de óleo, óleo de girasol ou de gergelim, qual tipo preferia?

- 1 - Girasol
- 2 - Gergelim
- 9 - não tem preferencia

Porqué prefere este tipo de óleo?

- 1 - preço
- 2 - sabor
- 3 - qualidade de armazenamento
- 4 - qualidade de preparação
- 5 - disponibilidade local
- 6 - outro
- 9 - não aplicavel

9 Quantas pessoas vivem na sua casa?

total # _____ pessoas

	Sexo	Frequenta escola ?	Trabalha na machamba ?	Tem outro emprego ?	Qual tipo de emprego
ano de nascimento	1 - Homen 2 - Mulher	1 - Sim 2 - Não	1 - Sim 2 - Não	1 - Sim 2 - Não	veja codigos
Chefe					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Codigos para tipo de emprego

- 1 - nas machambas dos outros
- 2 - empregada na fabrica/ empresa
- 3 - vendedor regular/ comerciante
- 4 - ganho/ ganho (cada tipo)
- 5 - empregada domestico
- 6 - outro
- 9 - não aplicavel

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C DADOS SOBRE AGRICULTURA

11 Quando terminou a sua alimentacao (milho) que produziu na primeira ou segunda época no ano passado (1994/95)?

mes _____ (numero: _____)

10 Armazenou a sua alimentação da colheita do ano passado 1994/95? 1 - Sim
2 - Não

Caso Sim continua no quadro

	Guardou?	Onde guardou a alimentação?	Qual parte da alimentação foi perdida por causa das pragas no armazem?
	1 - Sim 2 - Não	1 - celeiro encima de cozinha 2 - celeiro com teto 3 - celeiro sem teto 4 - bilha ou cesta 5 - em casa no sacco 6 - outro 9 - não aplicavel	1 - não perdida 2 - um pouco 3 - cerca de 1/4 4 - metade 5 - cerca de 3/4 6 - perdida total 7 - não sabe 9 - nao aplicavel
Milho			
Mapira			
Arroz			
Feijão Nhemba			
Amendoim			

12 Comprou milho para o consumo da família no ano passado? 1 - Sim
2 - Nao

Caso sim: Quanto milho comprou por mes?

Quantidade _____

- 1 - em latas de 20 litros
- 2 - em sacos de 50 kilo
- 3 - em sacos de 100 kilos

13 Recebeu comida gratuita nos ultimos 6 meses? 1 - Sim
2 - Nao

Caso sim: Quantos vezes recebeu?

= _____ vezes

9 - não sabe

Quantos kilos de milho por vez? _____

Quantos litros de oleo por vez? _____

14 Quantas machambas tem a sua família nesta primeira época? Total # _____ Machambas

15 Qual é o tamanho dessas machambas nesta primeira época?

Qual é o tamanho dessas machambas?		tipo de terra?	Distancia da casa (só ida, não ida e volta)	Como adquiriu a sua terra?
	medida da machamba	1 - baixa 2 - machamba seca 3 - plano alto 4 - outro 9 - não sabe	1 - perto da casa 2 - entre 10 - 40 minutos 3 - entre 40 minutos e 1 hora 4 - mais que um hora 9 - não sabe	1 - sempre era propriedade da família 2 - paga renda 3 - comprou 4 - ocupa com permissão de regulo ou secretaria 5 - ocupa sem permissão 6 - outro 9 - não sabe
machamba 1	ha m ²			
machamba 2	ha m ²			
machamba 3	ha m ²			
machamba 4	ha m ²			
outros machambas	ha m ²			

16 Nesta época, cultiva mais/ menos/ mesma quantidade da terra do que dois anos atrás?

- 1 - quantidade maior
- 2 - quantidade menor
- 3 - mais ou menos mesma quantidade
- 4 - nao sabe

17 Nesta época, a quantidade da terra é suficiente para as suas necessidades?

- 1 - Sim
- 2 - Nao

19 Nesta época, houve problemas que limitaram o tamanho da terra, que voce queria cultivar ?

- 1 - Sim
- 2 - Não

Caso sim. quais foram os problemas os mais importantes?

Escreva problema: Veja codigos na lista

1 _____ 1 _____
2 _____ 2 _____

18 Acha que a sua família seja capaz abrir mais machambas na proxima época?

- 1 - Sim
- 2 - Não
- 3 - Não sabe

20 Quais são as práticas voce fez para preparar a terra antes de semear?

1 _____
2 _____
3 _____

Veja codigos na lista 1 _____
2 _____
3 _____

21 O que é que voce fez para preparar sementes antes de semear?

1 _____
2 _____
3 _____

Veja codigos na lista 1 _____
2 _____
3 _____

22 Como obteve sementes para semear nesta época? (respostas multiplas possiveis)

- 1 - guardou sementes da machamba da época passada → VAI A QUESTAO 23
- 2 - comprou no mercado local
- 3 - comprou no SEMOC 2, 3, 4 → VAI A QUESTAO 24
- 4 - comprou de vizinhos ou familia
- 5 - troca dos produtos
- 6 - doada pelos vizinhos ou familia 5, 6, ... → VAI A QUESTAO 25
- 7 - doada pela organizacao
- 8 - outro (que? _____)
- 9 - não sabe

23 No caso de conservação das sementes, quantos kilos de sementes guardou da machamba da época passada, para semear nesta campanha?

	Cultivou? EPOCA 94/95	Guardou sementes?	Quantidade guardada?	
	1 - Sim 2 - Nao	1 - Sim 2 - Nao 9 - Nao aplicavel	Quantidade	Codigo: 1 - lata de 20 litros 2 - lata de 5 litros 3 - lata de 1 litro 4 - kilos
Milho				
Mapira				
Arroz				
Feijão Nhemba				
Amendoim				
Maxoeira				

24 No caso de compra das sementes, quantos kilos comprou para semear na última campanha?

	Cultivou? EPOCA 94/95	Comprou sementes?	Quantidade comprou?	
	1 - Sim 2 - Nao	1 - Sim 2 - Nao 9 - Nao aplicavel	Quantidade	Codigo: 1 - lata de 20 litros 2 - lata de 5 litros 3 - lata de 1 litro 4 - kilos
Milho				
Mapira				
Arroz				
Feijão Nhemba				
Amendoim				
Maxoeira				

25 Quantas sementes vai guardar para semear na próxima época?

- 1 - menos do que a época passada
- 2 - pelo menos as mesmas quantidades
- 3 - mais do que a época passada
- 4 - depende da situação, nao sabe
- 5 - nao vai guardar

26 Quantos kilos de milho vai guardar como sementes para a próxima época?

_____ kilos

27 Nesta época, tem problemas que limitaram a produção nas suas machambas ? 1 - Sim 2 - Não

Caso sim Qual são os problemas?

Escreva os problemas:
(de mais respostas que sejam possíveis)

Veja códigos
na lista

Milho 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Mapira 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Arroz 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Feijão
Nhamba 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Amendoim 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Maxoeira 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Mandioca 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Batata doce 1 - Não cultivada nesta época
2 - Não tem problemas
3 - Sim problema _____

Outra cultura _____

28 Nesta época, quais são as culturas que você está a cultivar?

	Cultiva nesta época?	Consociação com outra cultura?	Medida da machamba(s) onde cultivava?	Qual parte da machamba já colheu?	Qual quantidade colheu?	Qual parte da produção foi perdida?
	1 Sim 2 Não	1 - Sim 2 - Não 9 - Não aplicável		1 - totalmente 2 - quase todo 90% 3 - mais de metade 75% 4 - metade 50% 5 - menos de metade 25% 6 - só pouco 10% 7 - ainda não colheu 9 - não aplicável	preencha quantidade e código de peso (veja lista) quantidade código	1 - não perdidas 2 - um pouco 3 - cerca de 1/4 4 - metade 5 - cerca de 3/4 6 - perda total 7 - não sabe 9 - não aplicável
Milho			ha m ²			
Mupira			ha m ²			
Alhoz			ha m ²			
Feijão Nhemba			ha m ²			
Amendoim			ha m ²			
Macaueira			ha m ²			
Mandioca			9	9	9	9
Batata Doce			9	9	9	9

29 Quais são as práticas que você faz para melhorar e conservar o solo?

veja códigos na lista:

1 _____ 2 _____ 1 _____ 2 _____
3 _____ 4 _____ 3 _____ 4 _____

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30 Cultiva outro tipo de feijão que não é feijão nhemba? 1 - Sim 2 - Não

Caso sim: Quais tipo(s) de feijão?

Faz consociação com outra cultura?

1 - Feijão Manteiga	1 - Sim	2 - Não	9 - não aplicavel
2 - Feijão Boer	1 - Sim	2 - Não	9 - não aplicavel
3 - Feijão Jugo	1 - Sim	2 - Não	9 - não aplicavel
4 - Lab-Lab	1 - Sim	2 - Nao	9 - nao aplicave.
5 - outro tipo _____	1 - Sim	2 - Não	

31 Tem pragas nas suas machambas? 1 - Sim 2 - Não

Quais são as principais pragas que afectam as suas culturas na machamba?

<u>Culturas</u>	<u>Escreva pragas</u> (mais que uma resposta é possível)			<u>veja codigos</u> na lista
Milho	_____	_____	_____	_____
Mapira	_____	_____	_____	_____
Arroz	_____	_____	_____	_____
Feijão	_____	_____	_____	_____
Amendoim	_____	_____	_____	_____
Maxoeira	_____	_____	_____	_____
Mandioca	_____	_____	_____	_____
Batata doce	_____	_____	_____	_____
Outras culturas com pragas?	_____	_____	_____	_____
	_____	_____	_____	_____

32 O que é que voçe faz para combatar ou controlar as pragas nas machambas?

1 _____
2 _____
3 _____

veja codigos na lista: 1 _____
2 _____
3 _____

33. Plantou as culturas óleaginosas (girassol/ gergelim) nesta época? 1 - Sim
2 - Nao

Caso sim: continua no quadro

	Cultiva nesta época?	Como obteve sementes?	Medida da machamba onde cultivava?	Quantidade da colheita?
	1 - Sim 2 - Nao	1 - guardou 2 - comprou 3 - doado 4 - outro 9 - não aplicavel		em kilos
Girassol			Ha m ²	
Gergelim			Ha m ²	

34 Cultivou hortículas no ano passado? 1 - Sim
2 - Não

Caso sim: continua no quadro

	Cultivou ano passado?	Vendeu?
	1 - Sim 2 - Nao	1 - Sim 2 - não 9 - não aplicavel
Tipo de hortícula		
Cebola		
Tomate		
Pimento		
Piri-piri		
Couve		
Repolho		
Alho		
Alface		
outro		

35 Cultiva (ou vai cultivar) hortículas nesta segunda época? 1 - Sim
2 - Nao

Caso Sim: Come vai obter sementes de hortículas?

- 1 - gardou da colheita do ano passado
- 2 - comprou ou vai comprar
- 3 - doação
- 4 - outro

36 Caso Sim: O que é que voce esta a fazer para melhorar a produção das hortículas?

veja codigos

1 _____ 1 _____
2 _____ 2 _____

37. Cria animais? 1 - Sim
 (incluindo galinhas e patos) 2 - Nao

caso sim: continua no quadro

	Cria?	Qual é a quantidade voce tem?	Vende as vezes?	Quantidade vendeu no ano passado?
Tipos de animais:	1 - Sim 2 - Nao		1 - Sim 2 - Nao 9 - Nao aplicavel	
Galinhas				
Cabritos				
Porcos				
Patos				
Coelho				
Porquinhos da India				
Vacas				

38 No caso de criar galinhas, as suas galinhas tem sido vacinadas no ano passado?

1 - Sim Caso sim, quantas foram vacinadas? # _____
 2 - Nao
 9 - Não aplicavel

D DADOS SOBRE ECONOMIA

39 A sua família possui os artigos seguintes?
 (Nota os artigos que funcionam)

Quantos pratos tem?	Quantidade?
Pratos	
Panelas	
Cadeiras	
Cama	
Colchao	
Candeeiro	
Radio	
Bicicleta	
Relogio do pulso ou de parede	
Maquina de costura	

40 A sua família teve rendimentos as vendas no último ano?

Teve rendimentos em dinheiro no último ano?	1 - Sim 2 - Não	Aproximadamente qual foi a receita dessas fontes? (em meticals)
Venda de culturas alimentares		
Venda de culturas de rendimento		
Venda de hortículas/ frutas		
Venda de gado/ animais		
Venda de lenha/ carvão		
Venda de peixe		
Venda de nipa ou outras bebidas alcoólicas		
Venda de outros produtos		

41 A sua família teve vencimentos regulares ou temporários no ano passado? (incluindo trabalho ganho-ganho, trabalho artesanal, ou outro trabalho)

- 1 - Sim
- 2 - Não

Caso Sim: aproximadamente qual foi a salário no ano passado?

- 1 - por mes. _____ (MT) Quantos meses? _____
- 2 - por dia _____ (MT) Quantos dias por mes? _____

42 A sua família obteve dinheiro nas outras fontes, por exemplo aposentados do governo, donativos da familiares ou outros donativos no ano passado?

- 1 - Sim
- 2 - Não

Caso sim: aproximadamente qual foi a receita dessas fontes no ano passado?

_____ (MT)

E DADOS SOBRE ASSISTENCIA DE EXTENSAO:

43. Voce recebeu assistencia de extensao agricola da Fundação Contra Fome?

durante esta época?	1 - Sim	2 - Não
durante a época 1994/95?	1 - Sim	2 - Não
durante épocas antes 1994	1 - Sim	2 - Não

Caso sim: a quantos anos recebeu assistencia de extensão da Fundação?
anos _____

No caso de 3 vezes NAO, vai continuar a QUESTAO 49

44 No caso de receber assistencia, como recebe assistencia de extensão da FHI?

1 - visitas individuais na machamba
2 - em grupo
3 - ambos

45 No caso das visitas individuais na machamba: quantos vezes foi visitado pelo extensionista por mes ?

_____ vezes

46 Qual é a sua opinião sobre a valor da assistencia dado pela Fundação Contra Fome?

1 - é muito útil
2 - é bastante útil
3 - é pouco útil
4 - não é útil
9 - não sabe

47 Atraves do conselho do extensionista aumento o seu rendimento das culturas?

1 - Sim
2 - Não

48 Desde que voce recebeu assistencia da Fundação mudou as suas maneiras da cultivar?

1 - Sim
2 - Não

Caso sim, quais prat.cas apprendidas voce está a praticar nas suas machambas?

1 _____
2 _____
3 _____

49 Voce faz as seguintes praticas nas suas machambas?

1	Queimar terras antes de semear	1	Sim	Nao
2	Incorporar materia organica antes de semear	2	Sim	Nao
3	Faz selecção da semente a nivel de campo	3	Sim	Nao
4	Testar a sua semente para germinacao antes semear	4	Sim	Nao
5	Semear milho em linhas	5	Sim	Nao
6	Reduzir espaços entre linhas de milho	6	Sim	Nao
7	Reduzir espaços entre plantas de milho	7	Sim	Nao
8	Reduzir número das sementes por cova	8	Sim	Nao
9	Pratica de rotacao das culturas	9	Sim	Nao
10	Consociação de milho e amendoim	10	Sim	Nao
11	Consociação de milho e mapira	11	Sim	Nao
12	Consociação de milho e feijão nhemba	12	Sim	Nao
13	Consociação de milho e outro tipo de feijão	13	Sim	Nao
14	Prepara composto organico	14	Sim	Nao
15	Usa estrume dos animais	15	Sim	Nao
16	Usa adubo verde	16	Sim	Nao
17	Usa adubo quimico	17	Sim	Nao
18	Prepara remedio caseiro para combate as pragas	18	Sim	Nao
19	Usa de armadilhas ou barreiras para controlar as pragas	19	Sim	Nao
20	Usa pesticidas quimicas	20	Sim	Nao
21	Usa barreiras usando capim, troncos, ou pedras para controla erosão	21	Sim	Nao
22	Usa arbustos (cercas vivas) para controlar erosão	22	Sim	Nao
23	Faz gestão e planificação da sua produção	23	Sim	Nao

SPEAR BASELINE SURVEY -- JANUARY 1995

DADOS DE IDENTIFICACAO

Equipa _____

Questionario no. _____

Data _____

Distrito _____ (NH = Nhamatanda, DO = Dondo, BU = Buzi, GO = Gorongosa,
MA = Marrromeu)Aldeia _____ (JASS = Jasse, MUDA = Muda, SILU = Siluvu,
METU = Metuchira Pita, RUAD = Rua Domingo, MAFA = Matcirina,
BLOC = Bloco 9, TUND = Tundane/Ngutue, CANH = Canhandula
BAND = Bandua II, MANG = Manguena, USSI = Ussingue, MAGI = Magimba
MAPO = Mapombwe, MUCO = Mucodza, TAMB = Tambarara
TAZA = Tazaronda, NNDO = Nhambondo, CHUE = Chueza, PAND = Pandue
MACU = Macuere, VILA = Vila Nova Salone, CUND = Cundue,
NULA = Nhamula)

Quando e que a assistencia de extensao de FHI comecou na aldeia? (ano _____)

Pessoa(s) entrevistada _____ (H = Homem, M = Mulher, A = Ambos)

Chefe de familia _____ (H = Homem, M = Mulher)

DADOS GERAIS___1 A quanto tempo reside nesta aldeia? # anos _____
[Menos que 1 ano = 0 5]___2 Tem interesse em voltar ao lugar de origem ou mudar para outro lugar?
Sim Nao (marque com um circulo)___3 Quantas pessoas vivem na vossa casa? # total _____
masculino feminino
Idades 0-5 # _____ # _____
Idades 6-12 # _____ # _____
Idades 13-17 # _____ # _____
Idades 18-56 # _____ # _____
Idades 57+ # _____ # ________4 Qual e a principal actividade da familia? _____
do homen? _____
da mulher? _____
M = Machamba
O = Outra (que? _____)

___ 5. Quantos em sua casa vao a machambas? # total. _____

	masculino	feminino
Idades 0-5	# _____	# _____
Idades 6-12	# _____	# _____
Idades 13-17	# _____	# _____
Idades 18-56	# _____	# _____
Idades 57 +	# _____	# _____

___ *6. Quantas pessoas tem emprego na vossa casa? (trabalhos eventuais remuneraveis)
total _____ Codigos por emprego _____
homens _____ tipo(s) do emprego _____
mulheres _____ tipo(s) do emprego _____

*JUNTE CODIGOS DO PAPEL SEPARADO POR TIPOS DO EMPREGO (6), DEPOIS DO FIM DO LEVANTAMENTO

___ 7. Quantas pessoas na vossa casa frequentam a escola? # total _____

	masculino	feminino
Idades 0-5	# _____	# _____
Idades 6-12	# _____	# _____
Idades 13-17	# _____	# _____
Idades 18 +	# _____	# _____

___ 8. A que distancia estao do posto medico? (# de km) _____
(NOTA 1 hora = 6 km, ida so, nao ida e volta)

___ 9. Que tipo(s) de fonte usam para buscar a vossa agua de beber?
(respostas multiplas possiveis, marque com circulo)
1 = poco particular
2 = poco publico (fontenaria)
3 = rio
4 = lago
5 = pantano
6 = outro (qual? _____)

___ 10. A que distancia fica a vossa fonte? (# de km) _____
(NOTA 1 hora = 6 km, ida so, nao ida e volta)

___ 11. Quem busca a agua para a vossa casa?
(respostas multiplas possiveis, marque com circulo)
M = Mulher
H = Homem
CF = crianas femininas
CM = crianas masculinas

___12. Cortam a lenha para usar como combustivel? Sim Nao (marque com um circulo)

Se nao, o que utilizam como combustivel para cozinhar? _____

L = Compra lenha (nao corta)

C = carvao

P = petroleo

O = outro (que? _____)

___13 Que distancia percorrem para cortar a lenha? (# de km) _____

(NOTA 1 hora = 6 km, ida so, nao ida e volta)

(NA = Nao e applicavel)

___14 Quem busca a lenha para a vossa casa?

(respostas multiplas possiveis, marque com circulo)

M = Mulher

H = Homem

CF = crianças femininas

CM = crianças masculinas

(NA = Nao e applicavel)

DADOS SOBRE ECONOMIA

___*15a Como obtem dinheiro em sua casa? (liste todos e marque codigo)

Como obtem

Codigo*

*JUNTE CODIGOS DO PAPEL SEPARADO (15a), DEPOIS DO FIM DO LEVANTAMENTO

___15b Se tem emprego, qual e o salario?

_____ MT por (so um resposta, marque com um circulo)

1 = dia

2 = semana

3 = mes

___ **15c. Se vende, o que vende? Quanto vendem por mes?

<u>O que vende?</u>	<u>Codigo** (por o que vende)</u>	<u>Quantidade vendem por mes</u>	<u>Codigo por unidade de medir***</u>	<u>Quantidade em kg (NA = nao e applicavel)</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**JUNTE CODIGOS POR O QUE VENDE DO PAPEL SEPARADO (15C), DEPOIS DO FIM DO LEVANTAMENTO

___ 16. Quando terminou a sua alimentacao (milho) que produziu? mes _____

Comprou milho para o consumo no ano passado? Sim Nao (marque com um circulo)

Se sim, quanto milho comprou no mes?

<u>Quantidade</u>	<u>Codigo por Unidade de Medir***</u>	<u>Quantidade in kg</u>
_____	_____	_____

___ 17 Ja recebeu comida gratuita nos ultimos 6 meses? Sim Nao (marque com um circulo)

Se sim, que tipo e quanto?

<u>Comida</u>	<u>Quantidade</u>	<u>Tipo de Unidade**</u>	<u>Quantidade in kg</u>
Milho	_____	_____	_____
Feijoes	_____	_____	_____
Oleo	_____	_____	_____
Outro (qual?)	_____	_____	_____

***Codigos para tipos de unidades de medir (por perguntas 15c, 16, e 17)

- 1 = saco de 50 kg
- 2 = saco de 100 kg
- 3 = lata de 20 L (16 kg)
- 4 = galon (lata de 5 L) (4 kg)
- 5 = lata de cerelac (1 kg)
- 6 = lata de azeite oliveira (1 L) (1kg)

___ 18 Consoma oleo de cozinhar? Sim Nao

Se sim, quanto compra por semana?

<u>Quantidade</u>	<u>Codigo por Unidade****</u>	<u>Quantidade em litros</u>
_____	_____	_____

E produzida numa prensa local? Sim Nao (marque com um circulo)

****Codigos para tipos de unidades de medir para oleo

- 1 = 1 litro
- 2 = 1 tampa (= 15 ml)
- 3 = 1 lata de refresco (300 ml)

___ 19. Que tipo de oleo de cozinha prefere comprar? _____
[So 1 resposta]

- GIRA = oleo de girassol
- GERG = oleo de girgelim
- SOJA = oleo de semente de soja
- AMEN = oleo de amendoim
- ALGO = oleo de semente de algodao
- COCO = oleo de coco
- OUTR = outro (qual? _____)

___ 20 Porque e que prefere este tipo de oleo? _____

- 1 = preco
- 2 = sabor
- 3 = qualidade de armazenamento
- 4 = qualidade de preparacao
- 5 = disponibilidade local
- 6 = outro (qual? _____)

___ 21. [So em Marrameu e Dondo]

A que distancia fica a sua prensa mais proxima? (distancia em km) _____
(NOTA: 1 hora = 6 km, ida so, nao ida e volta)

___ *22. Quais outros alimentos que compra regularmente (pelo menos todos meses)? E quem come na sua familia?

(H = homens, M = mulheres, C = criancas, respostas multiplas possiveis)

Alimentacao	Codigo* por alimentacao	Quem come? (H, M, CL5, CG5)			
		Quem come? (H, M, CL5, CG5)			
_____	_____	H	M	CL5	CG5
_____	_____	H	M	CL5	CG5
_____	_____	H	M	CL5	CG5
_____	_____	H	M	CL5	CG5
_____	_____	H	M	CL5	CG5
_____	_____	H	M	CL5	CG5
_____	_____	H	M	CL5	CG5

H = Homem, M = Mulher, CL5 = criancas abaixo de 5 anos, CG5 = criancas acima de 5 anos

*JUNTE OS CODIGOS DE ALIMENTOS NUMA PAGINA SEPARADA (22) DEPOIS DE COMPLETAR O LEVANTAMENTO

DADOS SOBRE AGRICULTURA

___ 23 Quantas machambas tem nesta epoca?
_____ Tamanho (total) _____ unidades m² ha (marque com circulo)

___ 24 Que quantidade de terra a sua casa cultivou no ano passado (epoca 1993/94)?
machambas _____ Tamanho (total) _____ unidades m² ha (marque com circulo)

___ 25 Esta quantidade de terra e suficiente para as suas necessidades? Sim Nao

___ *26. Quais foram os problemas que limitaram o tamanho da area cultivada no ano passado ?
(Enumere em funcao da importancia)

_____	_____
_____	_____
_____	_____

*JUNTE OS CODIGOS NA PAGINA SEPARADA (26), DEPOIS DE COMPLETAR O LEVANTAMENTO
Codigos em funcao da importancia _____
(NA = Nao applicavel)

___ *27. Quais foram os problemas mais importantes que limitaram a sua producao nas tuas
machambas na epoca passada? (Enumere em funcao da importancia)

Cultura	Problemas
_____	_____
_____	_____
_____	_____
_____	_____

**JUNTE CODIGOS DA PAGINA SEPARADA (27) POR OS PROBLEMAS DEPOIS DE COMPLETAR O
LEVANTAMENTO. (em funcao da importancia)

<u>Codigo da cultura*</u>	<u>Codigos de problemas** (en funcaoda importancia)</u>
_____	____ _
_____	____ _
_____	____ _
_____	____ _

*CODIGOS DE CULTURAS

- 1 = Milho
- 2 = Mapira
- 3 = Arroz
- 4 = Feijoes
- 5 = Amendoim
- 6 = Moxoeira
- 7 = Mandioca
- 8 = Batata doce
- 9 = Gergelim
- 10 = Girassol
- 11 = Outro (qual? _____)

___28 Que culturas agrícolas plantou na época 1993/1994? Quanto colheu?

Cultura	Cultiva?		<u>COLHEITA</u>		<u>ARMAZAGEM</u>		<u>VENDIDO</u>		Preço por Unidade
	(Sim ou Nao)	Tamanho da machamba (em ha or m2)	Quantidade	Código por Unidade de Medir*	Quantidade	Código por Unidade de Medir*	Quantidade	Código por Unidade de Medir*	
Milho	S N	_____	_____	_____	_____	_____	_____	_____	_____
Mapira	S N	_____	_____	_____	_____	_____	_____	_____	_____
Arroz	S N	_____	_____	_____	_____	_____	_____	_____	_____
Feijões	S N	_____	_____	_____	_____	_____	_____	_____	_____
Amendoim	S N	_____	_____	_____	_____	_____	_____	_____	_____
Moxoeira	S N	_____	_____	_____	_____	_____	_____	_____	_____
Mandioca	S N	_____	_____	_____	_____	_____	_____	_____	_____
Bata doce	S N	_____	_____	_____	_____	_____	_____	_____	_____
Outras (quais?)		_____	_____	_____	_____	_____	_____	_____	_____
_____		_____	_____	_____	_____	_____	_____	_____	_____
_____		_____	_____	_____	_____	_____	_____	_____	_____
_____		_____	_____	_____	_____	_____	_____	_____	_____
_____		_____	_____	_____	_____	_____	_____	_____	_____

**Códigos para tipos de unidades de medir

- 1 = saco de 50 kg
- 2 = saco de 100 kg
- 3 = lata de 20 L (16 kg)
- 4 = galon (lata de 5 L) (4 kg)
- 5 = lata de cerelac (1 kg)
- 6 = lata de azeite oliveira (1 L)

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___ 29. Quais foram as principais pragas que afectaram o seu cultivo (no campo?) Qual e a quantidade da sua producao que foi perdida por causa destas pestes na machamba?

<u>Culturas</u>	<u>Codigos por Tipos de Pragas*</u> (Enumere em funcao da importancia)			<u>Grau de infestacao**</u>
	<u>Praça1</u>	<u>Praça2</u>	<u>Praça3</u>	
Milho	_____	_____	_____	_____
Mapira	_____	_____	_____	_____
Arroz	_____	_____	_____	_____
Feijoes	_____	_____	_____	_____
Amendoim	_____	_____	_____	_____
Moxoeira	_____	_____	_____	_____
Mandioca	_____	_____	_____	_____
Batata doce	_____	_____	_____	_____
Outro (qual?)	_____	_____	_____	_____
_____	_____	_____	_____	_____

** JUNTE CODIGOS DA PAGINA SEPARADA (29) POR OS TIPOS DE PRAGAS DEPOIS DE COMPLETAR O LEVANTAMENTO (em funcao da importancia)

** Codigos por quantidade perdida

- 0 = nao perdida
- 10 = So um pouco
- 25 = Alguma mas menos de metade (cerca de 1/4)
- 50 = Metade
- 75 = Mais de metade, mas nao todo (cerca de 3/4)
- 100 = perca total

___ 30 Onde guarda a sua alimentacao? Qual e a quantidade de cada cultura que foi perdida devido a insectos ou danificada durante o armazenamento?

<u>Cultura</u>	<u>Onde armazenou</u>	<u>Codigos por onde armazenou*</u>	<u>Codigos por Quantidade perdida**</u>
Milho	_____	_____	_____
Mapira	_____	_____	_____
Arroz	_____	_____	_____
Feijoes	_____	_____	_____
Amendoim	_____	_____	_____
Moxoeira	_____	_____	_____
Mandioca	_____	_____	_____
Batata doce	_____	_____	_____
Outro (qual?)	_____	_____	_____
_____	_____	_____	_____

* Codigos por onde armazenou

- 1 = celeiro encima da cozinha
- 2 = celeiro livre
- 3 = bilha
- 4 = em casa em sacco
- 5 = outro (qual? _____)

** Codigos por quantidade perdida:

- 0 = nao perdida
- 10 = So um pouco
- 25 = Alguma mas menos de metade (cerca de 1/4)
- 50 = Metade
- 75 = Mais de metade, mas nao todo (cerca de 3/4)
- 100 = perca total

- ___ 31 Onde obteve sementes?
 (respostas multiplas possiveis; marque com circulo)
- 1 = comprou de mercado local
 - 2 = comprou de SEMOC
 - 3 = guardada semente de machamba do epoca passada
 - 4 = troca do produto
 - 5 = comprou de vizinhos ou familia
 - 6 = doada de vizinhos ou familia
 - 7 = doada do organizacao
 - 8 = outro (que? _____)

___ 32 Se guardou sementes, quanto guardou?

<u>Cultura</u>	<u>Quantidade guardou</u>	<u>Codigo por Unidade de medir *</u>	<u>Quantidade em kg</u>
Milho	_____	_____	_____
Mapira	_____	_____	_____
Arroz	_____	_____	_____
Feijoes	_____	_____	_____
Amendoim	_____	_____	_____
Moxoeira	_____	_____	_____
Outros: (quais?)	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

___ 33. Se comprou sementes, quanto comprou?

<u>Cultura</u>	<u>Quantidade Comprou</u>	<u>Codigo por Unidade de medir *</u>	<u>Quantidade em kg</u>
Milho	_____	_____	_____
Mapira	_____	_____	_____
Arroz	_____	_____	_____
Feijoes	_____	_____	_____
Amendoim	_____	_____	_____
Moxoeira	_____	_____	_____
Outros: (quais?)	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

*Codigos para tipos de unidades de medir

- 1 = saco de 50 kg
- 2 = saco de 100 kg
- 3 = lata de 20 L (16 kg)
- 4 = galon (lata de 5 L) (4 kg)
- 5 = lata de cerelac (1 kg)
- 6 = lata de azeite oliveira (1 L) (1 kg)

___34 Plantou as culturas de semente de oleo no ano passado? Sim Nao

Se sim, quais? Qual e a tamanho da area plantada? Qual e a quantidade colhida?

<u>Cultura</u>	<u>Tamanho</u> (em ha ou m2?)	<u>Quantidade</u>	<u>Codigo por</u> <u>Unidade de medir *</u>	<u>Quantidade Colhida</u> (em kg)
Girassol	_____	_____	_____	_____
Gergelim	_____	_____	_____	_____
Outro (Qual?)	_____	_____	_____	_____

*Codigos para tipos de unidades de medir.

- 1 = saco de 50 kg
- 2 = saco de 100 kg
- 3 = lata de 20 L (16 kg)
- 4 = galon (lata de 5 L) (4 kg)
- 5 = lata de cerelac (1 kg)
- 6 = lata de azeite oliveira (1 L) (1 kg)

___35 Quais das seguintes practicas segue nas suas machambas? (marque com circulos)

Queimar terras antes de semear	Sim	Nao
Incorporar materia organica antes da plantacao	Sim	Nao
Plantar as variedades melhoradas de sementes	Sim	Nao
Testar a sua semente para germinacao antes de plantacao	Sim	Nao
Semeiar milho em linhas	Sim	Nao
Practica de rotacao de culturas	Sim	Nao
Consociacao de milho e nhemba	Sim	Nao
Consociacao de milho e mapira	Sim	Nao
Consociacao de milho e amendoim	Sim	Nao
Consociacao de outras culturas (_____)	Sim	Nao
Prepara composto organico	Sim	Nao
Usa estrume dos animais	Sim	Nao
Usa adubo quimico	Sim	Nao
Prepara remedio caseiro para combate aos insectos	Sim	Nao
Usa pesticidas quimicas	Sim	Nao

___36 Cria animais? Sim Nao (marque com um circulo)

<u>Especie</u>	<u>Quantidade</u>
Galinhas	_____
Cabritos	_____
Porcos	_____
Patos	_____
Coelho	_____
Porquinhos da India	_____
Outros (quais? _____)	_____

Se cria animais, quem os cuida?

(respostas multiplas possiveis, marque com um circulo)

- H = Homen
- M = Mulher
- C = Crianças

___37 Se cria galinhas, as suas galinhas tem sido vacinadas no ano transacto?
Sim Nao (marque com um circulo)

Se sim, quantas foram vacinadas? # _____

___ *38. Cultiva vegetais?

Sim Nao (marque com circulo)

Quais?

(Enumere os nomes)

codigo*

Vende? (marque com circulo)

Sim Nao

Sim Nao

Sim Nao

Sim Nao

Sim Nao

Sim Nao

*VEJA NA PAGINA SEPARADA AS LISTAS DE CODIGOS, ESCREVA OS CODIGOS DEPOIS DE COMPLETAR O LEVANTAMENTO

___ 39 Quem cuida as hortas em sua casa?

(respostas multiplas possiveis; marque com circulo)

H = Homem

M = Mulher

C = Crianças

DADOS SOBRE ASSISTENCIA DE EXTENSAO

___ 40. Voce esta actualmente a receber assistencia de extensao agricola da FHI durante esta epoca? Sim Nao (marque com um circulo)

___ 41. Ja recebeu assistencia de extensao agricola da FHI nas epocas anteriores?

Sim Nao (marque com um circulo)

Se sim, a quantos anos recebeu assistencia de extensao agricola da FHI?

anos _____ (L1 = menos de um ano)

Estado nutricional de crianças abaixo de 5 anos de idade

___42. Quantas crianças de 6 meses a 5 anos vivem consigo? _____

___43 Quantas estão em casa neste momento? _____

___44. Para cada idade de criança de 6 meses a 5 anos, registre:

<u>Idade*</u>	<u>Sexo</u>	<u>Altura</u>	<u>Peso</u>	<u>Edema?</u>	<u>Diarreia na</u> <u>semana passada?</u>
	(M,F)	(cm)	(kg)	(Sim, Nao)	(Sim ,Nao)
___ A M	_____	_____	_____	_____	_____
___ A M	_____	_____	_____	_____	_____
___ A M	_____	_____	_____	_____	_____
___ A M	_____	_____	_____	_____	_____

(*Registe a idade em anos se 1 ano ou mais; em meses se abaixo de 1 ano. Circulo "A" se for anos, "M" se for meses.)

LISTA DE CODIGOS PARA AS RESPOSTAS DAS PERGUNTAS 6, 15a, 15c, 22, 26, 27, 29 E 38

CODIGOS GERAIS:

- DK = Nao sabe
- NR = Nao respondeu
- NA = Nao e applicavel

*6. Codigos por tipo de emprego:

- 1 = Empregada domestico
- 2 = Ganho-Ganho
- 3 = Empregada da fabrica (operario)
- 4 = Trabalhador de campo ou plantacao
- 5 = Vendador ambulante
- 6 = Comerciante
- 7 = Outro (que? _____)

*15a. Como obtem dinheiro na sua casa?

CODIGOS POR COMO OBTER DINHEIRO

- EM = Emprego
- GA = Ganho-ganho
- OF = Oferta da familia
- VE = Vende
- OT = Outro (que? _____)

**15c. Se vende, o que vende?

CODIGOS POR O QUE VENDE

- 1 = carvao
- 2 = lenha
- 3 = peixe
- 4 = produtos da machamba
- 5 = galinhas
- 6 = animais (quais? _____)
- 7 = castanha da caju
- 8 = bebidas
- 9 = outro (qual? _____)

*22. Que outros alimentos compra regularmente (pelo menos todos os meses)?

CODIGOS POR ALIMENTOS COMPRADOS

- 1 = carne
- 2 = galinha
- 3 = peixe
- 4 = ovos
- 5 = leite
- 6 = feijao
- 7 = vegetais
- 8 = fruta
- 9 = pao
- 10 = acucar
- 11 = outro (qual? _____)

*26 Quais sao os problemas que limitaram o tamanho da area que cultivou no ano passado?
(Enumere em funcao da importancia.)

CODIGOS POR OS PROBLEMAS DA TAMANHO DA AREA:

- 1 = nao ha problemas
- 2 = insuficiencia de sementes
- 3 = distancia longa da machamba
- 4 = guerra/falta de seguranca
- 5 = a terra disponivel nao e suficiente
- 6 = insuficiencia de tempo
- 7 = falta de instrumentos agricolas
- 8 = doenca
- 9 = outro (qual? _____)

*27. Quais foram os problemas mais importantes ligados a culturas agricolas que gostaria de ser ajudado a resolver? (Enumere em funcao da importancia)

CODIGOS POR OS PROBLEMAS DE PRODUCAO AGRICOLA:

- 1 = nao ha problemas
- 2 = problemas com a preparacao da terra
- 3 = crescimento geralmente pobre
- 4 = colheitas geralmente pobre
- 5 = germinacao pobre de semente
- 6 = pragas (insectos) no campo
- 7 = doencas das plantas
- 8 = ervas daninha
- 9 = ratos no campo
- 10 = danos causados por aves
- 11 = percas no armazenamento por molde
- 12 = percas no armazenamento por insectos
- 13 = percas no armazenamento por ratos
- 14 = transporte do campo para a casa
- 15 = solo pobre (pouca fertilidade)
- 16 = erosao do solo
- 17 = fraca producao de variedades/falta de variedades melhoradas
- 18 = cheias
- 19 = seca
- 20 = roubo de culturas agricolas no campo
- 21 = cabritos ou outros animais que destroem as culturas
- 22 = outro (qual? _____)