Seeds of Life 3
Baseline Survey

Main Report

Ministry of Agriculture and Fisheries
Seeds of Life / Fini ba Moris

Dili, October 2012

This report summarizes the findings of the 2011 Seeds of Life baseline survey carried out by the Ministry of Agriculture and Fisheries / Seeds of Life program, with the assistance of the National Statistics Directorate of the Ministry of Finance.

The report of the survey consists of three parts:

1. The Main Report
2. Volume 2: Data Tables
3. Volume 3: Annexes

The report can be downloaded in PDF format from www.seedsoflifetimor.org

Suggested citation:

Seeds of Life. 2012. *Seeds of Life 3 Baseline Survey*. Ministry of Agriculture and Fisheries, Dili, Timor-Leste

Seeds of Life (Fini ba Moris) is a program within the Timor-Leste (East Timor) Ministry of Agriculture and Fisheries (MAF). The Governments of Timor-Leste and Australia collaboratively fund the program. Australian funding is through the Australian Agency for International Development (AusAID) plus the Australian Centre for International Agricultural Research (ACIAR) and is managed by ACIAR. The Centre for Legumes in Mediterranean Agriculture (CLIMA) within The University of Western Australia (UWA) coordinates the Australian funded activities.

Foreword

The Timor-Leste 2011-2030 Strategic Development Plan puts much store on the development of the agricultural sector as key to the development of Timor-Leste. Agriculture is not only the source of food consumed in the country, it is also how the majority of people make their living. Just over 70% of the people of Timor-Leste live in rural areas, and 63% of all households engage in crop production. For most rural people, improvement in their livelihood and living conditions is dependent on the success of their agricultural activities, be they cultivation of food crops, raising livestock or producing export crops.

The Seeds of Life (SoL) program focuses on an important agricultural sub-sector: the production and distribution of more productive seeds and cuttings of the major food crops cultivated by farming families in Timor-Leste. The program's objective is to ***improve food security through increasing the productivity of staple crops*** (corn, rice, peanut, sweet potato and cassava)

A crucial part of such efforts is the collaboration of the Ministry of Agriculture and Fisheries and SoL Phase 3 which aims to ensure that farmers have access at planting time to quality planting materials of the range of food crop varieties proven to be 25-100% higher-yielding than local varieties under normal farmers' practice. *Food security begins with seed security.*

Informed policy-making for a program like SoL and other smallholder agriculture development programs depends on a sound understanding of the basic conditions faced by farming families, and the various situations in which they must make their farming decisions. Without such understanding any supportive plans and actions will be based on how others perceive or imagine conditions to be, rather than as they really are.

This baseline survey helps to fill some of these knowledge gaps and provides an opportunity to review planned activities and adapt or revise them to be more appropriate and effective. The challenge now – for the Seeds of Life program, the Ministry, and its other Development Partners – is to use this information to truly benefit the farming families of Timor-Leste.

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Abbreviations and Acronyms

ACIAR	Australian Centre for International Agriculture Research
ALGIS	Agricultural Land Geographic Information System (MAF)
AusAID	Australian Agency for International Development
DNE	*Direcção Nacional de Estatistica*, National Statistics Directorate
HFIAS	Household Food Insecurity Access Scale
HH	Household
HoH	Head of household
MAEOT	*Ministério de Administração Estatal e Organização do Território*, Ministry of State Administration and Territorial Organization
MAF	Ministry of Agriculture and Fisheries
NGO	Non Governmental Organization
OFDT	On-Farm Demonstration Trial
SEO	Suco Extension Officer
SoL	Seeds of Life

Executive Summary

The Seeds of Life (SoL) program in Timor-Leste started in 2001, with support from the Australian Centre for International Agriculture Research (ACIAR), by introducing and testing new genetic stocks of food staples in research stations. In 2005, the Australian Agency for International Development (AusAID) and ACIAR jointly supported a second phase of the program, in which the emphasis was on identifying more productive food crop varieties through participatory testing of crops with farmers, and on starting production of formal seed of the released varieties for distribution to farmers. The third phase of SoL (2011-2016) continues the activities of variety selection and testing, and production of formal seed, but expands on it through large-scale informal seed production and distribution by farmer groups, and by support for the establishment of a national seed system.

To gain a better understanding of the status of foodcrop seed management and practices at the start of the third phase of the program, a baseline survey was conducted in October 2011 in 100 sucos selected from all 13 districts in Timor-Leste. A total of 1,800 households were visited and interviewed, 18 in each suco, by 11 four person teams that were contracted through the National Statistics Directorate.

This report covers the analysis of the baseline data, and the discussion of the findings. In presenting the results of the survey, it is always difficult to decide how much data to report, especially if data has been collected down to the suco level. To avoid making this main report longer than it already is, most of the tables with the more detailed data per district has been placed in a separate volume, Volume 2: Data Tables.

The key findings from the baseline survey are as follows:

- Out of every 100 farmers in Timor-Leste,
  - 84 grow cassava
  - 83 grown corn
  - 54 grow sweet potato
  - 38 grow rice
  - 23 grow peanut
- In 2011, overall 18% of the farmers cultivated already one or more MAF/SoL varieties. The adoption rates of the specific MAF/SoL varieties were:
  - 16% of the peanut farmers grew Utamua
  - 13% of the corn farmers grew Sele
  - 11% of the rice farmers grew Nakroma
  - 7% of the sweet potato farmers grew a Hohrae variety
  - 3% of the cassava farmers grew a Ai-luka variety

- The most commonly grown varieties for the five main crops are:
    - **Corn**: *Batar bo'ot* (grown by 67% of the corn farmers) and *batar lais* (46%). A total of 69% of the corn farmers only grow one variety.
    - **Rice:** IR-64, *Mamberamo* and *Dinas*, each grown by 13% of the rice farmers. Rice farmers usually only grow one rice variety (90%); only 8% of rice farmers grow two varieities.
    - **Peanut:** Utamua seems already to be the most popular variety of peanut being grown in Timor-Leste, with 16% of the peanut farmers growing it.
    - **Cassava**: *Manteiga bo'ot* (grown by 55% of the cassava farmers), *Manteiga kiik* (38%) and *Nona Metan* (31%). About half of the cassava farmers grow only one variety, 40% cultivate two varieties, and 10% grow three varieities. Ai-luka 2 is three times more popular than Ai-luka 4.
    - **Sweet potato**: The *Lokal mean* and *lokal mutin* varieties are grown by respectively 69% and 67% of the sweet potato farmers. Of the three Hohrae varieties, Hohrae 1 is about three times as popular as Hohrae 2 or Hohrae 3. Half of the sweet potato farmers cultivate one variety, and 47% cultivate two varieties.
- Free distribution of seed or cuttings was the main source of the planting material for all main five crops. Buying of seed or planting material in the market, or from an acquaintance, is still rather low.
- Nearly 60% of the corn farmers store corn for either food or seed only in one way, and just over 40% store corn in two ways. The majority of corn farmers (54%) store corn for food and seed together, and 41% store it separately.
- The two most popular ways of storing corn are storing it in sacks, or hanging it above the fireplace in the kitchen (both practiced by 45% of the corn farmers). Storage in plastic containers (20%) is more common than storing it in drums (14%).
- The reported percentage losses for stored corn were:
    - 17% when hung up in a tree
    - 16% when stored in an oil drum (held by a single household)
    - 15% when stored in a sack
    - 14% when hung up in the house above the fireplace
    - 14% when stored in a traditional elevated house (*Bouleten*)
    - 5% when stored in a plastic container (held by a single household)

  The loss estimate for storage in drums seems unreliable, since the reported loss in an oil drum shared between households was only 12%,
- Both men and women are active in corn variety selection and corn seed selection; 52% of the men and 48% of the women select the corn variety that will be planted, and 55% of the men vs. 45% of the women select the corn seed.

- For corn seed, the extent of application of different seed selection techniques by the corn farmers is:
  - 61% save seed from the total harvest
  - 49% select corn cobs for seed after they are harvested
  - 20% select specific plants from the standing crop in the field for seeds
  - 10% select seeds from a specific section of the cob
- Seed selling by farmer groups is still a rare event. Only 6% of the respondents knew a farmer group in the suco selling seed. Local seed trade is however already more established; 28% of the farmers knew a seed trader in the local market. Seed fairs were only known to 7% of the farmers.
- The name "Seeds of Life" was only familiar to 13% of the farmers, but 34% of the farmers know one or more people who grew one or more MAF/SoL varieties.
- In the month prior to the baseline survey (between early September and late October 2011, depending on when the data was collected in the district), 88% of the households had not or hardly experienced hunger, 9% had experienced moderate hunger, and 3% had experienced severe hunger.
- Basically all farm households (99.6%) bought on average 39 Kg of rice per month. Of the households buying rice, 62 % bought rice every month.
- The Suco Extension Officer is known to 43% of the farmers. The level of service provided by the Suco Extension Officers is considered "satisfactory" by 17% of the farmers, and "good" by 72% of the farmers.
- Many households own one or more communication tools. The survey found that 49% of the households have a handphone, 22% have a radio and 10% have a TV. Handphones in particular will increasingly become an important channel for contacting farmers, to disseminate agricultural information, and to receive information from the farmers, and those who service them.

There is much valuable information in the baseline survey data, and much more analysis can be done with this data than is presented in this Main Report, or in the accompanying Volume 2 (Data Tables). Some of this will be done in smaller, more targeted studies.

1. Survey Design

1.1 Background

The Seeds of Life (SoL) program is an agriculture development program of the Timor-Leste Ministry of Agriculture and Fisheries (MAF), supported by the Australian Government through the Australian Centre for International Agricultural Research (ACIAR) and the Australian Agency for International Development (AusAID). The goal of the SoL program is to improve food security through increased productivity of major food crops, such as: corn, rice, peanut, sweet potato and cassava. The focus of the program is to improve, throughout the country, the availability of seeds and cuttings of improved varieties with higher yield potentials compared to the local varieties of these crops.

As part of the startup of activities in the third phase of the SoL program (2011-2016), SoL undertook a baseline survey to obtain a reference against which to assess the achievements and effectiveness of the program. The baseline survey will enable benchmarking of changes in distribution patterns of MAF/SoL varieties, and help to inform general agricultural development planning by MAF as well as SoL program planning. The baseline survey assesses what crops are grown by households engaged in growing foodcrops, what seed varieties farmers use, and their practices in storage of corn for seed and food. The baseline also collected some general information on the composition of the household, household amenities and housing conditions

1.2 Survey Locations

During the third phase of the Seeds of Life program (2011-2016), the program will expand to all districts of Timor-Leste. It was therefore decided that the baseline survey should cover all districts, so that it will be possible to assess what impacts the program will have achieved in all districts at the end of the third phase.

1.2.1 Sampling and Sample Size Determination

The purpose of the baseline survey is to obtain information on access and use of seeds for foodcrops, the growing of such crops, and the storage of the harvest. It therefore makes sense to seek such information from that part of the population most involved in agriculture activities, i.e. the rural population. The target population for the baseline survey was therefore not be the total population of Timor-Leste (1,066,409 people, as per the 2010 Population and Housing Census), but those living in areas classified as “rural” (750,323 people, in 136,929 households).

The calculation of the sample followed a ‘probability proportional to size’ approach, based on the proportion of rural households in each district (see Table 1). An *n* value was calculated for each district using the following formula.

$$n_i = \frac{z^2 \, p_i(1 - p_i)}{d^2}$$

in which

- n_i desired sample size of households in district *i*
- z normal standard deviation, which is 1.96 for a 95% confidence interval
- p_i proportion of the target population in district *i* estimated to have the characteristic. In this case, this is the proportion of rural households in the district compared to the total number of rural households in Timor-Leste
- d degree of accuracy required. For the baseline survey we opted for 5% accuracy, thus *d* is 0.05

The calculated sample sizes of the districts were then multiplied with a correction factor to take account of the design effect, because of the two-stage sampling, and of the non-sampling errors. The design effect takes into account that the first stage of sampling involved the selection of 100 sucos from the 400 rural sucos, and the second stage involved the random selection of the aldeias within the sample sucos. Because the sampling methods of the two stages are different, the sample size is increased by a correction factor. For this survey a 10% increase of the calculated sample size was selected to account for contingencies such as non-response or recording errors[1]. The second component of the correction factor takes account of non-sampling errors, which are often larger than the sampling errors. Examples of non-sampling errors are: biased sampling, questions not being understood correctly, records being lost, errors in data input, etc. For this survey, it is estimated that this may affect 10% of the sample, and a denominator of (100-10)% = 90% is used for adjustment. The corrected n_i thus becomes:

$$\text{Corrected } n_i = n_i \times \frac{1.1}{0.9}$$

in which

- n_i sample size for district *i*
- 1.1 design effect. 100% sample size + 10% increase for non-response and recording errors
- 0.9 90%, to account for non-sampling errors.

It was decided, mainly for logistical reasons, that in each suco 18 households would be visited. The number of sample sucos was thus obtained by dividing the calculated sample size of each district by 18, and rounding off the result upwards.

[1] In the literature, a design effect correction factor of 2 is often mentioned, thus doubling the sample size. In this survey, because the sample size was not calculated for the total rural population of Timor-Leste, but sample sizes were calculated by district and then added up, a smaller design effect correction factor of 1.1 is acceptable.

Table 1. Calculation of Sample Size based on the Ratio of Rural Households to Total Households

District	Rural households*	Proportion of rural households	Sample size n_i	Corrected sample size	Number of sample sucos	Number of sample aldeias	Number of sample households
Ainaro	7,819	0.057	83	101	6	18	108
Aileu	6,521	0.048	70	85	5	14	90
Baucau	18,148	0.133	177	216	13	38	234
Bobonaro	14,162	0.103	142	174	10	28	180
Covalima	9,870	0.072	103	126	7	21	126
Dili	6,330	0.046	68	83	5	15	90
Ermera	18,132	0.132	177	216	13	39	234
Liquiça	9,596	0.070	100	122	7	21	126
Lautem	9,403	0.069	98	120	7	21	126
Manufahi	6,087	0.044	65	80	5	15	90
Manatuto	5,689	0.042	61	75	4	11	72
Oecussi	12,310	0.090	126	154	9	26	162
Viqueque	12,862	0.094	131	160	9	27	162
Total	136,929	1.000	1,400	1,711	100	294	1,800
		Total for “rural” in Timor-Leste			400	1,902	136,939
				Percentage	25%	15%	1.31%

* from 2010 Population and Housing Census of Timor-Leste, Vol. 2

As indicated in Table 1, the 100 sucos of the baseline survey add up to 25% of the total number of rural sucos. The baseline survey collected data from 15% of the aldeias in the rural sucos, and of 1.31% of the rural households in Timor-Leste.

The location of the sample sucos is shown in Figure 1. The list of the sucos and aldeias visited during the baseline survey is provided in Vol. 3, Annex 1.

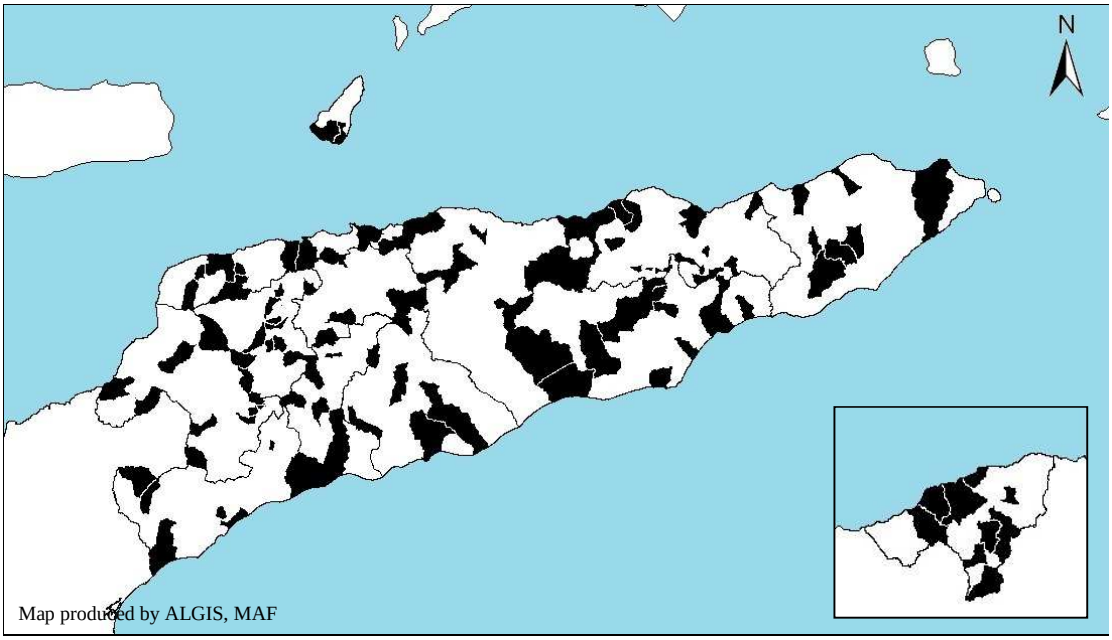


Figure 1. Location of Sample Sucos of the baseline Survey

The selection of the sucos and aldeias was done as follows:

- For each district, the number of rural sucos in the district was divided by the number of sample sucos for that district, as listed in Table 1. This determined the interval for selection of sucos from the list.
- Using the standard list of rural sucos, as used by the National Statistics Directorate (DNE), a first suco was randomly selected, and the subsequent sucos were determined using the interval for that district.
- The process for the selection of the aldeias depended on the number of aldeias in the suco. In sucos with only two or three aldeias, all of these were automatically selected. If there were more than three aldeias in the district, then the aldeias were selected with a simple random sampling, using computer generated random numbers.

1.3 Questionnaire

The Seeds of Life baseline survey questionnaire was developed based on the questionnaires of the Population and Housing Census of Timor-Leste 2010, the National Agricultural Sample Survey Timor-Leste (2007-2008) and the household questionnaires of food security baseline surveys that have been conducted in Timor-Leste by such agencies as CARE and Oxfam.

The draft questionnaire was developed simultaneously in English and Indonesian, and after finalization translated into Tetun. A tryout of the questionnaire was conducted with DNE staff in mid-September 2011 in a non-sample rural suco of the Dili district. The English version of the questionnaire is given in Vol.3, Annex 3, and the Tetun version in Annex 4.

The Seeds of Life baseline survey questionnaire has an introduction and 11 parts. The focus and purpose of each section of the questionnaire was as follows.

Introduction

When the interviewer arrives at the household, she or he introduces her- or himself and explains the purpose of the survey. If the respondent agrees to be interviewed, the eligibility of the household is checked. Only rural households that grow at least one or more of the foodcrops corn, rice, peanut, cassava and/or sweet potato were interviewed. If the household did not engage in foodcrop farming (e.g. only livestock or treecrop cultivation, only fishing), it was not interviewed.

1. **Household identification**

   Data on the district, sub-district, suco and aldeia where the interviewed household lives. Such data is important to compare the results by locality.

2. **Interview particulars**

   The names of the interviewer, field supervisor, office editor and data entry staff who handled the questionnaires, the dates they performed their actions, and the language in which the interview was conducted. Even though the knowledge of Tetun is

increasing, some respondents prefered to be interviewed in a language they were more familiar with[2].

3. Information on the farm household

This section holds data on the head of household (name, age, sex, marital status, level of education) and basic data on the composition of the household (number of male and female members). If the respondent was not the head of household, the name, age and sex of the respondent was noted, together with his or her relationship to the head of household. This data on the household, together with data on the location, is important for subsequent rounds of survey, if it is decided that the same households – or a subsample of them – should be revisited in later years.

4. Land parcels and their usage last year (October 2010 – September 2011)

The respondents were asked how many plots they used in the last year for foodcrop cultivation, what sizes these plots were, how far they were located from the home (in travel time), what crops were grown on the plots, and whether or not the plots were irrigated.

The baseline survey did not attempt to document all the agricultural land the household has access to (e.g. land used for livestock or treecrops), or the ownership status of the plots that are cultivated.

This data provides information on multi-cropping/inter-cropping on both rainfed and irrigated land.

5. Foodcrop production in the last year

In this section, the respondents were asked how much harvest they had for the five above mentioned foodcrops, if they cultivated them, whether they had experienced damages or losses to these crops between planting and harvesting, and if yes, what the reasons for such losses were.

The data on production can be used to calculate estimates of yield, but the interpretation of such information is difficult, especially if intercropping is practised, and if the crop was not planted over the whole of the plot reported in the previous section. The data on causes of crop damages and losses is important to help explore ways of reducing such losses, especially if they are substantial.

6. Seeds and seeds storage

The part on seeds and seeds storage was the core part of the questionnaire, and consisted of several sub-sections.

First, the farmers were asked about the **source of seeds** they had planted in the last year for any of the five major foodcrops. For each of these, the varieties that have been introduced through the SoL program were listed, as well as the most common varieties of those crops that farmers plant in Timor-Leste. Apart from the source of the seeds or the cuttings, the farmers were also asked how long they have been using the seed, why they selected the variety, and if they intend to plant the same variety

[2] In 88% of the cases, the interviews were conducted in Tetun. In Oecussi, 90% of the interviews were conducted in Baiqueno; 25% of the interviews in Lautem were done using Fataluku; and 16% of the interviews in Baucau were conducted using Macasae.

again. If not, for what reasons would they not do so. Specifically for the MAF/SoL varieties, the respondents were also asked to compare the productivity of the MAF/SoL variety with a local variety.

This data provides important information on the extent to which MAF/SoL varieties are already used by farmers throughout the country, how the farmers had obtained such seeds or cuttings, and the extent to which they like or dislike growing them.

The next sub-section asked if there were **foodcrop varieties the household used to grow** in the last two years which they no longer grow now. If yes, what were these varieties and why did they discontinue their use? The main reason for this question was to assess if there were farmers who had cultivated MAF/SoL varieties previously, and what the reasons were for not replanting them.

The questionnaire also included a section on **assessment of the rainfall pattern and corn growth** during the last season. The section was intended for the corn farmers who reported that they did not intend to replant a corn variety because production was too low, but the field interviewers ended up asking the question to other corn farmers as well. This data can be used to assess to what degree the reported drought and stunted growth of maize can be corroborated with known rainfall data.

There was also a set of **additional questions for corn growers**, touching upon who in the household decides on the choice of the corn varieties to plant and the selection of the seed; how many corn seed grains are placed in a planting hole; whether the household belongs to a farmers' group, and if the group engages in the selling of seed; and if they are familiar with seed fairs. Such information is important to assess to what extent corn farmers are familiar with certain farming techniques, and who should be targeted for extension related to corn variety selection and corn seed selection.

The next sub-section asked farmers **how much seed** material or cuttings they had used in the last planting season. This data can be used to assess the reliability of the data reported on production.

The final sub-section of this part relates to the **storage of corn for food and seed**. The farmers were asked how they stored corn for food and seed, what the reasons for the choice were, and how much the losses of stored corn were with these methods. To assist the respondents in estimating the losses, they were shown 20 grains of corn and asked "*If this represents the total amount you stored, how much of it was lost storing the corn with this method?*".

7. Familiarity with Seeds of Life

The respondents were asked if they had ever heard about "Seeds of Life", and if yes how long ago they first heard of it, and how. They were also asked if they, or another household member, had ever been involved in a SoL activity, or if they knew someone who grows a Seeds of Life foodcrop variety.

8. Household food self-sufficiency

Many farmers in Timor-Leste are not capable to produce sufficient food to meet their households' food need for the full year. To gain a better understanding of the current status of food self-sufficiency, the farmers were asked several food related questions.

First of all, they were asked during which months in the last year they had been able to consume food from the corn, rice, peanut, cassava and/or sweet potato they had cultivated themselves.

Secondly, they were asked during which months they gathered and consumed wild foods such as wild yam (*kumbili*), elephant foot's yam {*maek*), wild bean {*koto fuik*), arrowroot {*kontas*), etc.

Since rice is increasingly becoming a preferred food item, the respondents were also asked in which months of the last year the household had bought rice for food, and how much rice had been bought on such occasions.

A related question was how much – if any – rice, corn, beans, cassava and/or sweet potato the household had bought for food in the previous 30 days.

A final set of questions in this part on food self-sufficiency were the nine questions of the household food insecurity access scale (HFIAS) to assess to what extent the household was concerned about food availability, or had to take recourse to one or more coping mechanisms to address food shortages.

9. Farming tools and farm equipment

The farmers were asked whether or not they possessed certain types of agricultural tools, and if yes, how many. The possession, or non-possession, of agricultural tools, together with information on the housing condition and the ownership of household amenities provides information on the socio-economic status of the household.

10. Housing and household amenities

The field interviewers were asked to observe what the main materials of construction of the external walls, the roof and the floor of the houses were. They also asked the respondents whether or not they owned certain types of common, and not-so-common, household items.

11. Agricultural extension and participation in community activities

The final part of the questionnaire asked the respondents on their knowledge of, and interaction with, the agricultural extension services, and the type of services they had received – if any – during the past six months.

The respondents were also asked if they, or members of their household, participated in one or more types of groups (and, if yes, what groups), and if they, or member of the household, had participated in training activities (and, if yes, what types of training).

1.4 Data Collection and Field Monitoring

The data collection in the 100 sucos was done by 11 teams who were selected and contracted by the National Directorate of Statistics (DNE). Each team consisted of a field supervisor, three field interviewers and a driver. During the first week of October 2011, all field interviewers and supervisors received orientation on the questionnaire, and conducted practice interviews in sucos in Liquiça that were not part of the sample. On 10 October, all

teams departed for their respective districts, and data collection started the following day[3]. The data collected was completed by 28 October (see Vol. 3, Annex 2 for detailed information on the data collection in the sucos). The data collection took on average two days per suco, but in several sucos – especially if the houses were located close together, and the farmers only cultivated one or two crops – data collection could be completed in one day.

The choice of using temporary survey staff contracted by DNE, instead of MAF staff, for the baseline survey was influenced by the following considerations:

- **Experience**. Nearly all the field interviewers and field supervisors contracted by DNE had previous experience with census or survey data collection. Even so, during monitoring of the data collection, it was found that some questionnaires were incomplete or incorrectly filled-in (especially in the sections on areas of cultivated plots, production and use of seeds).
- **Timeliness of completion of data collection**. With 11 teams in the field, it was possible to complete the data collection in a three week period. There was thus little difference in the recall periods from the respondents in the 13 districts.
- **Cost**. The government regulations on per diem allowances for civil servants would have made it impossible to complete the survey within the same period, or for the same cost[4]. Because the field interviewers, field supervisors and drivers were not civil servants, they were willing to accept a lump sum compensation which was about a third of what one month of per diem allowances would have amounted to.
- **Objectivity**. The field interviewers and field supervisors did not have an institutional link with MAF. They may therefore have recorded answers of respondents more objectively than a staff of an agriculture office would have done if he thought that a less positive response would have reflected badly on his, or his agency's performance. The drawback was that some field interviewers and supervisors were perhaps not that familiar with the subject of agriculture, and therefore were less capable to discern between plausible and inplausible answers.

When a team arrived in a suco, it first made contact with the Chefe de Suco and handed over a letter from MAF regarding the purpose of the survey[5]. Possible difficulties to implement the survey (e.g. inaccessibility due to flooding rivers, unavailability of respondents due to local ceremonies) were also discussed at that time. Only two of the original 100 sucos were replaced with another suco:

- In Baucau, sub-district Baguia, suco Lari-Sula was replaced by suco Haeconi, because the first one was too difficult to reach because of the rains.

[3] For follow-up surveys, it may be better to have all teams working together in one district first. In that way, weaknesses or mistakes in interview techniques or in completing the questionnaires can be identified and addressed early on. It will help to improve the quality of the data collection in the other districts.

[4] In December 2010, the government increased the per diem allowance of a mid-level civil servant from US $ 25 per day to US $ 40 per day. The number of consecutive days in which a civil servant may receive such per diem payments is limited to 14 days.

[5] The Ministry of State Administration and Territorial Organization (MAEOT) had been contacted prior to the survey and had apparently issued a letter to the districts, sub-districts and sucos, informing them about the baseline survey. MAF/SoL did unfortunately not obtain a copy of that letter.

- In Covalima, sub-district Fohorem, suco Lactos was replaced by suco Dato Rua. The Chefe de Suco of Lactos did not want the survey to be conducted in the suco because there wasn't an authorization letter from MAEOT, and the MAF extensionist allegedly did not work well in that suco.

In the selected aldeias, the team met with the Chefe de Aldeia and explained the purpose of the survey. At that time the to-be-interviewed households were selected. In the center of the aldeia, a disk with three arrows (Figure 2) was thrown up, and the way it landed indicated the three directions in which the field interviewers would set off to locate respondent households. To determine which house they should stop at, a dice was thrown. This method introduced a degree of randomness in the selection of the households to be interviewed.

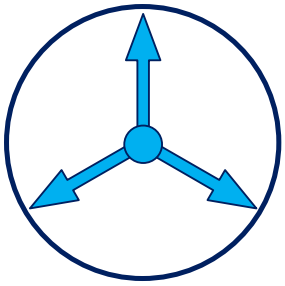


Figure 2. Disk to select Sample Households

The interviews were conducted by the three field interviewers, and the field supervisor checked if the questionnaires were correctly and completely filled in. If mistakes were noticed, the field interviewers corrected them based on their recollection, and sometimes even went back to the households to obtain additional data.

The Seeds of Life Social Science and M&E team, together with the Baseline Survey Assistant, monitored data collection by the DNE teams, and checked already completed questionnaires. The field supervisors of the 11 teams had been asked to send a daily SMS to the Baseline Survey Assistant to keep her informed of progress and possible difficulties with the survey implementation. Ten staff from three MAF directorates joined the monitoring teams for one week, to observe how the data collection was being done.

1.5 Data Entry, Cleaning and Analysis

A team of 11 data entry officers, supervised by two data editors, entered the questionnaire data into electronic format. This was done at the DNE office in Dili. To make data entry easier, a MS Access application was developed which mirrored the questionnaires.

The data entry team mobilized one week after the survey teams started the data collection in the sucos, and they entered the completed and checked questionnaires as they were received in Dili. At the end of the field survey, the field teams also spent some time at the DNE office in Dili, to assist in checking the questionnaires and to clarify unclear entries.

After data entry was completed, the data entry application developer converted the MS Access data into spreadsheets, and performed a first check of the raw data. This identified a range of potentially incomplete or incorrect records. A small team of data entry officers was therefore contracted for an additional week to recheck these questionnaires.

Descriptive data analysis, producing summary statistics, and correlation analysis was done with MS Excel and GenStat Discovery (Edition 4). During the data analysis, more mistakes in data entry and missing data records were identified. The original questionnaires were checked if they had more complete or different data, and if so, the data file was corrected.

2. Survey Findings

2.1 Household Demographic and Socio-Economic Characteristics

2.1.1 Sample Households

The baseline data was obtained from 1,799 households in 100 sucos in the 13 districts[6]. A total of 1,660 (92%) of the households were headed by a male, and 139 households (8%) were female-headed[7]. The percentage of female-headed households in the SoL baseline survey sample was lower than in the 2010 population census (8% vs. 16%). The information on these households were obtained from 1,129 male respondents and 670 female respondents.

Table 2 gives some summary characteristics of the surveyed population.

Table 2. Characteristics of the Surveyed Population

Characteristic	Number	%
Number of visited households	1,799	100%
• Male-headed households	1,660	92%
• Female-headed households	139	8%
• Male respondents	1,129	63%
• Female respondents	670	37%
Age of head of household (year)		
• Minimum	20	
• 25th percentile	38	
• Median age	47	
• 75th percentile	60	
• Maximum	87	
Number of household members		
• Minimum	1	
• 25th percentile	5	
• Median number of household members	6	
• 75th percentile	8	
• Maximum	24	

Regarding the age of the head of household, 22% of the sample was aged between 30-39 years, and 28% was aged between 40-49 years.

Most of the sample households had between five to ten members; 805 (45%) had between 5-7 persons, and 472 (26%) had between 8-10 persons. The female-headed households (FHH) were commonly smaller than the male-headed households (MHH); on average FHHs had 5.5 members whereas MHHs had 6.8 members. The average household size of the households

[6] A total of 1,800 interviews were conducted, but one questionnaire (from suco Laisorolai de Cima, in Baucau district) was subsequently lost.

[7] The identification of male and female headed households was made on the basis of the information provided by the respondent. If she or he said that the "head of household" was a man, the household was identified as "male headed". Conversely, if the respondent stated that a woman headed the household, the household was identified as "female headed". No specific questions were asked to verify the provided information. Tables with more detailed information are provided in Volume 2.

included in the SoL baseline survey was consistently larger than that of the rural households in the 2010 census.

The majority of the heads of housesholds (53%) reported not to have attended school; this corresponded to 52% of the MHHs and 71% of the FHHs. The 2010 census found that 50% of the adults aged 25 and above reported never to have attended school, with the percentage for males being 42% and for females being 57%[8]. More detailed information on education levels of the heads of housesholds (HoHs) is given in Table 3 below.

Table 3. Highest Level of Education of Heads of Sample Households, by Gender

Highest level of education	Male		Female		Total	
	Number	%	Number	%	Number	%
No schooling	861	52%	99	71%	960	53%
Attended Primary	242	15%	17	12%	259	14%
Completed Primary	183	11%	9	6%	192	11%
Attended Junior High School	53	3%	3	2%	56	3%
Completed Junior High School	115	7%	6	4%	121	7%
Attended Senior High School	32	2%	1	1%	33	2%
Completed Senior High School	158	10%	3	2%	161	9%
Higher education (attended/completed)	15	1%	1	1%	16	1%
Total	1,659		139		1,798	

2.1.2 Ownership of Amenities, Farming Tools and Farm Equipment

The surveyed households were asked what type of household amenities in *workable/usable* condition they had. For some of these items the results can be compared with those of the 2010 census (see Table 4).

Table 4. Ownership of Household Amenities

Household item(s) in workable/usable condition	Total		Timor-Leste Census 2010 (Rural)
	Number	Percent	
Table	1499	83%	—
Chairs (plastic, wood)	1450	81%	—
Telephone / mobile	887	49%	43.2%
Radio	400	22%	28.5%
Television	174	10%	10.9%
Motorcycle	130	7%	7.4%
Bicycle	94	5%	7.3%
Boat	33	2%	2.5%
Sewing machine	30	2%	—
Refrigerator / freezer	19	1.1%	3.2%
Car / van / angguna	9	0.5%	2.1%

[8] Based on Table 2 (Population five years and over by sex, schooling status, district and age) in Timor-Leste Census 2010, Volume 3

It is noticeable that the ownership of mobile telephones reported in the baseline survey is markedly higher than that reported in the census (which was conducted a year earlier). For some of the other household amenities, ownership in the baseline survey is less than that reported in the 2010 census. This may in part be due to formulation of the question; the SoL baseline asked specifically for amenities in *workable/usable* condition, whereas this qualifier was not included in the censsus.

As the surveyed households engage in agriculture, the majority of them own some farming tools or farming equipment. Table 5 below shows the number and percentage of households that had certain farming tools and farm equipment in workable condition, the *machete* being the most commonly owned farming tool.

Table 5. Ownership of Farming Tools and Farm Equipment

	Total	
Farming tool(s) in workable condition	Number of households	Percentage
Big knife / machete	1,741	97%
Pick	1,622	90%
Planting stick	1,437	80%
Hoe	1,068	59%
Shovel	931	52%
Axe	775	43%
Crop drying area	647	36%
Tarpaulin/canvass	556	31%
Sickle / reaping hook	483	27%
Drum / bidon	433	24%
Water can	251	14%
Ox-cart	126	7%
Wheelbarrow	98	5%
Hand-operated sprayer	43	2%
Silo	31	2%
Hand tractor	21	1%
Corn sheller	7	0.4%

Of the 433 households that reported owning a drum, 397 were corn growers. Of these 397, only 146 (37%) mentioned "saving corn in a drum" as a way to store corn. It may thus be that most of the drums were used for other storage purposes (with drums being used to store water probably being a frequent occurrence)[9].

[9] There were also 58 corn growers who reported saving seed and/or food in a drum, but who did not acknowledge owning a drum in a later section of the interview.

2.1.3 Housing Condition

During the visits to the sample households, the enumerators also made observations on the housing condition. Table 6 shows the conditions of the roof, the external walls and the floor of the sample households. The column to the right compares the results of the Seeds of Life baseline survey with the housing condition of the rural households, as reported in the 2010 census.

Table 6. Housing Condition

Housing condition		Total		Timor-Leste Census 2010 (Rural)
		Number of households	Percent	
Roof	# of records	1,785		
Corrugated iron		1,109	62%	58.5%
Palm leaves / Talitahan / Thatch / Grass		632	35%	37.9%
Bamboo		31	2%	1.5%
Concrete		5	0.3%	0.2%
Asbestos		4	0.2%	1.2%
Tiles		3	0.2%	0.5%
Tarpaulin / plastic		1	0.1%	
External walls	# of records	1,758		
Palm trunk (bebak)		735	42%	31.0%
Bamboo		625	36%	40.3%
Concrete / brick		276	16%	17.4%
Wood		38	2%	4.2%
Corrugated iron		34	2%	3.0%
Rock		28	2%	1.5%
Clay / soil		20	1%	1.6%
No walls		2	0.1%	
Floor	# of records	1,790		
Soil / clay / mud		1379	77%	71.8%
Concrete		328	18%	17.3%
Wood		64	4%	1.6%
Tile / stone		19	1%	2.7%

Judging from the conditions of floors and walls (Table 6), the sample households in the SoL baseline survey may on average have been poorer than the average rural household of the 2010 census, but a higher percentage had better quality roofing.

For floors, the percentage of wooden floors in the SoL baseline survey was larger than in the 2010 census. The census did however distinguish between “wood” and “bamboo” (with respectively 1.6% and 3.5% of the rural households). In the SoL baseline survey, bamboo flooring was counted as “wood”.

2.2 Crops cultivated and Land Usage

2.2.1 Cultivation of Five Foodcrops

At the start of the interview, each respondent was asked if the household had cultivated one or more of the following crops between October 2010 and September 2011: corn, rice, peanut, cassava and sweet potato. If the answer to at least one of these crops was 'yes', the interview with the household was continued; if not – but this was hardly ever the case – another household was selected. Table 7 shows the percentage of households in each district that cultivated one or more of the five crops.

Table 7. Cultivation of Five Foodcrops by Survey Sample Households

District	Number of respondents	Percentage of respondents cultivating this crop				
		Corn	Rice	Peanut	Sweet Potato	Cassava
Ainaro	108	69%	6%	13%	82%	68%
Aileu	90	57%	24%	1%	41%	79%
Baucau	233	48%	64%	11%	64%	71%
Bobonaro	180	98%	39%	39%	36%	92%
Covalima	126	89%	26%	8%	21%	83%
Dili	90	60%			13%	74%
Ermera	234	90%	17%	10%	59%	89%
Liquiça	126	87%		32%	44%	96%
Lautem	126	97%	32%	23%	67%	90%
Manufahi	90	100%	20%	33%	89%	94%
Manatuto	72	100%	79%	47%	65%	90%
Oecussi	162	100%	90%	47%	53%	83%
Viqueque	162	86%	65%	33%	66%	84%
Total # and	1,799	1,485	687	406	977	1,510
% of farmers		83%	38%	23%	54%	84%

The percentages of households growing corn, rice or cassava are comparable with the findings of the 2010 census. According to the census, the percentages of households engaged in the cultivation of corn, rice and cassava compared to the total number of households engaged in crop production are respectively 88%, 39% and 81%. The baseline survey has a somewhat lower percentage of corn growers (83%), basically the same percentage of rice growers, and a slightly higher percentage (84%) of cassava growers. The percentages of respondents who grow corn in Aileu (57%) and Baucau (48%) are lower than expected.

For the rice farmers, it is also worthwhile to check how many grew irrigated rice and how many non-irrigated rice. Of the 676 rice farmers for whom the data is available, 59% only grew irrigated rice, 39% grew non-irrigated rice, and 3% cultivated plots with irrigated and non-irrigated rice (see Table 8).

Table 8. Number of Farmers growing Irrigated and Non-Irrigated Rice

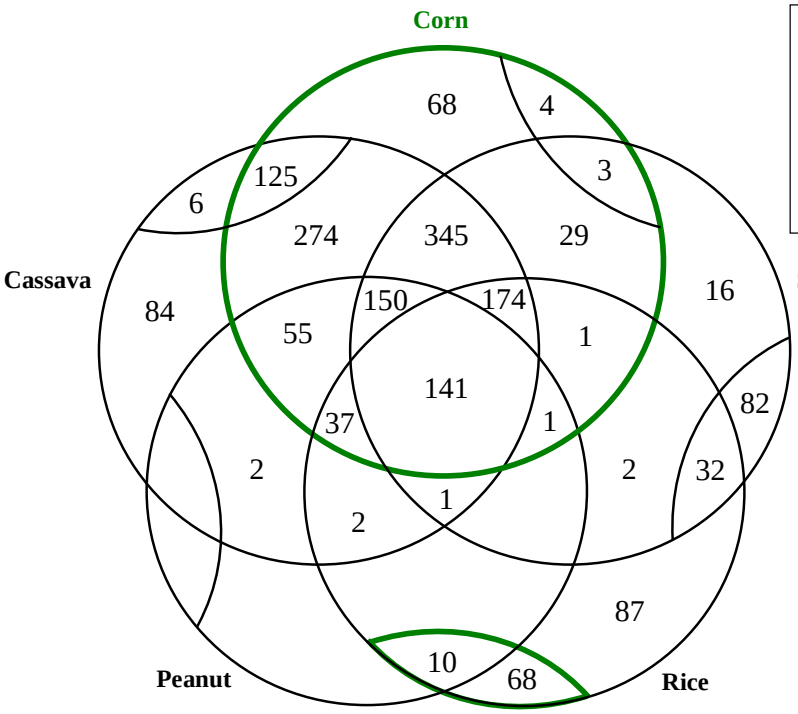
Number of rice farmers	Irrigated rice only	Non irrigated rice only	Irrigated and non-irrigated rice
676	397	261	18
	59%	39%	3%

Of the 1,440 corn farmers for whom the data is available, 98% only grew non-irrigated corn, 2% grew corn with irrigation, and only five farmers cultivated plots with irrigated and non-irrigated corn (see Table 9).

Table 9. Number of Farmers growing Irrigated and Non-Irrigated Corn

Number of corn farmers	Corn grown on irrigated plots only	Corn grown on non irrigated plots only	Corn grown on irrigated and non-irrigated plots
1,440	25 2%	1,410 98%	5 0.3%

The combination of crops cultivated by the respondent households for the five foodcrops is shown in Figure 3. Each segment in the graph represents a single crop, or a combination of two, three, four or the five crops (the intersection in the middle of the graph).



Legend
The information on combination of crops for each of the five crops is represented by two areas in the graph: a full circle, and the segment opposite it.

Crop combinations of Corn (Co) with Cassava (Ca), Peanut (P), Rice (R) and Sweet Potato (SP)

68	Co
4	Co + P
125	Co + Ca + R
3	Co + P + SP
274	Co + Ca
345	Co + Ca + SP
29	Co + SP
55	Co + Ca + P
150	Co + Ca + P + SP
174	Co + Ca + R + SP
1	Co + R + SP
141	Co + Ca + P + R + SP
37	Co + Ca + P + R
1	Co + P + R + SP
10	Co + P + R
68	Co + R
1,485	**Corn growers**

Figure 3. Cultivation of five foodcrops by survey sample households

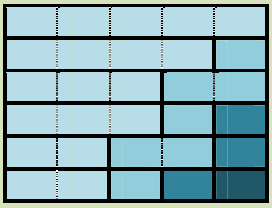
Figure 3 shows that the crop combinations which include corn are the most popular. The combination of corn, cassava and sweet potato was encountered with 345 households (19%), and the combination of corn and cassava was grown by 274 households (15%). Only 255 households (14%) grew a single crop, with none growing only peanut.

Box 1: Checking within-questionnaire data consistency on the five main crops

In the questionnaire, there are five occurrences where information is sought from the respondents which of the five main crops they cultivate:

1. At the start of the interview, to assess the eligibility of the respondent (only respondents who cultivated at least one of the five main crops were interviewed);
2. In the section asking what crops were grown during the last year on the plots of land the household cultivated;
3. In the section on the crops harvested in the last year;
4. In the section on the amount of seed used in the last year;
5. In the section on food sufficiency of the self-grown crops.

Ideally, the answers on crops grown should be consistent between the different parts of the same questionnaire. This was however not the case. For the 1,799 questionnaires, the consistency of the answers on the five major crops was as follows:



All five occurences the same	1,061	HHs	59%
Four the same; one different	627	HHs	35%
Three the same; two the same	9	HHs	1%
Three the same; two different	88	HHs	5%
Two x two the same; one different	6	HHs	0.3%
Two the same; three different	8	HHs	0.4%

For 59% of the questionnaires (1,061 respondents), the answers on crops grown were consistent. For another 35% of the questionnaires, only one of the five mentioned crop combinations was different from the other four. For 5% of the questionnaires, three of the crop combinations were the same, but the other two were different, both from the other three, and between the two of them (missing answers were counted as being different from the other answers).

The inconsistencies can be due to errors of notation during the field survey (i.e. the interviewers not checking on the consistency of the answers given for one section with the answer given previously for another section), or to errors during data entry (i.e. the data entry staff not entering all, or not entering correctly, the data from the questionnaires into the electronic record).

To determine the crop combinations of Table 7 and Figure 3, the most likely combination was selected as the correct answer.

2.2.2 Main Crops Cultivated and Production

Most of the farmers grow more than one foodcrop per farming plot, and up to four crops per plot is quite common. Table 10 shows the number of main crops cultivated per plot by percentage of plots cultivated in each district. In Dili, more than three-quarters of the cultivated plots only have one or two crops per plot. In several districts (Baucau, Lautem, Manufahi, Manatuto, Viqueque) the percentage of plots where two crops are grown is less than the number of plots with one crop, or that of three or more crops per plot.

Table 10. Number of Main Crops Cultivated per Farming Plot

District	Number of plots cultivated	Number of main crops cultivated per farming plot (% of plots cultivated in the district with this number of crops)							
		One	Two	Three	Four	Five	Six	Seven	Eight
Ainaro	126	10%	21%	16%	18%	13%	15%	6%	2%
Aileu	109	39%	15%	10%	9%	9%	8%	6%	4%
Baucau	331	50%	14%	20%	9%	4%	2%	0.6%	0.6%
Bobonaro	277	39%	29%	19%	13%				
Covalima	139	27%	50%	19%	3%				
Dili	105	56%	26%	16%	2%				
Ermera	270	17%	29%	34%	13%	5%	0.7%	0.4%	
Liquiça	126	13%	33%	37%	17%				
Lautem	159	27%	14%	39%	17%	3%			
Manufahi	108	19%	6%	39%	25%	9%	0.9%		
Manatuto	127	46%	9%	17%	18%	7%	4%		
Oecussi	275	25%	21%	20%	20%	13%	1.5%		
Viqueque	254	46%	9%	24%	17%	5%			
Total	2,406	794	508	572	339	122	47	16	8
		33%	21%	24%	14%	5%	2%	0.7%	0.3%
Male-headed HHs	2,214	728	464	518	319	117	46	14	8
		33%	21%	23%	14%	5%	2%	0.6%	0.4%
Female-headed HHs	192	66	44	54	20	5	1	2	
		34%	23%	28%	10%	3%	0.5%	1.0%	

The pattern in number of main crops grown per farming plot by male-headed households or female-headed households is fairly similar.

The respondents were asked how much production they obtained in the last year from each of the five main foodcrops, and whether this was from irrigated or non-irrigated plots. The farmers mentioned the size of the harvest in the units they normally use (e.g. 25, 35, 50 kg sacks; 200g, 5 l, 12 l cans; various sizes of tied together corn cobs), and this data was later converted in kg equivalents using a conversion table (see Vol. 3, Annex 5).

Table 11 shows what production the surveyed farmers had for each of the five major foodcrops, the average size of the crop and the maximum crop obtained. The amounts reported for cassava and sweet potato by the farmers will in many cases only have been estimations; these crops are normally not harvested in a short time span (a few days to a week), but are ocassionally dug up, when they are to be consumed or sold.

Table 11. Production of Main Crops

Crop	Crop production during October 2010 – September 2011 (Number and % of respondents growing the crop)									Average harvest (kg)	Maximum harvest (kg)
	No harvest	Less than 10 kg	10 to < 25 kg	25 to < 50 kg	50 to < 100 kg	100 to < 200 kg	200 to < 500 kg	500 to < 1,000 kg	More than 1000 kg		
Corn	6	28	104	181	279	310	347	141	71	287	6,300
	0.4%	2%	7%	12%	19%	21%	24%	10%	5%		
Irrigated rice	3		1	10	26	56	112	93	132	821	8,000
	0.7%		0.2%	2%	6%	13%	26%	21%	30%		
Upland rice			8	33	43	54	67	31	22	340	2,700
			3%	13%	17%	21%	26%	12%	9%		
Peanut	3	7	102	140	95	42	18	8	2	75	2,660
	0.7%	2%	24%	34%	23%	10%	4%	2%	0.5%		
Cassava	10	16	14	14	263	339	508	209	114	370	5,360
	0.7%	1%	0.9%	0.9%	18%	23%	34%	14%	8%		
Sweet potato	6	26	14	235	259	244	144	32	9	149	3,000
	0.6%	3%	1%	24%	27%	25%	15%	3%	0.9%		

2.2.3 Crop Damages and Losses, and their Causes

Crop damages and losses are a frequent occurrence for the majority of the farmers. Table 12 shows that more than 80% of all farmers experienced crop damage. The damages were the highest for corn (88% of corn farmers), rice (87%) and cassava (87%). For all crops, damages by animals – either domestic livestock and dogs, rodents or wild animals – are the most important sources of losses. Locusts, and pest and diseases, are most important for rice, both irrigated and non-irrigated. In the reported period (October 2010 – September 2011) the losses due to excess of rain were also larger than those due to a lack of rain.

Table 12. Crop Damages and Losses

	Corn		Rice		Peanut	Sweet Potato	Cassava
	Irrigated	Non-irrigated	Irrigated	Non-irrigated	Non-irrigated	Non-irrigated	Non-irrigated
# of farmers reporting losses	21	1,277	387	215	340	817	1,296
% of farmers growing the crop (irrigated + non-irrigated) reporting losses or damages	1%	87%	56%	31%	82%	84%	87%
Most important causes of damage or loss to crops (% of reported cases of losses or damages)							
Total # of causes mentioned by respondents	33	1,910	621	374	454	1,151	1,865
Domestic livestock and dogs	39%	15%	14%	7%	14%	11%	13%
Rodents (rats and mice)	30%	31%	36%	38%	37%	32%	30%
Other wild animals	15%	31%	8%	10%	30%	36%	42%
Locusts		1%	11%	9%	1%	1%	1%
Other pests & diseases	3%	2%	14%	7%	1%	4%	2%
Fire		0.3%		0.3%		0.2%	0.3%
Too much rain	9%	16%	14%	21%	12%	13%	10%
Too little rain	3%	3%	2%	6%	4%	1%	2%
Theft		0.1%			0.4%	0.4%	0.3%
Other cause of damage		1%	2%	0.3%	0.2%	0.3%	0.2%

2.2.4 Farming Plots Sizes and Number of Crops Grown

The sizes of the cultivated farming plots fall into two clusters (see Table 13). Close to 60% are relatively small sized plots with an average size of 0.3 ha, and 40% are plots that are on average larger than 1 ha.

Table 13. Size of Farming Plots used for Cultivation of Foodcrops

District	Size of farming plots used for cultivation of foodcrops, Oct '10 – Sep '11 (% of plots cultivated by the respondents)						
	< 0.25 ha	0.25-0.49 ha	0.5-0.74 ha	0.75-0.99 ha	1-1.49 ha	1.5-1.99 ha	> 2 ha
Total	370	800	258	58	766	26	128
	15%	33%	11%	2%	32%	1%	5%
Male-headed HHs	332	729	233	52	719	23	123
	15%	33%	11%	2%	33%	1%	6%
Female-headed HHs	37	70	25	6	47	3	5
	19%	36%	13%	3%	24%	2%	3%

When looking specifically at corn growers, 62% of them grew corn on plots that were less than 0.8 ha, which is considered the area necessary to grow sufficient corn to feed an average household of six persons during one year (as quoted in Oxfam, 2007:22). The majority of these households also grew other crops, but most of the fields were cultivated with

intercropping or relay cropping, and the net equivalent area for corn would thus be smaller than the plot area.

The majority of the farmers (70%) cultivate only one plot for foodcrops, and less than 3% of the farmers cultivate more than two plots for foodcrops (see Table 14).

Table 14. Number of Farming Plots cultivated per Farmer for Foodcrops

Number of farming plots cultivated per farmer for foodcrops (Number and % of respondents)				
One	Two	Three	Four	Five
1,254	499	31	14	1
70%	28%	2%	0.8%	0.1%

Table 15 shows the average number of plots cultivated per farmer in each of the districts, and gives the correlation coefficient between the number of crops and plot sizes, and between the number of crops and the number of plots.

Table 15. Correlation Analysis between Number of Crops Cultivated, Plot Sizes and Numbers of Plots

District	Number of respondents	Number of plots cultivated	Average # of plots cultivated by a farmer	Correlation between number of crops and …	
				Plot size	# of plots
Ainaro	108	126	1.17	0.0951	- 0.2052
Aileu	90	109	1.21	- 0.0031	- 0.3505
Baucau	233	331	1.42	- 0.1285	- 0.3700
Bobonaro	180	277	1.54	- 0.0015	- 0.2658
Covalima	126	139	1.10	- 0.0233	- 0.3347
Dili	90	105	1.17	- 0.1729	- 0.2187
Ermera	234	270	1.15	- 0.0133	- 0.1348
Liquiça	126	126	1.00	0.2565	0
Lautem	126	159	1.26	- 0.0323	- 0.6848
Manufahi	90	108	1.20	- 0.0819	- 0.6984
Manatuto	72	127	1.76	- 0.0302	- 0.1303
Oecussi	162	275	1.70	0.2266	- 0.5280
Viqueque	162	254	1.57	- 0.0150	- 0.6805
Total	1,799	2,406	1.34		

There is no pattern in the correlation, as the sign is not consistent within the districts. Plot sizes are not related to the number of crops, i.e. it is not strictly so that on larger plots farmers plant more crops. There is however a significant negative correlation between number of plots and number of crops in Lautem, Manufahi, Oecussi and Viqueque, which indicates that, as the number of plots managed by a farmer increases, fewer types of crops will be planted. As all respondents in Liquiça owned only one plot – or rather, reported as such –, a zero correlation was obtained.

2.2.5 Irrigated and Non-Irrigated Plots and Crops

The respondents were asked if the plots they used to cultivate foodcrops had been irrigated – either in part or in full – during the previous planting season. Of the 2,406 plots, 1,931 (80%) were non-irrigated and 437 (18%) were irrigated. For the other 38 plots (2%), either no information, or incorrect information, had been provided on whether or not the plot was irrigated. For the 2,368 plots for which the irrigation status is known, Table 16 shows which of the five main crops were cultivated on these.

Table 16. Irrigated and Non-Irrigated Plots, by Crop

	Corn		Rice		Peanut		Sweet potato		Cassava	
	Irri-gated	Non irri-gated	Irri-gated	Non irri-gated	Irri-gated	Non irri-gated	Irri-gated	Non irri-gated	Irri-gated	Non irri-gated
Total # of plots	32	1,504	421	308	7	393	17	951	24	1,489
% of irrigated plots	7%		96%		2%		4%		5%	
% of non-irr. plots		78%		16%		20%		49%		77%

The irrigated plots are primarily used to cultivate rice, as 96% of such plots are planted with this crop. This does however not mean that in Timor-Leste rice is predominantly cultivated on irrigated land; only 58% of the plots cultivated with rice were irrigated, 42% of the plots with rice were not irrigated.

The four other main crops (corn, peanut, sweet potato and cassava) are predominantly, but not exclusively, grown on non-irrigated land. The fact that, for those four crops, there are plots in the columns "irrigated" does not necessarily mean that these crops were grown under irrigation on those plots. The question asked to the farmers was: "*Was part or all of the parcel* [on which foodcrops were grown] *irrigated during the last cropping season*?". It may well be that any of the four crops were grown on a non-irrigated part of the plot, or were grown on the same plot but not simultaneously with the irrigated crop. This is supported by the fact that 18 of the 32 irrigated plots with corn also were used to grow irrigated rice. For the other crops, this was 5 of the 7 plots for peanut (71%), 11 of the 17 plots with sweet potato (65%), and 15 of the 24 plots with cassava (63%).

It is also interesting to look at the following three categories of farmers: those that only cultivated irrigated plots, those with only non-irrigated plots, and those that grew foodcrops on a combination of both. Table 17 shows that 5% of the farmers only grew foodcrops (predominantly paddy rice) on irrigated plots, 74% only on non-irrigated plots, and 18% of the farmers had both irrigated and non-irrigated plots.

Table 17. Number of Farmers growing Irrigated, Non-Irrigated and Mixed Crops

Total number of farmers in sample	Growing crops on irrigated plots only	Growing crops on non-irrigated plots only	Growing crops on irrigated and non-irrigated plots	Unknown
1,799	92 5%	1,334 74%	329 18%	44 2%

2.2.6 Travel Time from Homestead to Farming Plots

There is wide variation in the time needed to travel from the home to the farming plots. Overall some 17% of the farmers have one or more plots at, or very near to the house, and nearly 60% of the plots are less than an hour from the house (see Table 18). Percentage-wise, female-headed households have more farming plots close to the house than male-headed households (20% vs. 16%), but a substantial percentage of female-headed households also have farming plots at considerable distances from the house.

Table 18. Travel Time from Homestead to Farming Plots

District	Travel times from the homestead to farming plot (% of plots cultivated in the district)								
	< 5 min	5' to < 15'	15' to < 30'	30' to < 45'	45' to < 60'	60' to < 90'	90' to < 120'	120' to < 180'	3 hours, or more
Total	398	134	249	524	86	629	60	283	45
	17%	6%	10%	22%	4%	26%	2%	12%	2%
Male-headed HHs	360	116	227	485	79	583	58	264	43
	16%	5%	10%	22%	4%	26%	3%	12%	2%
Female-headed HHs	38	18	22	39	7	46	2	19	2
	20%	9%	11%	20%	4%	24%	1%	10%	1%

2.3 Seeds and Cuttings

2.3.1 MAF/SoL Varieties

All respondents were asked what varieties of seeds or cuttings they had planted for the corn, rice, peanut, sweet potato and cassava they had grown in the previous year. In the questionnaire, and for each crop, the data for the MAF/SoL released varieties appeared first, with other common varieties being listed below.

During data analysis, it appeared that there was an anomaly with the data from Viqueque, and to a lesser extent with the data from Lautem. Table 19 shows that, in Viqueque, for each of the five crops, every farmer who reported growing this crop was already growing the MAF/SoL variety. This is highly implausible. We assume that the information on the farmers growing the crop is correct, but that the data on the use of the MAF/SoL variety is incorrect[10]. Similarly for Lautem. This is a district where Seeds of Life does not have any field activities yet[11], and where any uptake of MAF/SoL varieties would have happened automatically, by interested farmers. Yet Lautem shows much higher percentages of MAF/SoL variety adoption for the five crops than reported for the other districts, including districts where SoL has been active for more than five years.

[10] The check on varieties of seeds planted, using data from another section of the baseline survey questionnaire, did not provide different information; only the boxes on seeds and cuttings related to MAF/SoL varieties had entries.

[11] The Seeds of Life presence in Lautem started in 2012, with the expansion of support for community seed production groups in this district.

To avoid that the implausible data from Viqueque and Lautem distorts the information for the country as a whole, the tables in this section will have two rows for totals; one row which gives the totals for all 13 districts, including Lautem and Viqueque, and one row with totals for 11 districts, excluding these two.

Table 19. MAF/SoL Varieties Adoption Rates, by Crop

District	Corn		Rice		Peanut		Cassava		Sweet potato	
	# of corn growers	Sele growers (%)	# of rice growers	Nakroma growers (%)	# of peanut growers	Utamua growers (%)	# of cassava growers	Ai-Luka growers (%)	# of sweet potato growers	Hohrae growers (%)
Ainaro	76	25%	6	0%	14	0%	73	1%	89	3%
Aileu	52	52%	22	18%	1	0%	70	0%	37	11%
Baucau	112	25%	148	24%	25	52%	165	8%	148	18%
Bobonaro	176	18%	72	15%	71	20%	162	8%	64	3%
Covalima	108	2%	33	3%	10	0%	101	4%	25	4%
Dili	54	19%	0	0%	0	0%	67	0%	12	0%
Ermera	210	9%	40	0%	23	0%	209	1%	134	0%
Liquiça	107	11%	0	0%	40	35%	121	2%	55	11%
Lautem	119	61%	39	33%	28	75%	98	19%	73	19%
Manufahi	90	7%	18	6%	30	23%	85	5%	79	8%
Manatuto	72	8%	57	5%	32	6%	62	0%	44	5%
Oecussi	162	0%	146	2%	73	1%	133	1%	81	0%
Viqueque	140	100%	104	100%	54	100%	136	100%	107	100%
Total for										
13 districts*	1.478	25%	685	26%	401	31%	1,482	13%	948	18%
11 districts**	1.219	13%	542	11%	319	16%	1,248	3%	768	7%

* The number of crop farmers listed in the table is smaller than the numbers reported in Table 7. The reason is that some crop grower records had inconclusive data. The respondent may have mentioned a source of seed, or a productivity comparison with other varieties, or a reason to select the variety, but none of the other requested data was provided, thus making it uncertain whether the crop was really planted by that farmer. Such farmers were not counted in the above table.

** The "11 districts" total does not include Viqueque and Lautem

Box 2: The names of the MAF/SoL varieties

The MAF/SoL varieties that have been approved for release by the government have been given East Timorese names. Some of the chosen names, however, have a generic meaning in some local languages, and the question "*Do you grow [variety]?*" could be understood by some respondents to mean "*Do you grow [crop]?*".

The MAF/SoL varieties for which such confusion can occur are:

Sele	In the Makasae language (spoken in Baucau and Lautem) and in the Fataluka language (spoken in Lautem), *teli* means corn. *Teli* and Sele differ little in pronunciation.
Utamua	Means "peanut" in Makasae.
Ai-Luka	Means "cassava" in Tetun Terik, which is common in the Southern part of Timor-Leste (Covalima, Manufahi, Manatuto, Viqueque).

For Nakroma and Hohrae, confusion is not likely. Nakroma was given the name of the newly acquired vessel which provides shipping services between Dili and Oecussi, and Dili and Atauro. Hohrae was named after an aldeia in Maubisse where the sweet potato had been trialled.

It is however likely that the figures for corn and rice in Table 19 are underestimations. During the latter part of SoL 2, and especially in 2009 and 2010, the seed grown by contract farmers was distributed by MAF to the farmers. Some of the sample survey farmers may have received and grown MAF/SoL varieties without being aware of it, and without acknowledging themselves as MAF/SoL variety growers.

Table 20. MAF/SoL Varieties Adoption Rates, Combined

District	Crop growers	MAF/SoL variety growers	% of crop growers
Ainaro	108	20	18.5%
Aileu	90	30	33.3%
Baucau	233	88	37.8%
Bobonaro	180	42	23.3%
Covalima	125	6	4.8%
Dili	90	10	11.1%
Ermera	234	20	8.5%
Liquiça	126	29	23.0%
Manufahi	90	14	15.6%
Manatuto	72	8	11.1%
Oecussi	162	3	1.9%
Total for 11 districts	1,510	270	17.9%

If one looks at the adoption of MAF/SoL varieties across the board – there are farmers who grow more than one MAF/SoL variety – then for the country overall, the adoption rate is 18%. As shown in Table 20, the four districts where dissemination of MAF/SoL variety has progressed the most are: Baucau (38%), Aileu (33%), Bobonaro (23%) and Liquiça (23%). In three districts, the uptake of MAF/SoL varieties is less than 10% (Oecusssi, Covalima and Ermera).

The uptake of MAF/SoL varieties by farmers is generally better with farmers who cultivate crops under irrigation than by those who practice non-irrigated foodcrop agriculture. As can be seen in Table 21, 34% of the farmers who grow foodcrops on irrigated plots only already used MAF/SoL varieties. For farmers who had both irrigated and non-irrigated plots, the uptake was 26%, and for farmers who grew foodcrops on non-irrigated plots, the uptake of MAF/SoL varieties was 15%.

Table 21. MAF/SoL Varieties Adoption Rates, by Irrigation Status of Farmers

	Farmers with irrigated plots	Farmers with non-irrigated plots	Farmers with irrigated & non-irrigated plots
# of farmers in 11 districts*	74	1,170	232
# of farmers growing MAF/SoL varieties	25	181	60
Adoption rate by farmers with that irrigation status	34%	15%	26%

* Without Viqueque and Lautem

Note: The table does not include farmers or MAF/SoL variety adopters of whom the irrigations status was unclear.

Figure 4 shows the uptake of MAF/SoL crop varieties by sub-district. If a farmer grows one or more MAF/SoL crop variety, she or he got counted. It shows that the five sub-districts with the highest uptake of such varieties were: Aileu Vila (72%), Laga (67%), Baguia (64%), Vemase (56%) and Atabae (44%).

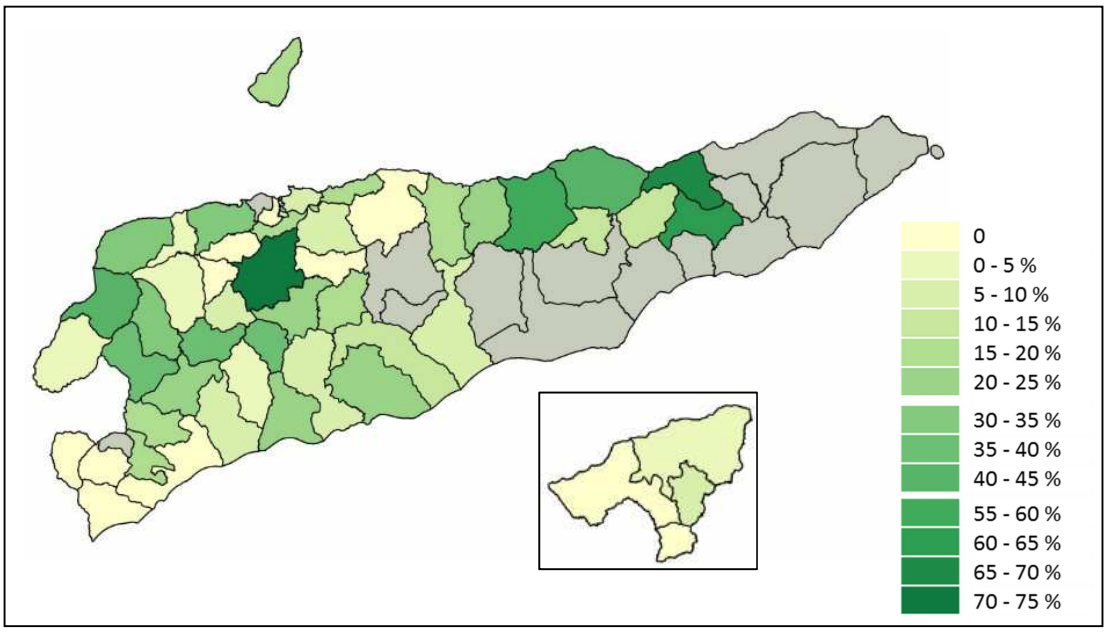


Figure 4. Sub-district uptake of MAF/SoL crop varieties

Apart from the sub-districts in Viqueque and Lautem, which were not included because of unreliability of the MAF/SoL variety uptake data, there are also some other sub-districts marked in grey. This is because no sucos of these sub-districts were included in the baseline survey sample.

2.3.2 Corn

Corn is a key staple crop for most farmers in Timor-Leste, grown by 83% of the farmers. and 69% of them only grow one variety (see Table 22). The two most popular varieties are *batar bo'ot* (grown by 67% of the corn farmers) and *batar lais* (46%)[12]. The Sele variety is currently grown by 13% of the farmers.

Table 22. Corn Varieties Planted

District	Number of farmers planting corn, and % of farmers in the sample		Corn variety planted (# of farmers in district)							Number of varieties planted (# of farmers in district)			
	Number	%	Sele	Batar lais	Batar bo'ot	Suwan 5	Arjuna	Kalinga	Other *	One	Two	Three	Four
Ainaro	76	70%	19	43	33				9	49	26	1	
Aileu	52	58%	27	18	38		2		2	19	31	2	
Baucau	112	48%	28	24	51		36	1	13	72	39	1	
Bobonaro	176	98%	32	96	124		2		1	107	60	8	1
Covalima	108	86%	2	16	94		2			102	6		
Dili	54	60%	10	36	34		1	1	1	29	21	4	
Ermera	210	90%	18	127	102			2	2	171	37	2	
Liquiça	107	85%	12	87	69			4	1	44	60	3	
Lautem	119	94%	73	42	38	3	31			55	60	4	
Manufahi	90	100%	6	50	60	1				63	27		
Manatuto	72	100%	6	46	49	1	1			43	27	2	
Oecussi	162	100%		18	160		6			140	22		
Viqueque	140	86%	140							140			
Total (13 Dist.)	1.478	82%	373	603	852	5	81	8	29	1.034	416	27	1
Total (11 Dist.) **	1.219	81%	160 13%	561 46%	814 67%	2 0.2%	50 4%	8 1%	29 2%	839 69%	356 29%	23 2%	1 0.1%

* The category "Other" also includes varieties of which the respondent did not remember the name.
** Without Viqueque and Lautem

It is also interesting to check how the *batar bo'ot, batar lais* and Sele corn growers relate to each other. *Batar bo'ot* and *batar lais* are often grown together. *Batar lais* is a short season corn that can be grown in three months; it is often grown close to the house and is the first cereal to be harvested during the wet season . *Batar bo'ot* takes normally four months from planting to harvest. Of the 1,219 corn growers in the 11 districts, 1,184 were growing *batar bo'ot, batar lais*, Sele, or a combination of the three. Figure 5 shows the percentages of those 1,184 farmers by crop combination grown.

[12] *Batar bo'ot* and *batar lais* are not single varieties; they are generic names for "big corn" and "quick [growing] corn"

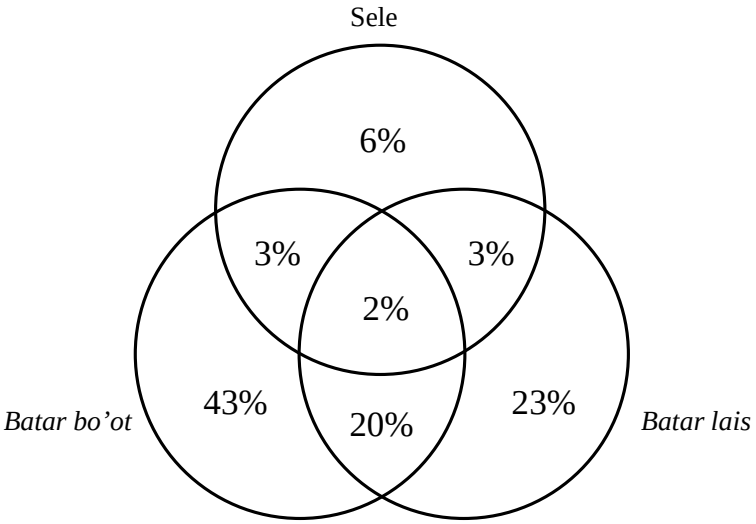


Figure 5. *Batar bo'ot*, *batar lais* and Sele growers (11 districts)

About one third of the farmers who grow *batar bo'ot* also grow *batar lais*. The number of farmers that grow Sele in combination with *batar bo'ot* is similar to the number of farmers who grow Sele with *batar lais*.

a) Sele

In 2011, Sele was grown by 13% of the corn farmers, but – as shown in Figure 6 – there were big differences between the districts. If one ignores Viqueque and Lautem for the reason mentioned above, Sele is already well established in Aileu (grown by 52% of the corn farmers there), and by 25% of corn farmers in Ainaro and Baucau. The two districts where Sele is grown the least are Oecussi (0%) and Covalima (2%).

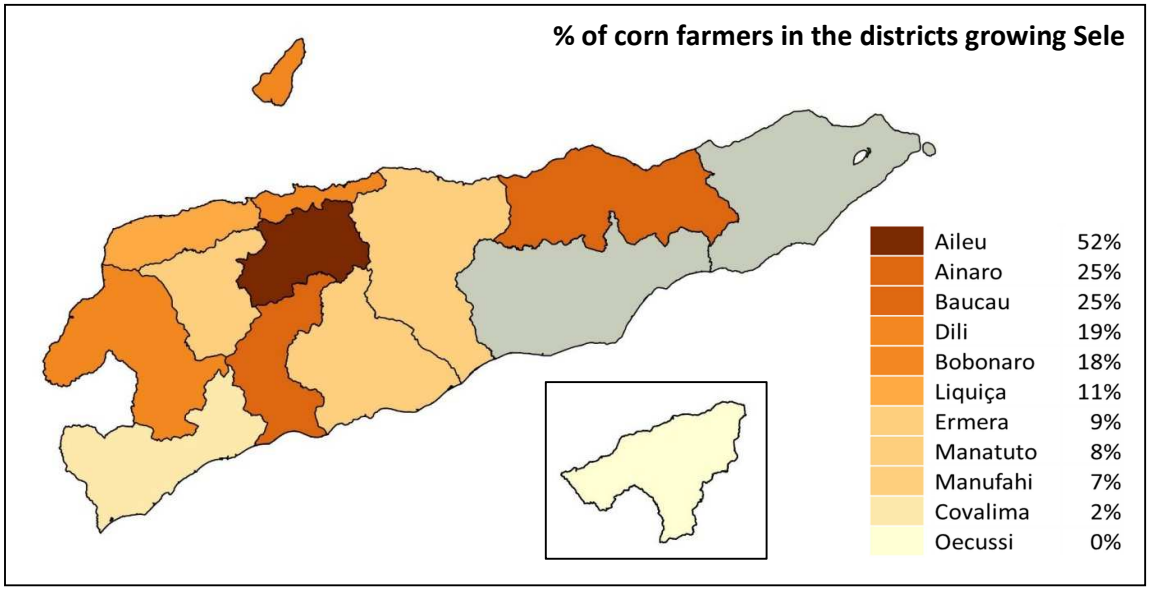


Figure 6. Uptake of Sele, by district

Two-thirds (67%) of the farmers planting Sele either obtained it as a free gift from either an NGO, the Government, a relative, neighbor or friend, or from the Church. Only 12% of the farmers had bought the seed in the market, and none from either a seed bank or a community seed group (see Table 23).

Table 23. Sources of Seed – Sele [13]

Source of seed	Number of times mentioned	% of respondents mentioning source of Sele seed
Given for free by an NGO	63	39%
Given for free by the Government	41	25%
Own seed, saved from a previous harvest	34	21%
Bought in market	19	12%
Given for free by relative / neighbor / friend	3	2%
Given for free by the Church	3	2%
Bought from relative / neighbor / friend	1	1%

[164 sources mentioned by 163 respondents in 11 districts]

A total of 74% of the Sele farmers who expressed an opinion on how the productivity of Sele compared to local varieties said that it was "much better", with another 6% who said it was "better". The productivity was rated the same as that of local varieties by 18% of the respondents.

Table 24 gives the reasons mentioned by the corn farmers growing Sele for selecting the variety. Leaving aside the first reason ("have always grown this" which cannot be the case since the variety was only released in 2007), the main reason was the higher productivity of the variety (48%), followed closely by having received it for free (45%) and its better taste (45%).

Table 24. Reasons for Selecting Sele

Reason	Number of times mentioned	% of respondents providing reasons for selecting the variety
Have always grown this	45	28%
Only choice available	11	7%
Received for free	72	45%
More productive	78	48%
Better taste	73	45%
Preferred colour	12	7%
Easier to store after harvest	8	5%
Better suited to local climate	44	27%
Resistant to wind (short height)	2	1%

[345 reasons mentioned by 161 respondents in 11 districts]

Of a total of 159 Sele farmers in 11 districts, 75% said they would replant the variety in the next season (which in some districts started a few weeks after the survey), and 25% said they would not replant Sele (see Table 25). The most important reason for not replanting Sele was

[13] The data on the source of seed from Viqueque and Lautem has also been discarded for this table, and will be for all following tables that relate to MAF/SoL varieties. The reason for this is that the data from these two districts substantially distorts the results of the data from the other 11 districts.

the unavailability of the seed, or the inability to obtain it, even though the farmers wanted to replant it (95%).

Table 25. Reasons for Not Intending to Replant Sele in the Next Season

Reason	Number of times mentioned	% of respondents providing reasons for not replanting
Farmers – replanting	119 (75%)	
Farmers – not replanting	40 (25%)	
Would like to replant, but don't have / cannot get the seed	38	95%
Production too low	1	3%
Not suitable for the local soil	1	3%
Too difficult to store / post-harvest loss too high	3	8%

[43 reasons mentioned by 40 respondents in 11 districts]

b) Other Corn Varieties than Sele

The most popular corn varieties are *batar bo'ot* and *batar lais*, but there is a decreasing trend in the number of farmers who start growing it. Some other varieties that the corn farmers mentioned they grew were *batar escudo*, *batar kinur bo'ot*, *batar mutin*, *batar mean* and *batar ra nain*.

For these corn varieties, the main source of seed is seed that the farmers have saved from the previous year's harvest. A substantial part of the seed is also bought in the market (18% for *batar lais*, 11% for *batar bo'ot*).

For the non-Sele varieties, the main reasons mentioned by the farmers for selecting the variety was that they had always grown it, or because it was the only choice available to them. For *batar lais* and *batar bo'ot*, suitability to the local climate, productivity and taste are also important considerations. For *batar bo'ot*, ease of storage after the harvest is also a factor.

The overwhelming majority of farmers growing the other corn varieties intend to replant them in the next season (97% for *batar bo'ot*, 99% for *batar lais*), and the main reason mentioned by those who won't replant is because they would like to replant the variety, but don't have the seed, or cannot get it.

2.3.3 Rice

Rice is another key staple crop for farmers in Timor-Leste, even though it is only grown by 38% of the farmers. The three most popular varieties are IR 64, *Mamberamo* and *Dinas*, which are grown by 13% of the rice farmers (See Table 26). The Nakroma variety is currently grown by 11% of the farmers. The majority of those who grow rice (90%) only grow one variety (see Table 27).

Table 26. Rice Varieties Planted

District	Number of farmers planting rice, and % of farmers in the sample		Rice variety planted (number of farmers in district)											
	No.	%	Nakroma	IR-64	IR-54	IR-36	IR-8	IR-5	Mamberamo	Silaun	Nona Portu	Dinas	*Forget the name*	Other
Ainaro	6	6%							1					5
Aileu	22	24%	4	2	1	1	2	1	2	2				16
Baucau	148	63%	35	15	2	7	7		16	42	1		28	17
Bobonaro	72	40%	11	4		2		1	4	1	3	52	3	9
Covalima	33	26%	1	17		4	1	2	8		1			
Dili		0%												
Ermera	40	17%		11		2			4			16	5	2
Liquiça		0%												
Lautem	39	31%	13	5	1	1	10			7	2		2	
Manufahi	18	20%	1	2			14				1			
Manatuto	57	79%	3	12	3	3	5	1			17	2	1	13
Oecussi	146	90%	3	8					36	2	2		81	24
Viqueque	104	64%	104											
Total (13 Dist.)	685	38%	175	76	7	20	39	5	71	54	27	70	120	86
Total (11 Dist.)*	542	36%	58	71	6	19	29	5	71	47	25	70	118	86
			11%	13%	1%	4%	5%	1%	13%	9%	5%	13%	22%	16%

* Without Viqueque and Lautem

Table 27. Number of Rice Varieties Planted by Household

District	Number of farmers planting rice	Number of rice varieties planted (number of farmers in district)			
		One	Two	Three	Four or more
Ainaro	6	6			
Aileu	22	15	6		1
Baucau	148	131	12	5	
Bobonaro	72	57	14		1
Covalima	33	32	1		
Dili					
Ermera	40	40			
Liquiça					
Lautem	39	37	2		
Manufahi	18	18			
Manatuto	57	54	3		
Oecussi	146	136	10		
Viqueque	104	104			
Total (13 Districts)	685	630	48	5	2
Total (11 Districts)*	542	489	46	5	2
		90%	8%	0.9%	0.4%

* Without Viqueque and Lautem

a) Nakroma

In 2011, Nakroma was grown by 11% of the rice farmers. Ignoring Viqueque and Lautem, Nakroma is best established in Baucau (grown by 24% of the rice growers in the district), followed by Aileu (18%) and Bobonaro (11%). In four districts (Ainaro, Dili, Ermera and Liquiça) there were no rice farmers in the sample households which grew Nakroma, and Oecussi and Covalima also have low percentages of rice farmers growing the MAF/Sol variety[14] (see Figure 7).

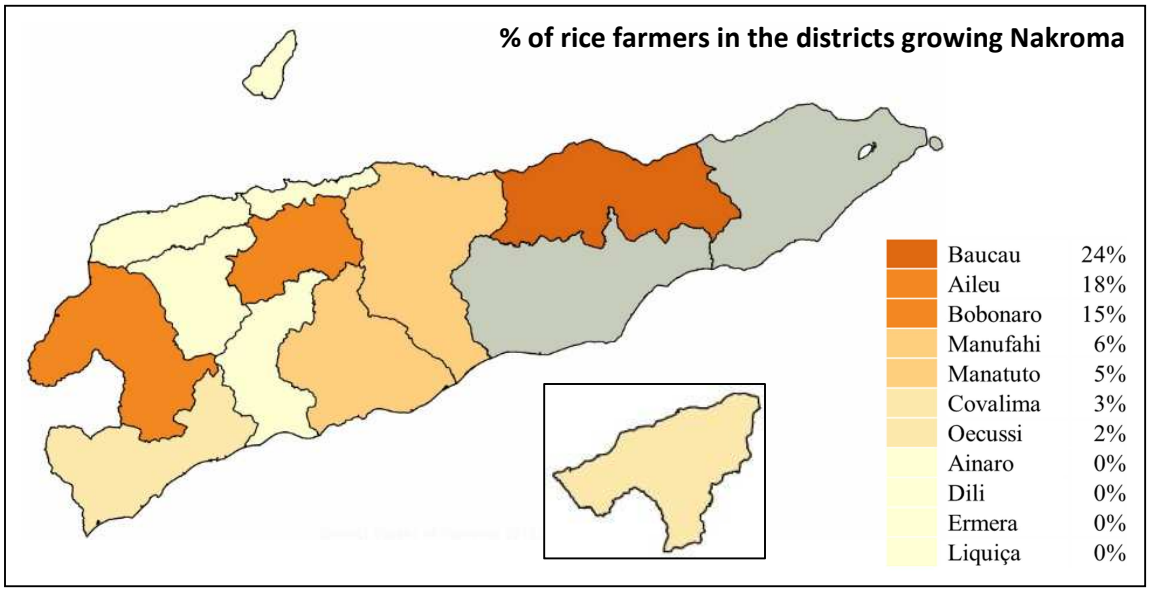


Figure 7. Uptake of Nakroma, by district

Free handouts are an important source of seed for Nakroma rice. A total of 71% of Nakroma farmers said that they had received it for free from either an NGO, the Government, a relative, neighbor or friend, or from the Church (see Table 28). Just over a quarter of the farmers said that they planted seed they had saved from a previous harvest. Purchase of Nakroma seed only accounted for 3.4% of seed provision.

Table 28. Sources of Seed - Nakroma

Source of seed	Number of times mentioned	% of respondents mentioning source of seed
Given for free by an NGO	26	45%
Own seed, saved from a previous harvest	15	26%
Given for free by the Government	13	22%
Given for free by the Church	1	2%
Given for free by relative/neighbor / friend	1	2%
Bought in market	1	2%
Bought from relative / neighbor / friend	1	2%

[58 sources mentioned by 58 respondents in 11 districts]

[14] It is worthwhile to point out that Oecussi is the district where, according to the 2010 Census, 24% of all rice growing households in Timor-Leste live.

The farmers who grow Nakroma are strongly believe that it is more productive than local varieties: 56% say it is much more productive, and 36% say it is more productive.

The reasons mentioned by the rice farmers growing Nakroma for selecting the variety are given in Table 29. Leaving aside the first reason ("have always grown this" which cannot be the case since the variety was only released in 2009), the main reason was its better taste (56%). The high productivity of the variety is also well appreciated (47% of the farmers selected it for that reason), and 42% of the farmers had grown it because they had obtained the seed for free.

Table 29. Reasons for Selecting Nakroma

Reason	Number of times mentioned	% of respondents providing reasons for selecting the variety
Have always grown this	11	19%
Only choice available	4	7%
Received for free	24	42%
More productive	27	47%
Better taste	32	56%
Preferred colour	11	19%
Easier to store after harvest	6	11%
Better suited to local climate	7	12%

[122 reasons mentioned by 57 respondents in 11 districts]

Basically all farmers growing Nakroma intend to replant it in the next season. There were only four farmers who indicated they would not replant, and the reason for not replanting was that they did not have, or could not get the seed.

b) Other Rice Varieties than Nakroma

The other rice varieties than Nakroma currently being cultivated by the rice farmers are mostly varieties that they have been growing for many years. The most popular, as indicated in Table 26, are IR-64, *Mamberamo* and *Dinas* (mostly in Bobonaro and Ermera). Some other rice varieties being mentioned by the farmers were: *Baijama* (Oecussi), *Bubur Musan* (Aileu), *Hare Kinur* (Oecussi), *Hare Marito* (Manatuto), *Hare Mean 330* (Baucau), *Java (*Manatuto) and *Insus* (Baucau).

More than 70% of the seed for the varieties IR-64, *Mamberamo, Dinas, Silaun* and IR-8 comes from the farmers' previous harvests, but 30% of the IR-64 growers had received it for free, and 28% of the *Mamberamo* growers had bought it, either from an acquaintance, or in the market.

For the non-Nakroma varieties, the main reason mentioned by the farmers for selecting the variety was that they had always grown it. For the *Mamberamo* and *Dinas* varieties, suitability to the local climate, and taste are also important considerations.

Basically all rice farmers growing these other varieties intend to replant the variety they have planted before. The two farmers for which the reason for not replanting was noted in the questionnaire, it was because they could not get the seed.

2.3.4 Peanut

Peanut is grown by 21% of the foodcrop growing households. For peanut, there are no varieties that are widespread, but that may in part be due to the fact that more than half of the peanut growers could not remember the name of the variety (see Table 30). Utamua is currently already grown by 16% of the peanut growers.

Table 30. Peanut Varieties Planted

District	Number of farmers planting peanut, and % of farmers in the sample		Peanut variety planted (number of farmers in district)						Number of varieties planted	
	No.	%	Utamua	*Lokal*	*Mean*	*Mutin*	*Forget the name*	Other	One	Two
Ainaro	14	13%		9			5		14	
Aileu	1	1%		1					1	
Baucau	25	11%	13	1			12		24	1
Bobonaro	71	39%	14		1		58	1	68	3
Covalima	10	8%		1			9		10	
Dili		0%								
Ermera	23	10%		1			18	4	23	
Liquiça	40	32%	14	10			12	5	39	1
Lautem	28	22%	21				7		28	
Manufahi	30	33%	7		7	9	5	3	29	1
Manatuto	32	44%	2		10	11		10	31	1
Oecussi	73	45%	1	7	5		52	9	72	1
Viqueque	54	33%	54						54	
Total (13 Dist.)	401	22%	126	30	23	20	178	32	393	8
Total (11 Dist.)*	319	21%	51	30	23	20	171	32	311	8
			16%	9%	7%	6%	54%	10%	97%	3%

* Without Viqueque and Lautem

a) Utamua

The peanut variety Utamua was officially released by the ministry in 2008. The two districts where Utamua is the best established already are Baucau (where it is grown by 52% of the peanut growers) and Liquiça (35%) (see Figure 8). There are also six districts where basically no surveyed farmer yet grows it (Ainaro, Aileu, Covalima, Dili, Ermera and Oecussi).

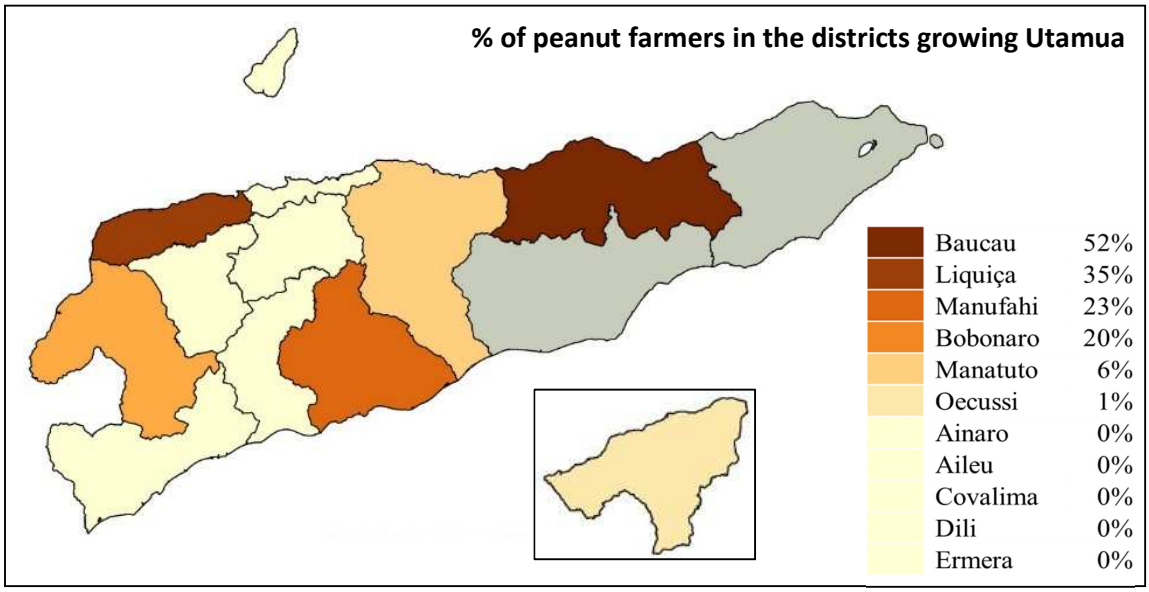


Figure 8. Uptake of Utamua, by district

The main source of the Utamua seed for the surveyed farmers during the 2010/2011 season was free seed (55% of the responding Utamua growers). The main channel for the free seed were the NGOs (39%), with gifts from acquaintances in second place (8%), followed by free seed from the Government (6%) or the Church (2%). In total, 20% of the Utamua growers bought their seed (either in the market, from an acquaintance, or from a community seed group or bank), and 25% had saved seed from an earlier harvest (see Table 31).

Table 31. Sources of Seed - Utamua

Source of seed	Number of times mentioned	% of respondents mentioning source of seed
Own seed, saved from a previous harvest	13	25%
Bought in market	6	12%
Bought from community seed bank / community seed group	1	2%
Bought from relative / neighbor / friend	3	6%
Given for free by relative/neighbor / friend	4	8%
Given for free by the Government	3	6%
Given for free by an NGO	20	39%
Given for free by the Church	1	2%

[51 sources mentioned by 51 respondents in 11 districts]

The majority of the Utamua growers (69%) is of the opinion that the variety is much more productive than local varieties, and another 22% says that it is more productive.

The main reason for selecting the variety, as stated by 42% of the Utamua growers, is its high productivity (see Table 32). Taste (31%) is also a valued characteristic.

Table 32. Reasons for Selecting Utamua

Reason	Number of times mentioned	% of respondents providing reasons for selecting the variety
Have always grown this	19	37%
Only choice available	7	13%
Received for free	10	19%
More productive	22	42%
Better taste	16	31%
Preferred colour	4	8%
Easier to store after harvest	4	8%
Better suited to local climate	6	12%

[88 reasons mentioned by 52 respondents in 11 districts]

Out of 51 Utamua farmers in 11 districts, only two stated they would not replant it in the coming season, and even these two would plant it again if only they did have, or could get the seed.

b) Other Peanut Varieties than Utamua

As more than 50% of the farmers could not remember the name of the peanut variety they had planted, and as many of these most certainly would have been *local*, *mean* and *mutin* varieties – because these are generic descriptions for local, red and white varieties – there is little value in checking for the starting year when the farmers started to grow these; it would be grossly underreported.

Of the 282 peanut farmers who grew another variety than Utamua, 87% used seed saved from a previous harvest. Some 14% of the growers had either bought seed in the market, or from a relative, neighbor or friend. Free handout of peanut seed was not common.

For the peanut growers who did not grow Utamua, the habit of having grown that variety was the main reason for 90% of the respondents, and 27% planted it because they did not have the choice of another variety. Suitability to the local climate (22%), productivity (20%) and taste (15%) are also important considerations.

Of the 282 peanut farmers who had planted another variety than Utamua, 99% stated that they would replant, and those that would not replant would not do so because they did not have the seed.

2.3.5 Cassava

Cassava is the foodcrop that is planted by the highest percentage of farmers (84%). The three most popular varieties are: *manteiga bo'ot* (grown by 55% of the cassava growers), *manteiga kiik* (38%), *nona metan* (31%) (see Table 33). The percentage of cassava growers that planted an Ai-luka variety is less than 5%.

Table 33. Cassava Varieties Planted

District	Number of farmers planting cassava, and % of farmers in the district		Cassava variety planted (number of farmers in district)									
	No.	%	Ai-luka 2	Ai-luka 4	Aifarinha boraisa	Aifarinha manteiga bo'ot	Aifarinha manteiga kiik	Lesu	Nona metan	Silva	*Forget the name*	Other
Ainaro	73	68%	1	1	1	21	35	37	2			6
Aileu	70	78%			4	15	23	11	27	17		11
Baucau	165	71%	13	11	24	103	56	52	28	8	11	1
Bobonaro	162	90%	13	3	23	119	19	24	151	1		4
Covalima	101	80%	4		1	67	13	2	29			
Dili	67	74%			12	26	47	1	2	17		
Ermera	209	89%	3		38	60	61	21	122	8	3	8
Liquiça	121	96%	3		11	63	83	51	18	2		1
Lautem	98	78%	15	11	23	90	58	1				
Manufahi	85	94%	4	1	7	48	62	12	1			
Manatuto	62	86%			3	43	45	2	6		1	1
Oecussi	133	82%	1			122	27	1	2		1	35
Viqueque	136	84%	136									
Total (13 Dist.)	1,482	82%	193	27	147	777	529	215	388	53	16	67
Total (11 Dist.)*	1,248	83%	42 3%	16 1%	124 10%	687 55%	471 38%	214 17%	388 31%	53 4%	16 1%	67 5%

* Without Viqueque and Lautem

Compared to the other foodcrops, cassava growers often cultivate more than one variety of the crop (see Table 33). In the districts Baucau, Bobonaro, Liquiça and Lautem, there are more growers that have planted two cassava varieties than there are single variety growers in those districts.

Table 34. Number of Cassava Varieties Planted

District	Number of farmers planting cassava	Number of varieties planted (number of farmers in district)					
		One	Two	Three	Four	Five	Six
Ainaro	73	44	27	2			
Aileu	70	37	28	5			
Baucau	165	63	74	19	7	1	1
Bobonaro	162	22	91	43	6		
Covalima	101	87	13	1			
Dili	67	36	24	7			
Ermera	209	124	61	18	6		
Liquiça	121	40	58	19	1	3	
Lautem	98	12	74	10	2		
Manufahi	85	40	40	5			
Manatuto	62	26	33	3			
Oecussi	133	83	44	6			
Viqueque	136	136					
Total (13 Districts)	1,482	750	567	138	22	4	1
Total (11 Districts)	1,248	602	493	128	20	4	1
		48%	40%	10%	2%	0.3%	0.1%

* Without Viqueque and Lautem

a) Ai-luka

MAF/SoL released two cassava varieties in 2009: Ai-luka 2 and Ai-luka 4. According to the survey data, Ai-luka 2 would be far more popular than Ai-luka 4: 97% of the Ai-luka farmers grow Ai-luka 2 versus 14% for Ai-luka 4. The fact that the Ai-luka 2 variety has a higher yield advantage over local varieties than Ai-luka 4 (122% vs. 81%) may be the main reason for this. But there is likely an overestimation of Ai-luka 2 growers and an underestimation of Ai-luka 4 growers in the survey data: all cassava growers in Viqueque were reported as Ai-luka 2 growers. If one discards the data of Viqueque and Lautem, then in the 11 districts, there were 43 Ai-luka growers; 42 grew the Ai-luka 2 variety, and 16 grew the Ai-luka 4 variety (15 farmers grew both varieties).

Figure 9 shows that there is no district where 10% of the farmers already grow an Ai-luka variety. The two districts where the Ai-luka varieties are best established – ignoring the misleading data from Viqueque and Lautem – are Baucau (8% of the cassava growers) and Bobonaro (8%).

Table 35 shows that, for both Ai-luka 2 and Ai-luka 4, free distribution of cuttings is the most important source of the planting material, and the most important distribution channel were the NGOs.

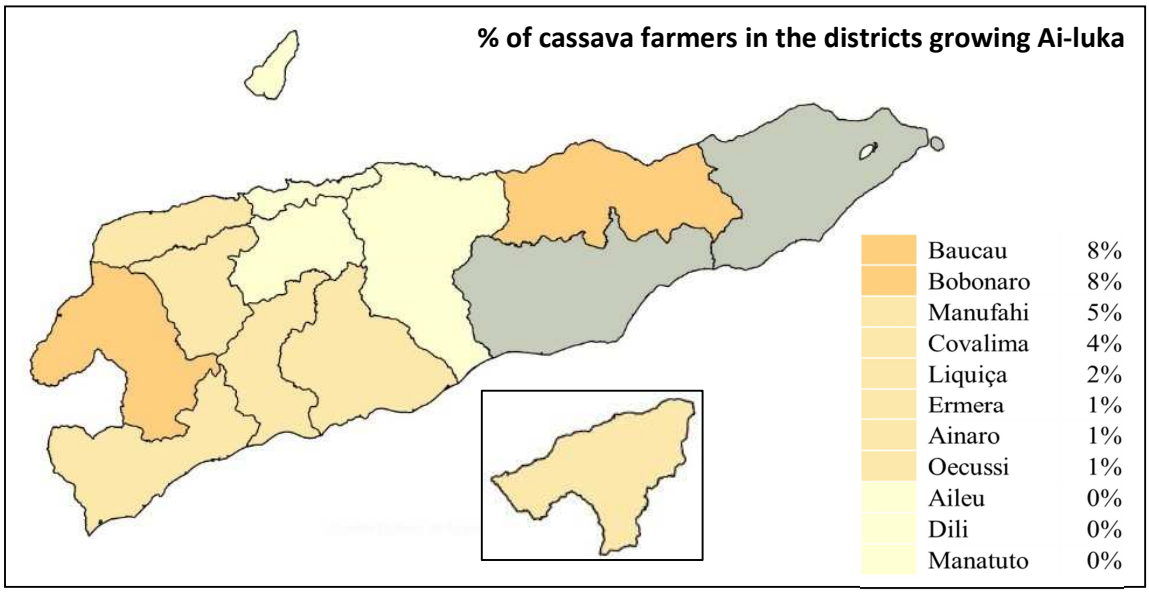


Figure 9. Uptake of Ai-luka, by district

Table 35. Sources of Cuttings – Ai-luka

Source of cuttings	Number of times mentioned		% of respondents mentioning source of cuttings	
	Ai-Luka 2	Ai-Luka 4	Ai-Luka 2	Ai-Luka 4
Own cuttings, saved from a previous harvest	12	1	29%	6%
Bought in market	1		2%	
Bought from community seed bank / community seed group	1		2%	
Bought from relative / neighbor / friend	1	1	2%	6%
Given for free by relative/neighbor / friend	6	2	14%	13%
Given for free by the Government	6	4	14%	25%
Given for free by an NGO	15	8	36%	50%

[58 sources mentioned by 43 respondents in 11 districts]

Both the Ai-luka 2 and the Ai-luka 4 varieties are considered much more productive than local varieties: for both varieties, 60% of the variety growers in the 11 districts considered these much more productive.

The main reasons for selecting the Ai-luka varieties are the good taste, and the high productivity (see Table 36). Close to 30% of the growers also said that they grew the varieties because they had received them for free.

Table 36. Reasons for Selecting Ai-luka

Reason	Number of times mentioned		% of respondents providing reasons for selecting the variety	
	Ai-Luka 2	Ai-Luka 4	Ai-Luka 2	Ai-Luka 4
Have always grown this	15	1	37%	6%
Only choice available	3	1	7%	6%
Received for free	11	5	27%	31%
More productive	17	10	41%	63%
Better taste	18	11	44%	69%
Preferred colour	8	2	20%	13%
Easier to store after harvest	2	1	5%	6%
Better suited to local climate	3	1	7%	6%
Resistant to wind (short height)	1		2%	

[Ai-luka 2: 78 reasons mentioned by 41 respondents in 11 districts; Ai-luka 4: 32 reasons mentioned by 16 respondents in 11 districts]

All the Ai-luka 2 and Ai-luka 4 farmers intend to keep on growing the variety in the coming season.

b) Other Cassava Varieties than Ai-luka

The most popular cassava varieties are: *manteiga bo'ot* (55%), *manteiga kiik* (38%), *nona metan* (31%) and *lesu* (17%) (see Table 33).

The source of cuttings of the traditional cassava varieties are overwhelmingly cuttings saved on the farm from a previous crop (91% for *manteiga bo'ot*, 85% for *manteiga kiik*), with farmers also getting cuttings for free from relatives, neighbours or friends. Few farmers (less than 1%) buy cuttings in the market.

For more than 80% of the farmers, the main reason why they grow the traditional varieties of cassava is that they have always grown them. For many farmers (varying between 14 – 33%, depending on the variety) they did not have the choice of another variety. Suitability to the local climate is also often a reason for growing the variety (varying between 9 – 22%, depending on the variety.

More than 98% of cassava farmers intend to replant, or keep, their traditional varieties, and most of those who say that they will not replant say so because they don't have the planting material anymore, or can't get the cuttings.

2.3.6 Sweet Potato

The two sweet potato varieties – and they may well be groups of varieties rather than single, pure varieties – most popular with East Timorese farmers are *lokal mean* (69%) and *lokal mutin* (67%). The Hohrae varieties 1, 2 and 3 also become noticeable, and seem already well established in Baucau (see Table 37), and there are almost as many sweet potato farmers who grow two varieties as there are that only cultivate one (see Table 38).

Table 37. Sweet Potato Varieties Planted

District	Number of farmers planting sweet potato, and % of farmers in the sample		Sweet potato variety planted (number of farmers in district)								
	No.	%	Hohrae 1	Hohrae 2	Hohrae 3	Lokal mutin	Lokal mean	Lokal Atabae	Mauhato	*Forget the name*	Other
Ainaro	89	82%	3	3	2	36	52	1	12	2	6
Aileu	37	41%	4	1	1	12	17		13		2
Baucau	148	64%	23	13	12	108	102	2		4	
Bobonaro	64	36%	2			56	41	1		1	1
Covalima	25	20%			1	18	12				
Dili	12	13%				7	9				
Ermera	134	57%				108	103	2			
Liquiça	55	44%	6			33	39	2			1
Lautem	73	58%	12	5	2	62	59				
Manufahi	79	88%	6			48	54	1			3
Manatuto	44	61%	2			34	34				1
Oecussi	81	50%				53	67				
Viqueque	107	66%	107								
Total (13 Dist.)	948	53%	165	22	18	575	589	9	25	7	14
Total (11 Dist.)*	768	51%	46	17	16	513	530	9	25	7	14
			6%	2%	2%	67%	69%	1%	3%	1%	2%

* Without Viqueque and Lautem

Table 38. Number of Sweet Potato Varieties Planted

District	Number of farmers planting sweet potato	Number of varieties planted				
		One	Two	Three	Four	Five
Ainaro	89	64	22	3		
Aileu	37	26	10		1	
Baucau	148	50	86	8	2	2
Bobonaro	64	28	34	2		
Covalima	25	19	6			
Dili	12	8	4			
Ermera	134	55	79			
Liquiça	55	30	24	1		
Lautem	73	9	61	3		
Manufahi	79	47	31	1		
Manatuto	44	17	27			
Oecussi	81	42	39			
Viqueque	107	107				
Total (13 Districts)	948	502	423	18	3	2
Total (11 Districts)	768	386	362	15	3	2
		50%	47%	2%	0.4%	0.3%

* Without Viqueque and Lautem

a) Hohrae

The three Hohrae sweet potato varieties were released by MAF in 2009. The survey seems to suggest that, of those three, and leaving aside the data from Viqueque and Lautem, Hohrae 1 is by far the most popular of the three varieties[15]. It is cultivated by 90% of the Hohrae growers, either as the only variety (57%), or as a combination of Hohrae 1 and 2, Hohrae 1 and 3, or all three together (33%).

Figure 10 shows that there are three districts where more than 10% of the sweet potato farmers grow Hohrae: Baucau (18%), Aileu (11%) and Liquiça (11%).

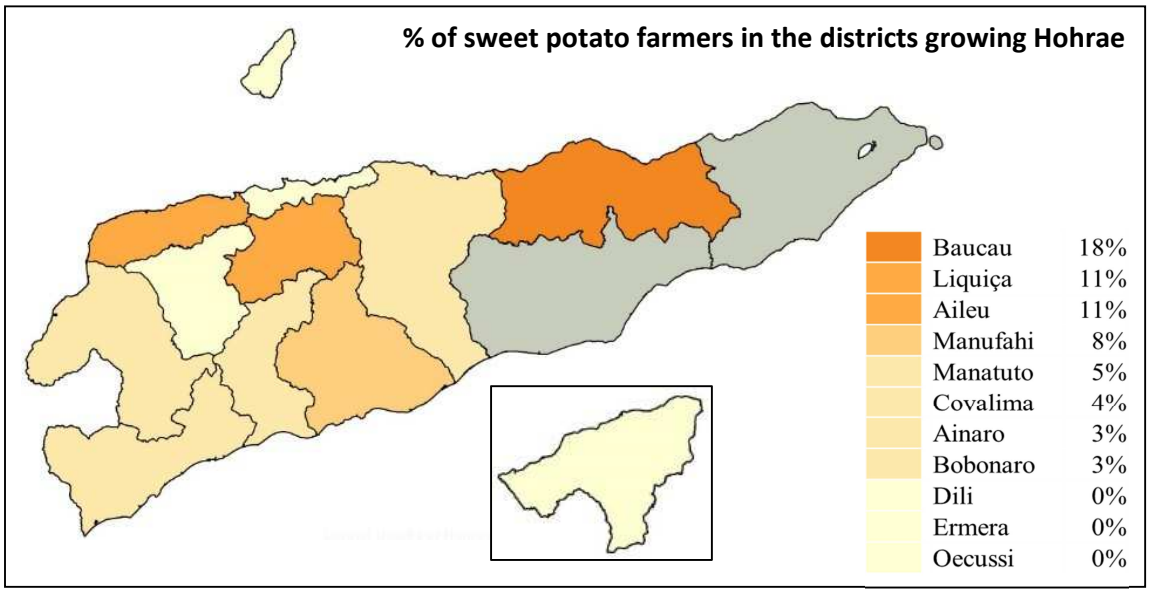


Figure 10. Uptake of Hohrae, by district

Table 38 shows that the most important source of Hohrae cuttings is free distribution by the NGOs, the Government, or gifts from acquaintances. Some farmers also buy cuttings in the market, or from an acquaintance.

Table 39. Sources of Cuttings – Hohrae

Source of cuttings	Number of times mentioned			% of respondents mentioning source of cuttings		
	Hohrae 1	Hohrae 2	Hohrae 3	Hohrae 1	Hohrae 2	Hohrae 3
Own cuttings, saved from a previous harvest	10	2	3	22%	12%	19%
Bought in market	5	1	1	11%	6%	6%
Bought from relative / neighbor / friend	6	1		13%	6%	
Given for free by relative / neighbor / friend	4	2	3	9%	12%	19%
Given for free by the Government	5	2	1	11%	12%	6%
Given for free by an NGO	16	9	8	35%	53%	50%

[79 sources mentioned by 51 respondents in 11 districts]

[15] It may however be that there is also a "rank order" effect. If the respondent did not know whether she or he cultivated Hohrae 1, 2 or 3, it may have been noted down as Hohrae 1.

Nearly all farmers who grow Hohrae consider that it produces much better or better than the local varieties.

The main reasons why Hohrae growers selected the varieties are the taste and productivity of the variety, and for having received it for free (Table 40).

Table 40. Reasons for Selecting Hohrae

Reason	Number of times mentioned			% of respondents providing reasons for selecting the variety		
	Hohrae 1	Hohrae 2	Hohrae 3	Hohrae 1	Hohrae 2	Hohrae 3
Have always grown this	6	2	2	13%	12%	13%
Only choice available	2			4%		
Received for free	19	8	10	41%	47%	63%
More productive	19	8	9	41%	47%	56%
Better taste	19	8	8	41%	47%	50%
Preferred colour	5	4	4	11%	24%	25%
Easier to store after harvest	1		1	2%		6%
Better suited to local climate	7	3	2	15%	18%	13%
Resistant to wind (short height)		1			6%	
Other	1	1	1	2%	6%	6%

[Hohrae 1: 79 reasons mentioned by 46 respondents in 11 districts; Hohrae 2: 35 reasons mentioned by 17 respondents in 11 districts; Hohrae 3: 37 reasons mentioned by 16 respondents in 11 districts]

All Hohrae farmers stated that they intend to replant the varieties.

b) Other Sweet Potato Varieties than Hohrae

The local varieties *mean* and *mutin* are the most popular. They are grown by respectively 69% and 67% of the sweet potato farmers (Table 37).

For both the *mean* and *mutin* varieties, 90% of the cuttings come from the farmers themselves. Some 10% of the farmers have received cuttings for free from an acquaintance.

The main reason for selecting the local sweet potato varieties, apart from having always grown it and it being the only choice available, is the good suitability with the local climate.

Nearly all the sweet potato farmers who grow the traditional varieties intent to continue to grow them, and the few that stated they wouldn't do so the reason was that they did not have, or could not get the cuttings, or that they lacked the money to buy them.

2.4 Food and Seed Storage

2.4.1 Storage of Corn

The farmers growing corn were asked in what ways they stored corn for food and for seed. Table 41 shows that overall 58% of the farmers store corn only in one way, and 42% store it in two ways. Corn for food and corn for seed are stored together by 54 % of the farmers, and 41% store food and seed separately (with an additional 6% of the farmers who store corn only for seed or for food)[16]. Only one corn grower mentioned that he sold all the corn he grew and did not store any.

Table 41. Number of Ways Farmers Store Corn for Food and Seed

District	Number of ways corn is stored by a farmer			Method of storing corn for food and seed (Number of corn farmers in the district)			
	One	Two	Three	Only for food	Only for seed	Food & seed separate	Food & seed together
Ainaro	70	5		39	1	4	31
Aileu	39	10		17	1	10	21
Baucau	50	61		2	1	57	51
Bobonaro	20	151	5	2	2	151	21
Covalima	30	80	2			81	31
Dili	33	21		1	1	20	32
Ermera	110	91		3	1	91	106
Liquiça	109						109
Lautem	45	77		1		75	46
Manufahi	64	26		1		24	65
Manatuto	57	15				13	59
Oecussi	85	76		2	1	74	84
Viqueque	136	3		2		3	134
Total	848	616	7	70	8	603	790
	58%	42%	0.5%	5%	1%	41%	54%
Male-headed HHs	784	568	5	63	7	553	734
Female-headed HHs	64	48	2	7	1	50	56

The most popular ways in which corn is stored are either by keeping the cobs in a sack (practiced by 45% of the corn farmers), or hanging the cobs above the fireplace in the kitchen (45%). Plastic containers used by a single household (20%), metal drums used by a single household (14%) and hanging corn in a tree (11%) is also common practice (Table 42). Shared storage between several households, either in a plastic container (1.4%) or in a metal drum (0.5%) is not very common. Methods of saving corn mentioned under "other" included saving it in a jerrycan, or in metal cans of various sizes (ranging from small cans of condensed milk to 5 l cans, or larger).

[16] It should be noted that in the traditional elevated house (*bouleten*) the corn for food and corn for seed are stored "together but apart"; the seed and the food are both stored in the *bouleten*, but they are put in different sacks or containers. They are not mixed together. Of the 25 corn farmers who stored corn in a *bouleten*, there were 14 farmers who stored both corn for food and corn for seed in this way. They were counted as storing "food and seed together".

Table 42. Number of Farmers saving Corn for Food and/or Seed in Different Ways

District	Manner of storing corn for food and/or seed (Number of farmers storing corn in this manner)										
	In sack	Above the fireplace	Hang in tree	Metal drum (one household)	Metal drum (shared)	Plastic containers (one household)	Plastic containers (shared)	Metal silo (one household)	Metal silo (shared)	Elevated house (Bouleten)	Other
Ainaro	39	16	8	14	1					1	1
Aileu	14	32	3		1	7	2				
Baucau	57	55	25	6	1	3		1			24
Bobonaro	112	62	14	47	2	95	5				
Covalima	86	28	2	13	3	55	6				3
Dili	11	33	8	1		14	3			4	1
Ermera	91	109	2	3		71	3				13
Liquiça	65	37		7							
Lautem	29	32	29	94		14	1				
Manufahi	68	22	14	12							
Manatuto	26	37	21	3							
Oecussi	41	116	3	2		42	1			20	12
Viqueque	25	82	33	2							
Total	664	661	162	204	8	301	21	1	0	25	54
	45%	45%	11%	14%	0.5%	20%	1.4%	0.1%	0%	2%	4%
Male-headed HHs	617	605	148	185	7	279	20	1		23	50
Female-headed HHs	47	56	14	19	1	22	1			2	4

Table 43 shows the reasons mentioned by the corn growers for using a particular storage method. For the traditional methods of storing corn (i.e. in a sack; above the fireplace; hanging in a tree; in a *Bouleten*), the habit of doing it like this is the main reason for continuing doing so. This reason also scores the highest for the long practiced, but less traditional ways of storing corn in metal drums or plastic containers.

It is somewhat surprising that, for the storage in a metal drum by a single household, only 29 of the 189 respondents (15%) mentioned reduced risk of weevil damage as a reason for choosing this method.

The corn farmers were also asked to estimate how much of the corn they stored was lost or unusable. Instead of asking for a percentage, which would have been a bit too abstract for many farmers, the respondents were shown a small pile of 20 corn kernels, and they were asked how big they estimated their loss if the 20 kernels represented the amount they had stored. The results of the estimated storage losses are given in Table 44[17].

[17] It is possible that some respondents understood the question on assessment of corn losses wrong, and instead of picking kernels to represent the amount lost in storage, they picked kernels to represent the amount that was usable after storage. This could be the case for some of the reported losses in the range 60-75%.

Table 43. Reason for Storing Corn with a Particular Method

	No. of respon-dents	# of rea-sons given for this method	Reason (% of respondents giving reasons for this method of corn storage)							
			Custom / have always used this method	Cheap	Easy to check amount of maize left	Easy to move stored grain	Safe / little risk of theft	Little risk of weevil damage or loss	Little risk of damage by rats / rodents	Other
Storage in sack	643	939	73%	13%	24%	14%	5%	10%	5%	0.2%
Storage above the fire place	653	955	77%	9%	18%	11%	2%	23%	6%	0.2%
Hanging in trees	153	257	82%	25%	22%	12%	1%	13%	12%	
Storage in metal drum – This household only	189	257	80%	6%	10%	8%	8%	15%	7%	2%
Storage in metal drum – Shared between households	7	10	57%				14%	43%	29%	
Storage in plastic container(s) – This household only	291	512	77%	1%	11%	8%	8%	44%	28%	0.3%
Storage in plastic container(s) – Shared between households	19	26	53%		5%		11%	47%	21%	
Storage in metal silo – This household only	1	2						100%	100%	
Storage in metal silo – Shared between households	0									
Storage in elevated house (Bouleten)	24	68	92%		67%	33%		67%	25%	
Other	48	63	71%		4%		2%	35%	19%	

Table 44. Estimate of Percentage Storage Loss for Corn

	# report-ing losses	Average loss (%)	Percentage estimate of corn storage losses (Number and percentage of farmers reporting losses for this storage methos)															
			0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%
Storage in sack	656	14.8	34 5%	205 31%	146 22%	80 12%	51 8%	62 9%	16 2%	13 2%	5 0.8%	3 0.5%	29 4%	3 0.5%	4 0.6%	1 0.2%	1 0.2%	3 0.5%
Storage above the fire place	658	13.9	19 3%	183 28%	203 31%	90 14%	56 9%	54 8%	7 1.1%	11 2%	8 1.2%	1 0.2%	21 3%			1 0.2%	1 0.2%	3 0.5%
Hanging in trees	161	17.0	4 2%	20 12%	40 25%	43 27%	20 12%	16 10%	4 2%	1 0.6%	3 2%		9 6%		1 0.6%			
Storage in metal drum – This household only	203	16.1	22 11%	34 17%	37 18%	47 23%	8 4%	28 14%	5 2%	5 2%	5 2%	4 2%	4 2%		3 1.5%			1 0.5%
Storage in metal drum – Shared between households	8	12.5	1 13%	4 50%	1 13%		1 13%						1 13%					
Storage in plastic container(s) – This household only	299	5.2	85 28%	163 55%	34 11%	8 3%	2 0.7%	4 1%	1 0.3%				2 0.7%					
Storage in plastic container(s) – Shared between households	21	6.0	5 24%	10 48%	5 24%			1 5%										
Storage in metal silo – This household only	1	25.0						1 100%										
Storage in elevated house (Bouleten)	25	13.8	1 4%	3 12%	6 24%	11 44%		3 12%	1 4%									
Other	54	18.5	7 13%	15 28%	6 11%	2 4%		15 28%		1 2%			7 13%					1 2%

For the traditional storage methods, the average loss estimations were:

13.8% when the corn was stored in a traditional elevated house (*Bouleten*)
13.9% when corn was hung up in the house above the fireplace
14.8% when stored in a sack
17.0% when hung up in a tree outside the house

The figure reported for the storage loss in metal oil drums kept by individual households (16.1%) seems somewhat exaggerated, especially since the reported average loss for storage in oil drums by several households together is only 12.5%.

Storage in plastic containers gives the lowest average loss estimates: it is reportedly 5.2% for plastic containers kept by individual households, and 6.0% for plastic containers shared between households.

2.4.2 Estimate of Storage Loss for Rice

Using the same method of 20 corn kernels, the farmers who grew rice were also asked what percentage of the rice they had stored had been lost. The method in which the rice was stored was not asked.

Loss estimates were obtained from 691 farmers. Table 45 shows the frequency distribution for the reported percentage storage losses. It seems however odd that a distinct group of 6% of the respondents report losses that are much larger than those reported by the other rice farmers. If we discard the answers for 75% and 80% losses, then the average rice storage loss is 15.0%.

Table 45. Estimate of Percentage Storage Loss for Rice

Percentage estimate of rice storage losses (Number of farmers reporting losses)																
0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%
34	126	219	96	55	56	6	6	5	1	44		3			39	1

2.5 Corn Farmers and Farmer Groups

2.5.1 Decision-making on Corn Variety and Seed Selection

The corn farmers were asked who in the household decided what varieties to plant, and who selected the seed to plant. Table 46 shows that, overall, men make 52% of the choices of what corn variety to plant, and women make 48% of the choices. For seed selection, overall men decide in 55% of the cases, and women in 45%. There are however pronounced differences between the districts. Corn variety selection is more women-determined than men-determined in Manatuto, Bobonaro, Manufahi and especially Oecussi (see Figure 11). Seed selection is more women-determined than men-determined in Covalima and especially Oecussi.

Table 46. Decision-making on Corn Variety to Plant and Seed Selection for the Next Season

Variety selection made by			Seed selection made by		
Men	Women	Unspecified	Men	Women	Unspecified
763	709	15	810	652	21
52%	48%		55%	45%	

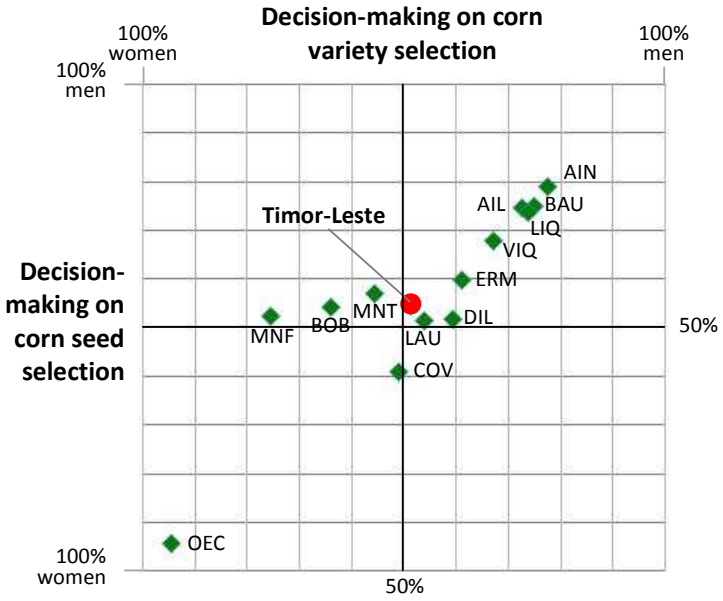


Figure 11. Gender Differentiation in Corn Variety Selection and Corn Seed Selection

Figure **11** and Table 47 shows that corn variety selection and seed selection is not an overwhelmingly male activity. Of the 1,458 corn farmers for which there was data on who selected the variety and the seed, in 50% of the case men selected both of these, but in 42 % of the cases both these choices are made by women in the household.

Table 47. Selection of Corn Variety and Seed Selection

		Choice of corn variety to plant		
		Man	Woman	
Selection of corn seed for next season	Man	723 50%	85 6%	808 55%
	Woman	35 2%	615 42%	650 45%
		758 52%	700 48%	

2.5.2 Number of Corn Seeds planted and Seed Selection Techniques

The respondents were asked how many corn grains they place in each planting hole. Table 48 shows that 66% of the farmers already follow the recommended practice of three grains per hole. In Covalima, and to a lesser extent in Dili – on the main land, not on Atauro –, most of the corn farmers place however four grains in a planting hole. It also seems a bit odd that in Viqueque all corn farmers place three grains in the hole.

Table 48. Number of Corn Seed Grains per Planting Hole

	Number of respondents	Number of corn seed grains per planting hole			
		One	Two	Three	Four
Total	1,487	2	125	988	372
		0.1%	8%	66%	25%
Male respondents	915	1	97	599	218
Female respondents	572	1	28	389	154

The corn farmers were asked what technique(s) they used to select the corn seed. Four techniques were listed, and the farmers could give multiple answers. The four techniques are:

1. Saving seed from the total harvest
2. Selecting specific plant from the standing crop for seeds
3. Selecting cobs after they have been harvested
4. Selecting seeds from a specific section of the cob

As shown in Table 49, 61% of the farmers mentioned that saving seed from the total harvest was the main technique they practiced. One-fifth of the farmers select specific plants from the standing crop before harvest, and nearly half of the farmers select cobs after they are harvested. Selecting the seed from a specific section of the cob (i.e. the middle section) is only practiced by 10% of the corn growers.

Table 49. Corn Seed Selection Techniques

Corn seed selection techniques	Number of respondents	Percentage
Save seeds from the total harvest	908	61%
Select specific plants from the standing crop for seeds	290	20%
Select cobs after they are harvested	728	49%
Select seeds from a specific section of the cob	149	10%

[2,075 answers from 1,478 farmers]

2.5.3 Corn Growers and Farmer Groups

Out of a total of 1,499 corn farmers, 17% belong to a farmer group (see Table 50). There are however substantial differences between the different districts: in Ermera, Liquiça, Oecussi and Viqueque less than 10% of the corn farmers belong to a group, whereas is six districts (Ainaro, Aileu, Baucau, Bobonaro, Covalima and Manatuto) more than a quarter of the corn farmers belong to a group, even reaching more than 50% in Covalima. On average, 36% of the farmer groups also produce seed for its members, but again with substantial differences between districts.

Table 50. Corn Growers who are Members of Farmer Groups

	Number of respondents	Farmer group members	% of respondents	Group growing seed	% of farmer groups
Total	1,499	259	17%	93	36%
Male respondents	921	178	19%	70	39%
Female respondents	578	81	14%	23	28%

2.5.4 Seed sold by Farmer Groups, Local Seed Traders and Seed Fairs

In the questionnaire, the corn farmers who mentioned that they were members of farmer groups were asked if they also had sold seed of corn, rice or peanut. Only nine of the 259 farmers belonging to a farmer group had sold corn seed, and seven farmers had sold rice seed

Seed selling by farmer groups is not a frequent occurrence yet. Table 51 shows that overall 6% of the respondents knew of the existence of a farmer group in the suco selling seed. Knowledge of seed traders in local markets was more widespread: on average 28% of the farmers knew that there was a trader in the local market who sold or bought seed[18]. The knowledge of men or women of farmer groups selling seed, or of local market seed traders, is the same.

Table 51. Seed Selling Farmer Groups and Local Seed Traders

District	Know farmer group in Suco selling seed	% of respondents	Know that there is a seed trader in the local market	% of respondents
Ainaro	7	9%	38	49%
Aileu	10	20%	21	41%
Baucau	4	3%	30	24%
Bobonaro	12	7%	109	62%
Covalima	14	13%	12	11%
Dili		0%	14	23%
Ermera	2	1%	15	7%
Liquiça	6	6%	43	40%
Lautem	3	2%	23	19%
Manufahi	10	11%	15	17%
Manatuto	5	7%	25	35%
Oecussi	6	4%	42	26%
Viqueque	12	8%	32	22%
Total	91	6%	419	28%
Male respondents	58	6%	254	27%
Female respondents	33	6%	165	28%

The corn farmers were asked if they were familiar with the name “Seed fair”. Only 7% of the farmers were familiar with the term, with male respondents being twice as familiar with it than the female respondents (Table 52). Seed fairs are reasonably well known in Ainaro

[18] In most cases this will probably be a trader who sells grain that can either be used for food or for seed; there are hardly any, if any at all, specific seed traders operating in the local markets.

(36%) and Aileu (22%), but not at all in Oecussi (0%), and very little in Bobonaro, Dili, Liquiça and Viqueque (2-3%).

In terms of locations where seed fairs are held, 55% are familiar with seed fairs held in the sucos. Seed fairs are mostly associated with MAF (67%), followed by NGOs (36%).

Table 52. Seed Fairs

	Know of "Seed Fairs"	% of respondents	Locations					Seed Fair organizers				
			Suco	Sub-District	District	Regional	Dili	MAF	Church	NGO	Private comp	Other
Total	113	7%	59 55%	16 15%	19 18%	6 6%	17 16%	72 67%	15 14%	39 36%	3 3%	2 2%
Male respondents	90	10%	48	13	15	5	15	58	15	34	3	2
Female respondents	23	4%	11	3	4	4	4	14	4	1		

2.6 Familiarity with Seeds of Life

2.6.1 Familiarity of Respondents with the Seeds of Life Program

The respondents were asked if they had already heard of the Seeds of Life program. Overall 197 (11%) of the respondents had heard about SoL before, ranging from a low 2% in Bobonaro and Viqueque to 33% in Ainaro. The male respondents generally had more often heard of SoL than the female respondents (13% for men vs 7% for women), but in some districts it was the opposite.

Of the 168 respondents who remembered when they had heard about the Seeds of Life program, one third had heard about the program in the last six months, and another third within the last year.

Table 53 shows that the most important channel through which the respondents had learned about SoL were MAF staff and/or extension workers (33%), followed by SoL staff (22%), NGOs/organizations (19%), media or relatives (17%) and neighbours (15%). There were no major differences between channels for male and female respondents, except where the information came through SoL staff; male respondents were two times more likely to have learned about the program through SoL staff than female respondents. The majority of the respondents (77%) listed only one channel for learning about SoL, 16% listed two channels, 6% three channels and 1% four channels.

Table 53. Channel of Familiarity with the Seeds of Life Program

	MAF staff / Extension workers	SoL staff	NGOs / Organisations	Media (Newspaper, radio, TV)	Relative	Neighbour	Church	Other	Total
Male	50	37	30	25	27	23	3	4	150
	33%	25%	20%	17%	18%	15%	2%	3%	
Female	15	6	7	8	7	6	2	3	47
	32%	13%	15%	17%	15%	13%	4%	6%	
Total	65	43	37	33	34	29	5	7	197
	33%	22%	19%	17%	17%	15%	3%	4%	

Of the 79 respondents who stated that they, or a member of their household, were involved in SoL program activities, 20% were involved as On-Farm Demonstration Trials (OFDT) farmers, 16% as contract seed growers, and 78% as members of a seed production group. The latter does, however, include respondents who considered themselves involved in SoL program activities in districts where SoL doesn't currently operate yet.

2.6.2 Knowledge of other Farmers growing MAF/SoL varieties

After having enquired about the name recognition of SoL, the respondents were asked if they knew anyone who already grows, or has grown, a MAF/SoL variety of a crop. The Field Interviewers carried copies of the crop information leaflets so that the respondents did not only hear the name of the crop and the variety, but also saw some pictures of it.

Originally it was thought that some 798 farmers (44%) knew someone who is growing, or has grown in the past, a MAF/SoL variety. However, when calculating the percentages per district, the data obtained from Lautem and Viqueque again appeared to be rather suspicious (with variety recognition of more than 90% in Lautem and 100% in Viqueque). It was therefore decided to calculate this only for the other 11 districts. Table 54 shows that in the 11 districts overall 13% of the farmers have heard of SoL, and 34% know someone who grows, or has grown, one or more MAF/SoL varieties. Men are better acquainted with SoL, and know more MAF/SoL variety growers, than women.

Table 54. No. of farmers recognizing the name SoL and knowing farmers growing MAF/SoL varieties

	Know SoL		Know MAF/SoL variety grower	
	Number	% of respondents	Number	% of respondents
Total (13 Districts)	197	11%	798	44%
Total (11 Districts)*	189	13%	518	34%
Male respondents (11 Districts)*	144	15%	369	38%
Female respondents (11 Districts)*	45	9%	149	28%

* Without Viqueque and Lautem

More detailed analysis how the farmers who are familiar with the name "SoL" relate to the farmers who know someone who grows, or has grown, a MAF/SoL variety shows that the two do not necessarily go together (see Table 55). Of all the farmers who know SoL, 41% do not know another farmer who grows the variety[19].

Table 55. Knowledge of "Seeds of Life" vs knowing MAF/SoL variety growers

		Knows "Seeds of Life"		
		Yes	No	
Knows someone growing MAF/SoL varieties	Yes	111 7%	407 27%	518 34%
	No	78 5%	915 61%	993 66%
		189 13%	1,322 87%	

[1,511 respondents in 11 districts]

Table 56 shows that overall 34% of the farmers knew someone who is growing, or has grown in the past, a MAF/SoL variety. For the different crop varieties, the percentages are: 22% for Sele, 20% for Nakroma, 15% for Utamua, 10% for Ai-luka an 10% for Hohrae. The acquaintance is for all varieties, except Ai-luka 4 and Hohrae 2 and 3, primarily a relative.

[19] The actual percentage is most likely less than this. Of the 485 farmers who cultivated MAF/SoL varieties, 45 respondents (9%) said they did not know someone who grew a MAF/SoL variety. There was however some scope of confusion in the formulation of the question since it was not specified whether the respondent could include him- or herself, or not.

Table 56. Familiarity of Respondents with MAF/SoL Varieties

Crop variety		No. and % of farmers who know someone growing the crop *	Relationship to known MAF/SoL variety grower (No. and % of known MAF/SoLvariety growers)			
			Relative	Neighbour	Friend	Other
Corn	Sele	326	226	144	107	23
		22%	69%	44%	33%	7%
Rice	Nakroma	298	181	144	163	37
		20%	61%	48%	55%	12%
Peanut	Utamua	231	158	135	129	23
		15%	68%	58%	56%	10%
Cassava	Ai-luka 2	151	86	78	75	10
		10%	57%	52%	50%	7%
	Ai-luka 4	119	60	59	65	8
		8%	50%	50%	55%	7%
	Ai-Luka 2 & 4 combined	156				
		10%				
Sweet potato	Hohrae 1	139	83	75	74	6
		9%	60%	54%	53%	4%
	Hohrae 2	103	54	49	58	4
		7%	52%	48%	56%	4%
	Hohrae 3	94	49	40	53	4
		6%	52%	43%	56%	4%
	Hohrae 1, 2 & 3 combined	147				
		10%				
All five crops combined		518				
		34%				

* Based on data from 1,510 respondents in 11 districts

2.7 Food Security

2.7.1 Food Self-Sufficiency

The farmers were asked during what months of the previous 12 months they were able to consume food from the crops they had grown. This gave percentages that were in the order of 33-71% for corn, 39-72% for rice, 26-54% for peanut, 51-77% for cassava, and 39-65% for sweet potato. However, when looking at the data for each of these crops on the number of months each household could consume self-cultivated crops, it became clear that the number of households that reported to be able to consume such crops during 12 months was highy inflated, and thus unreliable (see Box 3).

Table 57 shows the adjusted data for each of the five crops. For corn, October 2010 was reportedly the month with the lowest overall availability of self-grown corn for consumption (25%). The prolonged wet season of 2010-'11 may be partly the reason for this. The months with the highest percentages for self-sufficiency in corn were April and May (67%), which is after the harvest (see Figure 13).

Table 57. Number and Percentage of Crop Growers Able to Consume Self-Grown Crops [Adjusted figures]

Crop	Calculated # of HHs with harvest	Month in which food from self-grown crops was available											
		Oct 2010	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep 2011
Corn	1,340	339 25%	379 28%	410 31%	505 38%	584 44%	785 59%	904 67%	896 67%	801 60%	704 53%	587 44%	499 37%
Rice	547	138 25%	134 24%	143 26%	131 24%	136 25%	146 27%	197 36%	290 53%	354 65%	343 63%	319 58%	233 43%
Peanut	394	79 20%	102 26%	98 25%	85 22%	97 25%	143 36%	169 43%	197 50%	189 48%	152 39%	126 32%	120 30%
Cassava	1,002	285 28%	326 33%	370 37%	331 33%	349 35%	379 38%	433 43%	476 48%	573 57%	584 58%	655 65%	582 58%
Sweet potato	747	155 21%	214 29%	235 31%	209 28%	204 27%	253 34%	267 36%	330 44%	405 54%	391 52%	369 49%	304 41%

Note: The number of farmers mentioned in the month columns are "corrected" numbers of farmers. The overestimated number of farmers reportedly consuming the crop in every one of the 12 months have been omitted, and instead the number of farmers consuming during 11 months have been counted for each of the months. The total number of farmers mentioned in the second column has been adjusted in the same manner.

Box 3: Checking the plausibility of data on consumption of self-grown crops, and addressing the problem

When plotting the data on consumption of self-grown crops by the number of months the household could consume the crop, the graphs showed abnormal results for the value of "12 months" (see for example Figure 12 for the consumption of rice). Looking at the data for 11 to 0 months, one would expect that the data for 12 months would follow the general pattern, and be fairly similar, or smaller, to the data for 11 months.

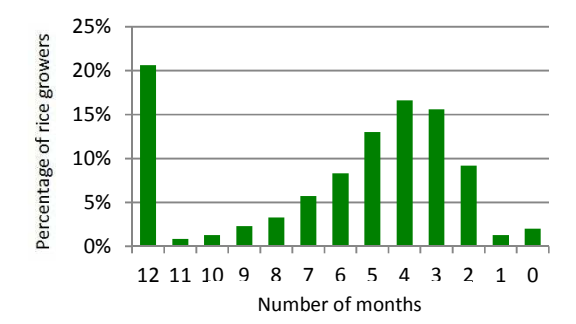


Figure 12. Number of Months Rice Growers consume Self-Grown Rice

The first approach to separate reliable from unreliable data for the households that reported to be able to consume self-grown crops for the 12 months of the year was to triangulate the data from each household on crop consumption with:

a) the data on the size of the plots on which the crop was grown;
b) the reported data on the amount harvested;
c) the number of people in he household.

This proved difficult because the reliability of the data on plot sizes and amounts harvested is itself rather dubious. It was therefore difficult, based on this triangulation, to decide whether the consumption data of one household was more plausible than that of another household.

Another approach was used to obtain a more plausible estimate the number of households that could consume self-grown crops during a whole year. Based on the above figure, a realistic estimate of the number of households capable of consuming a self-grown crop for the 12 months of the year is to assume that it is the same as the number of households that reported to be capable of consuming self-grown crops during 11 months of the year. The figure for "11 months" was therefore taken as the figure for "12 months".

For the other households, i.e. those that reported to be able to consume self-grown crops between 0-11 months, the data as reported by the households was considered sufficiently reliable. No corrections were made to this data.

For rice, the data in Table 57 and Figure 13 show that during the six months from October to March, around a quarter of the respondents could consume self-grown rice. It then increased to 65% in June before declining again in September.

Peanut follows a similar pattern. In the period October to February, about a fifth to a quarter of the households growing it were able to consume it, and that increased to half of the growers in May, before gradually declining to a third of the households in September.

Cassava showed an increasing trend for nearly the whole year, from 28& to 65%, with a small decline in September 2011. The pattern for sweet potato was fairly similar, except that the decreasing trend started two months earlier.

The number of months during which the farmers can consume self-grown crops is shown in Table 58 and in Figure 14.

Table 58. Number of Months of Self-Sufficiency with Self-Grown Crops
[Adjusted figures]

Crop	Corrected # of farmers	Number of months in which food from self-grown crops was available												
		12	11	10	9	8	7	6	5	4	3	2	1	0
Corn	1,350	19 1.4%	19 1.4%	40 3%	63 5%	95 7%	201 15%	208 15%	202 15%	219 16%	158 12%	109 8%	7 0.5%	10 0.7%
Rice	561	6 1.1%	6 1.1%	9 2%	16 3%	23 4%	40 7%	58 10%	91 16%	116 21%	109 19%	64 11%	9 2%	14 2%
Peanut	412	1 0.2%	1 0.2%		2 0.5%	7 2%	33 8%	39 9%	56 14%	62 15%	97 24%	80 19%	16 4%	18 4%
Cassava	1,041	53 5%	53 5%	17 2%	32 3%	44 4%	88 8%	121 12%	113 11%	162 16%	142 14%	164 16%	13 1.2%	39 4%
Sweet potato	769	13 2%	13 2%	5 0.7%	12 2%	24 3%	56 7%	89 12%	93 12%	137 18%	160 21%	132 17%	13 2%	22 3%

Note: The number of farmers mentioned in the second column is a "corrected" numbers of farmers. The overestimated number of farmers reportedly consuming the crop in each of the 12 months have been omitted, and instead the number of farmers consuming the crop during 11 months has been taken as the number of crop consumers for 12 months.

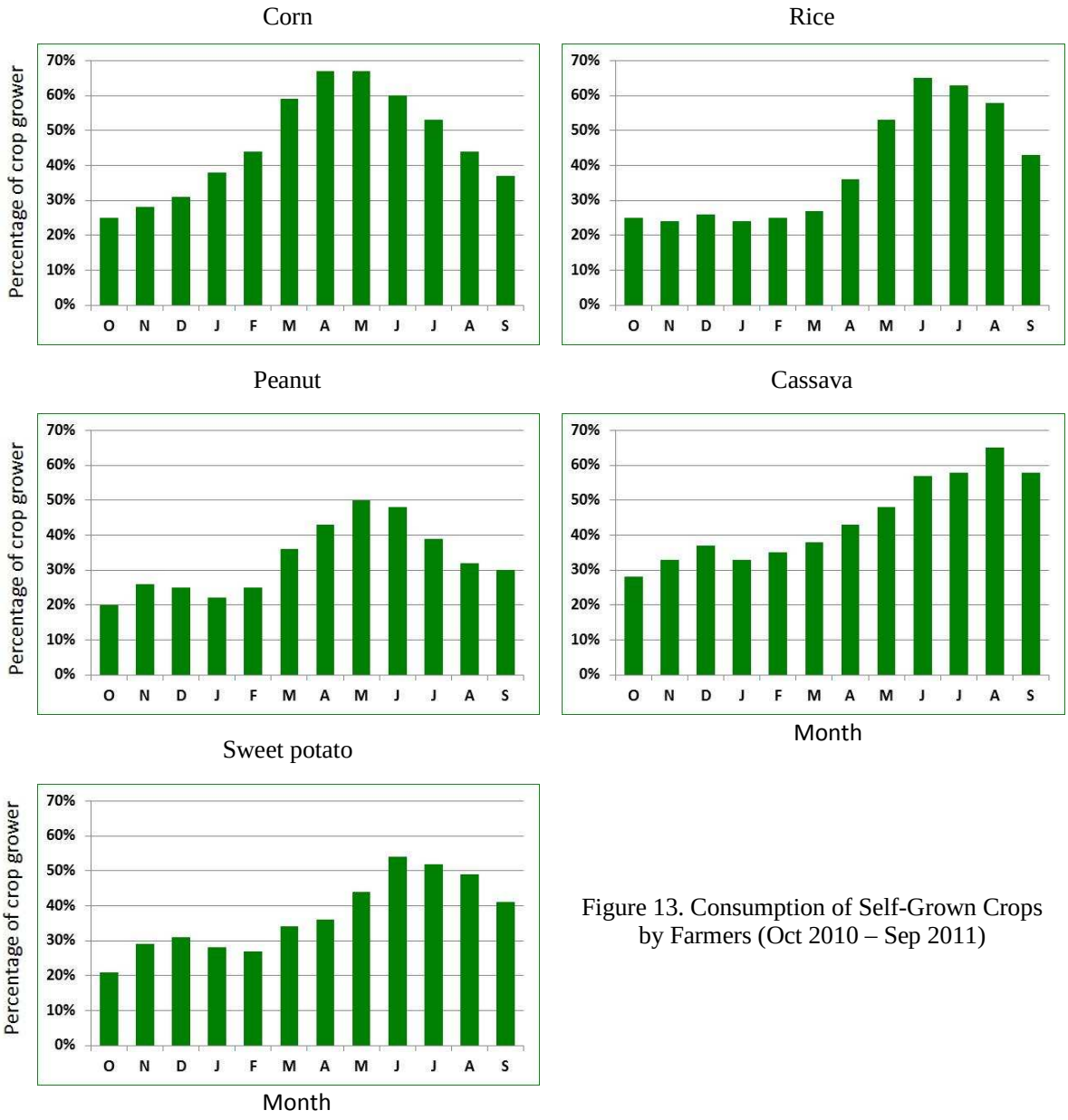


Figure 13. Consumption of Self-Grown Crops by Farmers (Oct 2010 – Sep 2011)

With increases in production of the various crops and improved ways to store harvests, one would expect that higher percentages of farmers will be able to consume self-grown foods in the different months.

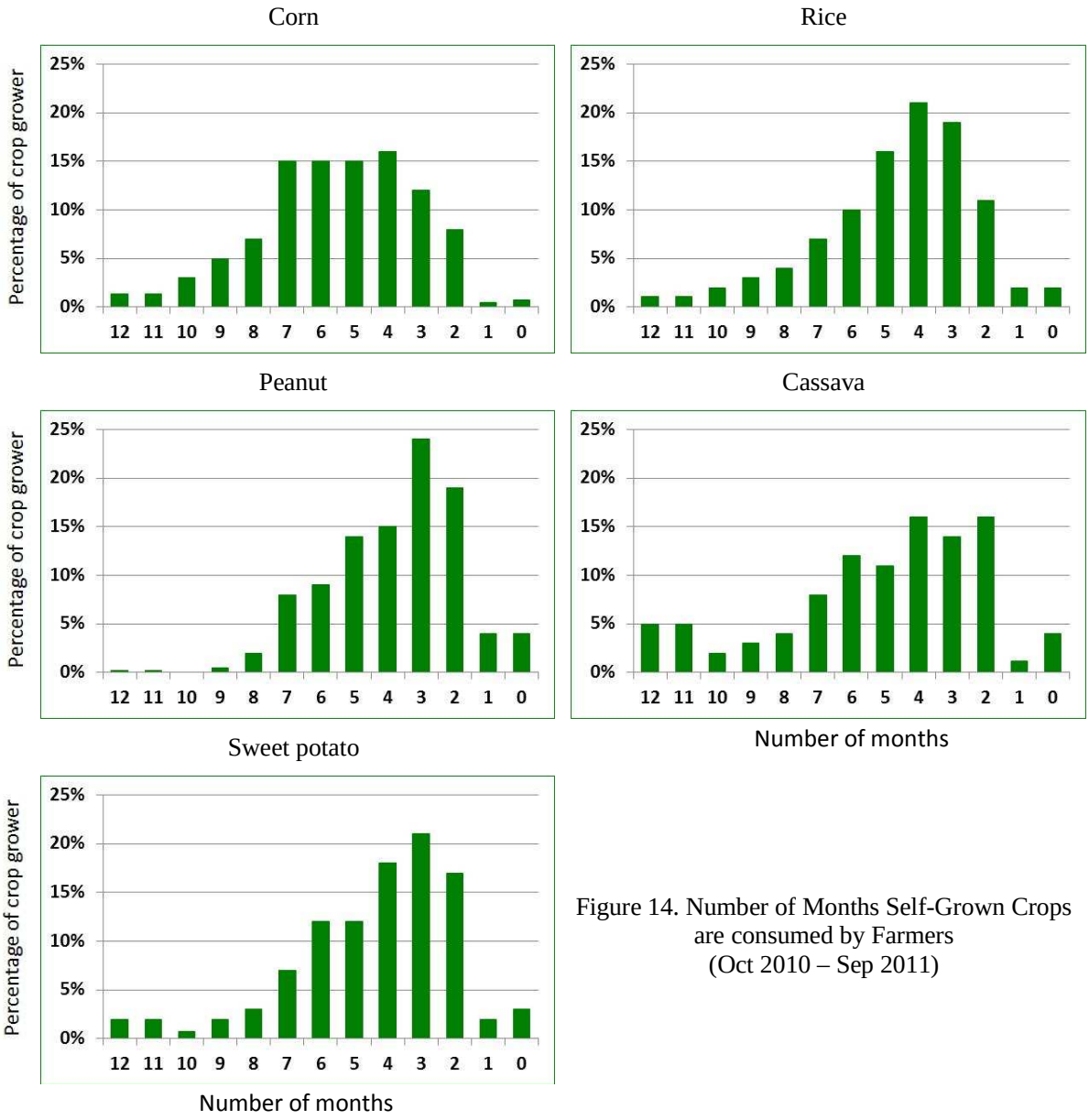


Figure 14. Number of Months Self-Grown Crops are consumed by Farmers (Oct 2010 – Sep 2011)

Figure 14 shows that, for most corn growing households, self-sufficiency in corn ranged between three to seven months. For rice growers, a little over 50% of the farmers could consume self-grown rice between three to five months[20].

With increases in production of the various crops and improved ways to store harvests, one would expect that the patterns of the graphs above will shift to the left, i.e. farmers can consume self-grown food for longer periods.

[20] It is however important to note that basically all farmers (99.6%), including those growing rice, buy rice as well. See Section 2.7.4 of this report.

2.7.2 Household Food Insecurity [21]

The questionnaire included the Household Food Insecurity Access Scale (HFIAS) tool developed by the Food and Nutrition Technical Assistance (FANTA) project to appraise access to, and availability of, food in the visited households[22].

The HFIAS tool consists of nine questions that probe whether a household experienced some forms of food insecurity during the previous month, and how severe such food insecurity experiences were, if they occurred. The HFIAS occurrence questions are:

Q1. In the past four weeks, did you worry that your household would not have enough food?

Q2. In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?

Q3. In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?

Q4. In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?

Q5. In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?

Q6. In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food?

Q7. In the past four weeks, was there ever no food to eat of any kind in your house because of lack of resources to get food?

Q8. In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?

Q9. In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?

If the answer to any of the above questions is "Yes", a follow-up frequency-of-occurrence question is asked.

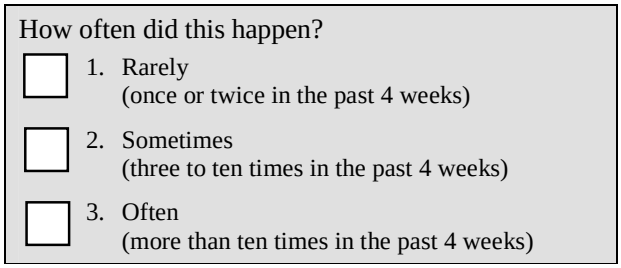


Figure 15. Frequency-of-Occurrence Question of the HFIAS Tool

[21] A more elaborate discussion of household food insecurity issues based on the HFIAS data collected in the baseline survey is given in Volume 3, Annex 6.

[22] This section on household food insecurity, the HFIAS tool and the derived indicators draws heavily on Coates, Jennifer et. al. (2007), Ballard, Terri et. al. (2011) and Deitchler, Megan et. al. (2011).

Using these nine occurrence and frequency-of-occurrence questions, or a subset of them, there are five types of indicators that can be calculated to help understand the characteristics of, and changes in, household food insecurity of the surveyed households:

a) Household food insecurity access related conditions
b) Household food insecurity access related domains
c) Household food insecurity access scale score
d) Household food insecurity access prevalence
e) Household hunger scale

In this Main Report, only the HFIAS Score and the Household Hunger Scale are discussed.

Household Food Insecurity Access Scale Score

Using the data from the nine questions, a HFIAS score can be calculated for every household, which indicate how food insecure the household was. The score is the sum of the codes for each frequency-of-occurrence question, i.e. 1, 2 or 3 if the answer to the question was "Yes", and 0 if the answer was "No". With nine questions, and possible scores ranging between 0 and 3, a household's HFIAS score will fall within the range 0 to 27. A low score indicates that access to, and availability of food in the concerned household was fairly secure; a high score indicates a higher level of food insecurity for that household. The frequency distribution of the HFIAS scores of all 1,799 households is given in Figure 16.

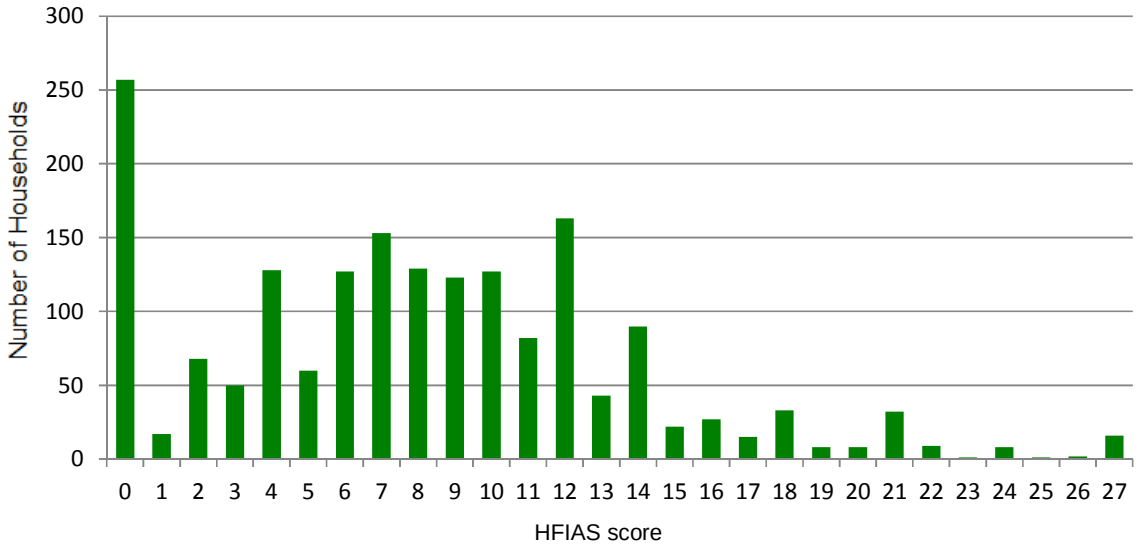


Figure 16. Frequency Distribution of the Household HFIAS Scores

There were 257 households that did not experience any food insecurity during the 30 days prior to the visit of the baseline survey enumerators (score 0), and 16 households that were extremely food insecure (with the maximum HFIAS score of 27). The frequency distribution in Figure 16 also suggests that there may be both some over-reporting and under-reporting of food insecurity occurences, resulting in an unregular frequency distribution pattern with higher-than-expected frequencies for some scores (i.e. 4, 12, 14, 21 and 27), and lower-than-expected frequencies for others (i.e. 3, 5, and 8).

Based on these household HFIAS scores, average HFIAS scores can be calculated for the districts (see Table 59). The three most food insecure districts in the period September-October 2011 were Aileu, Dili and Oecussi; the three least food insecure were Bobonaro, Liquiça and Manufahi. The comparison of HFIAS scores between male and female respondents show that in 10 out of the 13 districts, women considered their households to be more food insecure than men. This can point to women having a dimmer view of, and being more concerned than men on the food security in their households. But it can of course also be that it is not a difference in perception of households facing similar conditions, but that the female respondents lived in households that were genuinely more food insecure.

Table 59. Household Food Insecurity Access Scale Score

Districts	HFIAS Scores		
	Male respondents	Female respondents	Total
Ainaro	8.5	9.9	8.8
Aileu	11.8	15.2	12.5
Baucau	9.3	10.7	9.7
Bobonaro	2.5	2.1	2.3
Covalima	8.7	8.1	8.4
Dili	12.9	11.9	12.5
Ermera	8.2	10.3	8.9
Liquiça	4.2	5.3	4.5
Lautem	7.9	8.1	8.0
Manufahi	4.2	6.6	4.9
Manatuto	5.4	7.5	6.0
Oecussi	10.9	9.9	10.2
Viqueque	8.6	8.8	8.7
Total	7.7	8.7	8.1

Household Hunger Scale

Based on the results of several studies conducted by the FANTA project to assess the cross-cultural validity of the HFIAS tool, it was found that the questions 7, 8 and 9 of the HFIAS tool gave a more reliable measure of food deprivation in the visited households than the full set of nine questions. Another finding was that the use of three frequency categories ("no or never" with score 0, "rarely or sometimes" with score 1, and "often" with score 2) produced more robust results than the use of the original four frequency categories. This calculation gives a household hunger scale (HHS) rating for each household.

Using the data from the questions 7, 8 and 9 of the HFIAS tool only, the three districts with the highest levels of hunger in the households were Dili, Ainaro and Aileu (see Table 60). The three districts with the lowest levels of hunger in households were Viqueque, Manatuto and Manufahi. The female respondents assessed their households to experience higher levels of hunger than the male respondents.

Table 60. Household Hunger Scale

Districts	Level of hunger in the household			Average HHS of the district
	Little or no	Moderate	Severe	
Ainaro	68%	17%	16%	1.31
Aileu	69%	20%	11%	1.24
Baucau	88%	11%	0%	0.52
Bobonaro	97%	3%	0%	0.18
Covalima	96%	4%	0%	0.56
Dili	67%	14%	19%	1.72
Ermera	84%	16%	0%	0.62
Liquiça	98%	1%	1%	0.26
Lautem	98%	2%	0%	0.21
Manufahi	99%	1%	0%	0.13
Manatuto	99%	1%	0%	0.11
Oecussi	80%	20%	0%	0.82
Viqueque	100%	0%	0%	0.02
Total	88%	9%	3%	0.55
Male respondents	90%	7%	3%	0.52
Female respondents	86%	12%	2%	0.61

For the total survey, this gives 88% of households with little or no level of hunger, 9% with a moderate level of hunger, and 3% with a severe level of hunger. It is important to keep in mind that the survey was conducted in October, with the HFIAS questions referring largely to the period from early September to mid-October. This is not the peak of the hungry season, which explains why the percentage of households experiencing hunger is relatively small.

Using the HHS ratings of the individual households, an average HHS can be calculated for each of the 100 sucos. Grouping the sucos into six categories based on their average HHS, the household hunger situation in Timor-Leste can be presented as in Figure 17.

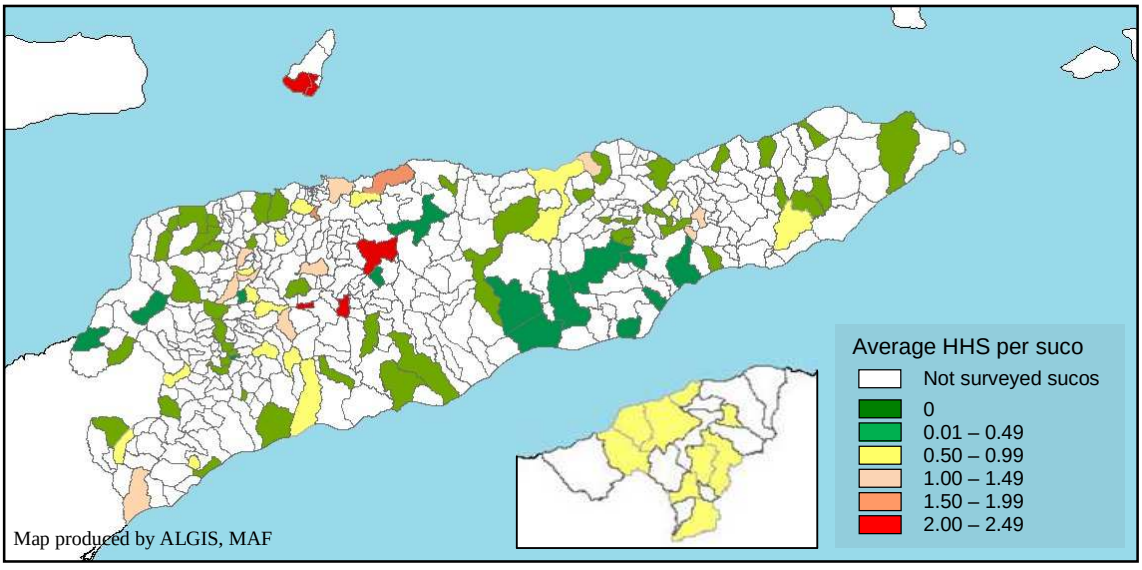


Figure 17. Household Hunger Conditions of Sucos (September 2011)

2.7.3 Consumption of Wild Food

The respondents were asked in which months of the previous year they consumed wild foods (such as wild yam (*kumbili*), elephant foot's yam (*maek*), wild bean (*koto fuik*), arrowroot (*kontas*), etc)[23]. The question was originally phrased as "*eating wild foods because of lack of other foods*", but the latter part of that sentence was subsequently dropped as respondents explained that they consumed wild foods even if they had other sources of food. Table 61 shows the number of households in each district who consumed wild foods in the period October 2010 to September 2011, and how many of these consumed such foods in each month.

In 10 of the 13 districts, more than 85% of the households consume wild foods during part of the year. Oecussi, with 36%, is the district with the lowest percentage of respondents eating wild foods. It is also noticeable that, even though a high percentage of the households may consume wild foods, in most months less than a quarter of those respondents eat such foods (the exceptions are the districts Viqueque and Lautem, where wild food consumption is substantial throughout the year).

[23] The inclusion of arrowroot (*kontas*) in the list of example wild foods is a mistake, as it is not a plant growing in the wild but one that has been purposely planted by the farmer.

Table 61. Consumption of Wild Food [Percentage of respondents who consume wild food]

Districts	# of HHs consuming wild foods, and % of respondents in the district	Month in which wild food was consumed											
		Oct '10	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep '11
Ainaro	106	20	16	17	16	16	19	30	81	84	63	57	58
	98%	19%	15%	16%	15%	15%	18%	28%	76%	79%	59%	54%	55%
Aileu	89	7	7	7	7	7	8	11	56	62	62	86	84
	99%	8%	8%	8%	8%	8%	9%	12%	63%	70%	70%	97%	94%
Baucau	208	20	16	12	13	12	14	23	39	62	102	163	129
	89%	10%	8%	6%	6%	6%	7%	11%	19%	30%	49%	78%	62%
Bobonaro	159	64	48	56	50	44	30	33	39	41	33	58	56
	88%	40%	30%	35%	31%	28%	19%	21%	25%	26%	21%	36%	35%
Covalima	122	49	46	31	20	18	16	13	16	19	41	71	65
	97%	40%	38%	25%	16%	15%	13%	11%	13%	16%	34%	58%	53%
Dili	71	16	17	18	14	14	18	16	16	24	28	58	55
	79%	23%	24%	25%	20%	20%	25%	23%	23%	34%	39%	82%	77%
Ermera	232	114	46	37	48	47	48	86	125	155	166	167	148
	99%	49%	20%	16%	21%	20%	21%	37%	54%	67%	72%	72%	64%
Liquiça	116	20	14	17	18	25	25	46	59	93	97	95	83
	92%	17%	12%	15%	16%	22%	22%	40%	51%	80%	84%	82%	72%
Lautem	123	54	36	41	44	48	58	37	42	48	36	51	38
	98%	44%	29%	33%	36%	39%	47%	30%	34%	39%	29%	41%	31%
Manufahi	60	23	16	14	10	9	9	7	9	20	35	42	38
	67%	38%	27%	23%	17%	15%	15%	12%	15%	33%	58%	70%	63%
Manatuto	62	38	27	24	16	14	15	15	17	17	31	47	45
	86%	61%	44%	39%	26%	23%	24%	24%	27%	27%	50%	76%	73%
Oecussi	58	20	27	22	21	20	10	3	8	9	11	11	7
	36%	34%	47%	38%	36%	34%	17%	5%	14%	16%	19%	19%	12%
Viqueque	137	95	96	91	88	89	91	91	86	93	101	107	107
	85%	69%	70%	66%	64%	65%	66%	66%	63%	68%	74%	78%	78%
Total	1,543	540	412	387	365	363	361	411	593	727	806	1013	913
	86%	35%	27%	25%	24%	24%	23%	27%	38%	47%	52%	66%	59%
Male Respondents	1,002	316	241	228	214	208	203	253	392	493	547	682	614
	89%	32%	24%	23%	21%	21%	20%	25%	39%	49%	55%	68%	61%
Female respondents	541	224	171	159	151	155	158	158	201	234	259	331	299
	81%	41%	32%	29%	28%	29%	29%	29%	37%	43%	48%	61%	55%

2.7.4 Purchase of Rice in the Last Year

The respondents were asked in which months of the previous year they had bought rice for food, and how much. Table 62 shows that nearly all households in all districts bought rice during the year, and 62% bought rice every month.

Table 62. Number of Months Rice was bought

Districts	Number of months in which the household bought rice												# of HHs that bought rice
	1	2	3	4	5	6	7	8	9	10	11	12	
Ainaro					4	11	9	3	4			76	107
Aileu		1		6	5	13	7					58	90
Baucau			1	5	6	8	14	4	7	3		185	233
Bobonaro	1	5	10	21	29	18	18	22	14	18	5	18	179
Covalima				4		4	6	3	4	10	1	94	126
Dili			1	1	4	5	1	2	3			72	89
Ermera			2	16	1	41	3	1	2	2		166	234
Liquiça		1	1	3	3	4	1	1		1		111	126
Lautem			2	2	1	4	1	1				114	125
Manufahi												90	90
Manatuto												72	72
Oecussi		1	1	6	5	15	21	35	21	8	1	47	161
Viqueque	1	13	41	29	26	19	14	1	1		1	14	160
Total and %	2	21	59	93	84	142	95	73	56	42	8	1.117	1.792
of all HHs	0.1%	1.2%	3.3%	5.2%	4.7%	7.9%	5.3%	4.1%	3.1%	2.3%	0.4%	62.1%	99.6%

The frequencies for 4 and 6 months are higher than the frequencies for the months preceeding and following them, because some households have the habit of buying rice once a quarter, or every two months, a pattern which is very noticeable in Ermera.

Table 63 shows in which months the respondents bought rice. There does not seem to be a particular pattern in the rice buying, as the percentages of rice buying households went down and up from month to month. It is noticeable that in any given month at least 75% of the rice buying households – which are nearly all households – bought rice. Table 64 shows the total amounts of rice bought per month, based on the amounts reported by the respondents. On average, a rice buying household bought 39 Kg of rice per month.

Table 63. Months when Rice was bought

# of months rice was bought	# of HHs that bought rice	Months in which households bought rice											
		Oct '10	Nov '10	Dec '10	Jan '11	Feb '11	Mar '11	Apr '11	May '11	Jun '11	Jul '11	Aug '11	Sep '11
1	2									1			1
2	21	3		3	3	3	2	5	3	4	6	3	7
3	59	34	3	6	12	26	9	11	13	21	10	6	26
4	93	65	4	14	42	33	17	42	24	28	39	12	52
5	84	60	13	24	53	25	22	37	28	28	39	22	69
6	142	117	29	108	48	103	35	91	39	86	41	82	73
7	95	83	34	75	39	68	46	60	32	54	37	52	85
8	73	61	54	62	56	60	51	47	31	32	29	36	65
9	56	47	44	47	51	51	43	38	34	32	32	34	51
10	42	42	41	42	42	42	35	26	17	32	30	31	40
11	8	8	7	8	8	7	7	8	6	8	7	6	8
12	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117	1,117
Total	1,792	1,637	1,346	1,506	1,471	1,535	1,384	1,482	1,344	1,443	1,387	1,401	1,594
% of HHs that bought rice		91%	75%	84%	82%	86%	77%	83%	75%	81%	77%	78%	89%

Table 64. Amounts of Rice bought

	Oct '10	Nov '10	Dec '10	Jan '11	Feb '11	Mar '11	Apr '11	May '11	Jun '11	Jul '11	Aug '11	Sep '11
Amount of rice bought by the sample households (kg)	66,562	52,642	58,319	57,512	60,160	53,132	57,416	52,187	55,828	53,577	52,915	64,065
Average amount of rice bought by a rice buying household (kg)	40.7	39.1	38.7	39.1	39.2	38.4	38.7	38.8	38.7	38.6	37.8	40.2

2.8 Agricultural Extension and Participation in Groups

2.8.1 Interaction of Farmers with Agriculture Extension Workers

All respondents were asked if they knew the MAF Suco Extention Offier (SEO) in their suco, and if yes, how they rated the service provided by the SEO. Table 65 shows that, on average, 43% of the respondents know their SEO, but the figure varies between 73% in Bobonaro to only 3% in Viqueque – which seems abnormally low. The respondents also mostly rate the services good (72%) and satisfactory (17%), although in Oecussi, Manatuto and to a lesser extent in Covalimaand in Bobonaro, some SEOs are also rated bad and very bad.

Table 65. Farmers who know the MAF Extension Officer in their Suco, and Rating of Services

Districts	Number of respondents			% of respondents in district	Rating of services				
	Male	Female	Total		Very bad	Bad	Satis-factory	Good	Very good
Ainaro	33	8	41	38%	1	1	3	36	
Aileu	47	15	62	69%		1	8	52	1
Baucau	120	43	163	70%	1	8	41	106	7
Bobonaro	89	43	132	73%	5	6	16	103	2
Covalima	46	25	71	56%	4	5	10	51	1
Dili	20	12	32	36%	1		2	29	
Ermera	15	8	23	10%		1	6	16	
Liquiça	8	2	10	8%		1	1	8	
Lautem	27	36	63	50%			16	45	2
Manufahi	37	10	47	52%	3	2	11	31	
Manatuto	43	8	51	71%	4	6	12	29	
Oecussi	28	41	69	43%	9	12	2	46	
Viqueque	4	1	5	3%		1		4	
Total	517	252	769		28	44	128	556	13
	67%	33%	100%	43%	4%	6%	17%	72%	2%
			Male respondents		18	30	87	371	11
			Female respondents		10	14	41	185	2

Table 66 shows that in the six months prior to the baseline survey 68% of the delivered services were in the form of visits to the farmers, followed by seeds (26%), training (21%) and chemical fertilizers (15%). If measured against the total number of households in the survey, 29% of the farmers were visited by the SEOs, and 11% received seed inputs.

Table 66. Type of Extension Services received in the past Six Months

Type of extension service	Number of respondents			% of households	
	Male	Female	Total	that receive services	in baseline survey
Visits	357	165	522	68%	29%
Seeds	143	54	197	26%	11%
Training	111	49	160	21%	9%
Chemical fertilizer	78	37	115	15%	6%
Participation in exposure visits	64	37	101	13%	6%
Advice	50	28	78	10%	4%
Chemical pesticides	31	28	59	8%	3%
Tools	26	22	48	6%	3%
Total	517	252	769		43%

2.8.2 Participation in Groups

The respondents were asked if they, or someone else in the household, participated in one or more groups that exist in the community. Table 67 shows that, on average, 23% of the households participated in one or more groups, but with a noticeable difference between the answers obtained from the male respondents (where 27% participated in groups) and that from the female respondents (17%). On average, 57% of the households participate in one group, 27% in two groups and 12% in three groups.

Table 67. Participation in Groups

	HHs in which the respondent or other HH members participate in groups		Number of groups in which the respondent or other household members participate (% of households in district that participate in groups)				
	Number	% of HHs	One	Two	Three	Four	Five or more
Total	422	23%	57%	27%	12%	3%	0.9%
Male respondents	310	27%	55%	28%	13%	3%	1.3%
Female respondents	112	17%	63%	24%	11%	3%	

As for the type of groups in which the respondents participate, Table 68 shows that the highest percentage overall is for farmer groups or associations (54% of the households that participated in groups, participated in such a group) but with a markedly higher participation by the households of male respondents (76%) than that of the female respondents (24%).

Table 68. Type of Groups in which Respondents and other Household Members participate

Type of group	No.	% of corresponding group, by gender of respondent		% of HHs that participate in groups	% of HHs in baseline survey
		Male	Female		
Farmer groups/association	227	76%	24%	54%	13%
Adat	179	81%	19%	42%	10%
Religious group	98	72%	28%	23%	5%
Youth group	44	89%	11%	10%	2%
Savings & loans / credit groups	38	63%	37%	9%	2%
Coffee group	31	77%	23%	7%	2%
Women association/OMT	29	34%	66%	6%	2%
Farmer cooperative/association	28	86%	14%	6%	2%
Health group	20	65%	35%	5%	1.1%
Other	11	82%	18%	3%	0.6%
HHs that participate in groups	422	73%	27%		23%

Table 69 shows that, overall, some 16% of the households have participated in training activities, with 19% participation of the households with a male respondent and 12% participation of the households where the respondent was a woman. The majority of the households (71%) have only participated or attended one training.

Table 69. Participation in Training

	Housholds in which the respondent or other HH members have participated in training		Number of training events in which the respondent or other household members have participated (% of households in district that attended training)				
	#	% of HHs	One	Two	Three	Four	Five
Total number	296	16% of surveyed households	71%	20%	7%	1.4%	0.7%
Male respondents	216	19% of male respondents	69%	21%	7%	2%	0.9%
Female respondents	80	12% of female respondents	75%	18%	8%		

The most common type of training event in which survey households members had participated (as shown in Table 70) were Farmer Field Days (47% of the households in which members had attended training, and 8% of all households in the survey). Seed production and storage, and water and sanitation, were the second and third most frequently attended type of training events.

Table 70. Type of Training Events in which Respondents and other Household Members have participated

Type of training	No.	% of corresponding type of training, by gender of respondent		% of HHs that attended xtraining	% of HHs in baseline survey
		Male	Female		
Farmer Field Day	140	76%	24%	47%	8%
Seed production and storage	95	74%	26%	32%	5%
Water and sanitation	67	82%	18%	23%	4%
Nutrition	33	70%	30%	11%	2%
Integrated Crop Management	22	82%	18%	7%	1.2%
Marketing	20	70%	30%	7%	1.1%
Gender	15	53%	47%	5%	0.8%
Savings & loans	10	40%	60%	3%	0.6%
Climate change	9	78%	22%	3%	0.5%
System of Rice Intensification	4	100%		1.4%	0.2%
HHs that attended training	296	73%	27%		16%

3. Discussion and Recommendations

At the end of the current phase of the Seeds of Life program, the achievements of the program will be assessed on the basis of improvements made during the period 2011-2016. In this chapter, these basic conditions as they were in late 2011 are discussed, and some recommendations are made for follow-up and future assessments.

3.1 Reduction in Experience of Food Shortage

One of the performance indicators to assess the success of the Seeds of Life program is the extent in reduction of the periods of food shortages that the farmers experience. The aim is to achieve a 33% reduction over the period 2011-2016.

The baseline survey questionnaire did not include the question "*Were there periods in the last year when your household did not have enough food? If yes, what months were these?*".
In the baseline survey, the respondents were asked in which months they were able to consume the food they had grown themselves, the months in which they consumed wild foods, and the months in which they bought rice. The baseline survey also used the HFIAS tool to assess food insecurity at household level, but the problem with this latter indicator is that the timing of the data collection very much influences the result; if the data is collected in a month when many families still have self-grown food in storage, or they can obtain food through purchase in the market, the the HFIAS score will not indicate high levels of household food insecurity.

The data from Table 58 can however be used to calculate the average period when food from self-grown crops can be consumed. Table 71 shows for each of the five crops the median, the mean and the standard deviation for the average period in months when farmers can consume self-grown crops.

Table 71. Average Period of Availability for Consumption in Months of Self-Grown Crops

Crop	Median *(Months)*	Mean *(Months)*	Standard deviation *(Months)*
Corn	5	5.5	2.3
Rice	4	4.6	2.3
Peanut	3	3.8	2.0
Cassava	5	5.1	3.1
Sweet potato	4	4.3	2.4

For the follow-up surveys in years 3 and 5, it is recommended that the question of lack of food during specific months be included in the questionnaire, and preferably with reference to the period when the interview takes place, and how this compares to two years ago. This information will provide an additional way – albeit subjective – to assess to what extent food availability has improved.

3.2 Number of Farmers Reached by the Seeds of Life Program

3.2.1 Definition of "Farmers" for SoL M&E Purposes

How many farmers have access to, and use the varieties of seeds and cuttings that have been released by MAF/SoL? A simple question but, unfortunately, not one that can be simply answered. First of all, there has to be agreement on the definition of a "farmer". Does a household in which both the husband and wife work in agriculture count as two farmers? Or should such a household be counted as one farming unit? For M&E purposes of the MAF/SoL program, a household will be counted as one unit.

Secondly, the type of household must be clearly defined. There is a choice between a rural household, a household involved in agriculture, or a household involved in crop production. This distinction is important because the numbers for these types of household is different. Not all rural households are engaged in agriculture, and not all households engaged in agriculture are engaged in crop production, or in foodcrop production more specifically. In the 2010 census, the "total number of private households (rural)" in Timor-Leste was 136,929, and the "number of households involved in crop production" was 116,426. It should be noted that this latter number also includes, among other, coffee and coconut treecrop growers. For M&E purposes, the achievements of the MAF/SoL program will be benchmarked against the number of households involved in crop production, because this data is available from the census.

3.2.2 Estimate of Number of Farmers and MAF/SoL Variety Growers in 2015

In mid-2010, at the time of the census, there were 116,426 households engaged in crop production, and 45,672 were growing rice, 102,346 were growing corn, and 94,833 were growing cassava. What will those numbers likely be in 2015? And what number of MAF/SoL variety growers may we expect by that time?

The estimates on growth rates in Timor-Leste vary significantly. The 2010 census mentions an annual population growth rate of 2.41%, based on the growth in population between the 2004 census and the 2010 census. The UN Data website estimates the average annual population growth rate over 2010-2015 to be 3.4%, and the rural growth rate over the same period 2.7%[24]. According to World Bank data, the annual rural population growth rates over the period 1990-2012 were as shown in Figure 18 [25].

[24] Data.un.org, accessed on 25 August 2012

[25] www.tradingeconomics.com/timor-leste/rural-population-growth-annual-percent-wb-data.html, accessed on 25 August 2012

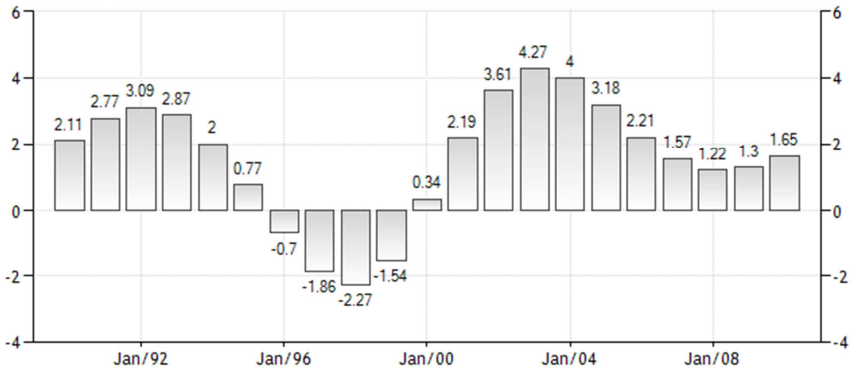


Figure 18. Rural population growth rates in Timor-Leste (1990-2012)

Recognizing the variability and uncertainty of rural population growth estimates, we assume an average annual growth rate of 2%. This results in projected rural population figures as shown in Table 72. The total number of households engaged in crop production in 2015 can thus be estimated, rounded off, to be 128,500.

Table 72. Projection of Households engaged in Crop Production (2010-2015)

	2010	2011	2012	2013	2014	2015
Households engaged in crop production (assuming 2% growth)	116,426	118,755	121,130	123,552	126,023	128,544

As mentioned in Table 20, in 2011 17.9% of the farmers in the survey were growing MAF/SoL varieties. This means that in 2011, for Timor-Leste as a whole, an estimated 21,258 farmers were using improved varieties.

If there are no relative changes in crop choice combinations of the farmers engaged in crop production – i.e. the percentages of crop cultivation mentioned in Table 7 remain unchanged over the period 2011-2015 – then the projected number of crop growers is expected to evolve as shown in Table 73.

Table 73. Projected Number of Households growing Five Foodcrops (2010-2015)

Crop	2010	2011	2012	2013	2014	2015
Corn	102,346	104,393	106,481	108,610	110,783	112,998
Rice	45,672	46,585	47,517	48,467	49,437	50,426
Peanut	26,778	27,314	27,860	28,417	28,985	29,565
Cassava	94,833	96,730	98,664	100,638	102,650	104,703
Sweet potato	62,870	64,127	65,410	66,718	68,053	69,414

Projections for corn, rice and cassava based on the census 2010 data.
Projections for peanut and sweet potato based on the baseline survey data.

3.3 Adoption of MAF/SoL Varieties

The second indicator at the purpose level in the M&E framework, states that "*90% of farmers adopting MAF/SoL released varieties reporting increased yields*". During the baseline survey, in October 2011, the farmers who cultivated a MAF/SoL variety were asked how the productivity of that variety compared to a local variety. The obtained results of these assessments are presented in Table 74.

Table 74. Comparison of Productivity of MAF/SoL varieties with Local Varieties

Crop, *variety*	# of farmers reporting on productivity	Much better than local variety	Better than local variety	Same as local variety	Worse than local variety	Much worse than local variety	Don't know/ remember
Maize, *Sele*	138	102	8	25	2		1
Rice, *Nakroma*	55	31	20	4			
Peanut, *Utamua*	46	31	10	2		2	1
Cassava, *Ai-luka 2*	35	21	9	5			
Cassava, *Ai-luka 4*	15	9	6				
Sweet potato, *Hohrae 1*	40	27	11		1		1
Sweet potato, *Hohrae 2*	16	8	7	1			
Sweet potato, *Hohrae 3*	15	6	9				
MAF/SoL varieties, combined	360	235 65.3%	80 22.2%	37 10.3%	3 0.8%	2 0.6%	3

Overall, 87.5% of the MAF/SoL variety growers considered that these varieties yielded better or much better than the local varieties, and only 1.4% of the MAF/SoL variety growers thought they yielded worse or much worse than the local variety.

3.4 Recommendations

3.4.1 Questionnaire

During the analysis of the survey data, it became clear that better quality data, or more easily analysable data, might have been obtained if some questions in the questionnaire had been formulated differently, or if the questionnaire had included occasional checks. This section offers a few recommendations for the follow-up surveys.

- **Seed varieties of foodcrops**. At this section of the questionnaire there should be a box note for the interviewer drawing his or her attention that it is rather unlikely that a farmer will only cultivate one variety of a foodcrop. If a farmer only reports one variety for a crop, the interviewer should probe whether this is indeed the case, or if other varieties are grown as well. This should help prevent a repeat of what happened in Viqueque where all the interviewed farmers grew MAF/SoL varieties of the crops, and only MAF/SoL varieties.
- **Seed varieties of foodcrops**. The questionnaire should include the new varieties that are released by the Ministry (such as the white maize variety *Noi Mutin* released in mid-2012), as well as – space on the questionnaire form permitting – popular crop varieties that were not listed in the baseline survey questionnaire.

- **Adaptation to climate change**. The baseline survey questionnaire included two question that assessed rainfall patterns during stages of corn growth, and conditions of the corn cobs at the time of harvest. The quality of the data was however poor, and the analysis of that data was therefore not included in this report. Other questions of farmers' perceptions of changes in long-term weather conditions, and the coping mechanisms they use to address these, may perhaps yield more robust information.
- **Seed markets and seed fairs**. As the MAF/SoL program expands, marketing of surpluses produced by the Community Seed Production Groups, and the distribution of seeds through seed fairs, voucher for poor households and district level agriculture information events, will gain in importance. The questions that seek to obtain such information will have to be elaborated.
- **Corn storage**. This section includes an estimate on how much corn was lost in storage, and several farmers provided answers in excess of 50%. While not impossible, this is not very likely. It is therefore recommended that the questionnaire includes a box note in this section on corn storage to ask the interviewers to specifically check with the farmer that he or she understood the question correctly if the answer to the amount of corn lost is storage is more than 50%. It could be that the farmer is thinking of the amount that is still usable after storage.
- **Corn storage**. In the list of possible answers asking the manner how corn is stored, one answer is "nothing is stored; everything is sold". As local corn markets develop, and especially if there is demand for more productive seed, more farmers may be inclined to sell part of their corn harvest. The question should be rephrased asking what part of the harvest, or how much corn the farmer has sold.
- **Corn storage**. As there will be a big increase in the availability of metal drums for corn storage, it is recommended that there are some follow-up questions for the farmers that report to store corn in this manner.
- **Food security**. It is recommended that the section on food security specifically asks the farmers if the household experienced a hungry season in the last year, and during what months. Added to this question, if the answer is yes, the respondent could be asked what coping strategies were used to deal with this food shortage.
- **Group membership**. The respondents were asked what possible groups members of the household belonged to, but the questionnaire did not ask whether it was the man, or the husband, or both that were members of such groups. In the follow-up surveys, clarification whether the husband or wife, or both, are members can be part of the question.
- **An "end of interview" checklist**. At the end of the interview, there should be a checklist for the interviewer so that s/he can quickly assess the consistency of the answers given in different sections. One example concerns the number of the five main crops cultivated; the number of main crops mentioned at the start of the interview should match with the foodcrop production in the previous year, the types of crops mentioned in the seed section, and with the crops consumed in the food security section. Another example is the question on household assets and the storage of corn. If the farmer reports the use or presence of a drum in either the section on corn storage, or in the section on household assets, the interviewer should check whether the drum is also reported in the other section.

3.4.2 Training of Field Interviewers and Field Supervisors

In the preparation for the survey, the field enumerators and field supervisors followed a one week training to familiarize themselves with the questionnaire, and tried out the questionnaire with some farmers that were not included in the sample. To improve the quality of the data collection process, the training of field interviewers and field supervisors should include the following.

- **Review of the data quality of the baseline survey**. During the training of field interviewers and field supervisors for the follow-up surveys, problems encountered with the filled-in forms of the baseline survey should be discussed. This may help to increase the awareness of the interviewers and supervisors to particular sections of the questionnaire.
- **The HFIAS questions in the section on food security**. The answers to these questions can provide valuable information, but the questions have to be asked correctly, and the interviewers must have a good understanding of the questions, and develop a feeling to assess whether the respondent correctly understands what is being asked.
- **Consistency checks between sections of the questionnaire**. The interviewers and supervisors should be aware what data items in what sections should be consistent with data items in other sections of the questionnaire (e.g. that cultivating only one variety of a crop is uncommon; that the number of main crops should be consistent in different parts of the questionnaire; that it may seem odd to have a small harvest of a crop, but still be able to consume it during most of the year; etc). Checking this may add a few minutes to each interview, but it will help to spot possible mistakes during data collection, and will result in better data.

3.4.3 Data Analysis and Report Writing

During data analysis, there was often need to check the original questionnaires because the electronic data was not complete, or showed unlikely answers. Data analysis and report writing took also much longer than anticipated.

Considering that the M&E unit has an ambitious workplan of case studies linked to various aspects of the program, implementing the follow-up surveys in the same way as the baseline survey may not be realistic. It is recommended that an external party (e.g. a firm or NGO experienced with conducting surveys) be contracted to manage the survey, analyse the data and prepares the report.

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Farmers

Last but not least, the baseline survey would not have been possible without the 1,800 respondents in the 100 Sucos who gave about an hour of their time to be interviewed about their experience and practices in foodcrop cultivation. We thank them for their willingness to participate in the baseline survey.