



The Democratic Republic of Timor-Leste
Ministry of Agriculture and Fisheries

Seeds of Life
Fini ba Moris



Adoption Survey 2014



Seeds of Life

Fini ba Moris



Seeds of Life 3

2014

Adoption Survey

Report

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

Dili, October 2014

This report summarizes the findings of the 2014 Seeds of Life Adoption Survey carried out by the Ministry of Agriculture and Fisheries/ Seeds of Life program, with the assistance of an External Consultant recruited by Seeds of Life.

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 Australian Aid, Department of Foreign Affairs and Trade (DFAT), plus the Australian Centre for International Agricultural Research (ACIAR) and is managed by ACIAR. The Centre for Plant Genetics and Breeding (PGB) within the University of Western Australia (UWA) coordinates the Australian funded activities.

Foreword

The Ministry of Agriculture and Fisheries of Timor-Leste through the Seeds of Life program is helping to fill an important gap in national food production and supply by increasing farming family access to quality planting materials of the major food crops they commonly cultivate.

The objective of the Seeds of Life program is to ***improve food security through increasing the productivity of staple crops*** (maize, rice, peanut, sweet potato and cassava). To date, the Ministry has released 12 crop varieties that grown under normal farmers' practice are 25-130% higher-yielding than local varieties of the same crops.

The major focus of activities until the end of the program in mid-2016 is to ***establish a sustainable national seed system*** that ensures farming families can always access quality planting materials of these improved varieties. The National Seed System for Released Varieties (NSSRV) is already the primary source of locally produced higher yielding food crop seed and cuttings.

The NSSRV's two complementary approaches: (i) production of *certified seed* and *commercial seed* through contract growers and registered commercial seed producers in each district and (ii) production of *community seed* by community seed production groups in each village, are not only increasing farm family access to good quality planting materials of higher yielding varieties but also increasing seed security and sovereignty at district and national level by reducing MAF dependency on annual importations of rice and maize seed.

This 2014 Adoption Survey report provides valuable information for the Ministry and Seeds of Life on the access and uptake of improved varieties throughout the country, and offers insights to support the program's joint efforts to establish a sustainable National Seed System on which to build further farm family development.

Dili, 29 October 2014



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Abbreviations and Acronyms

ACIAR	Australian Centre for International Agriculture Research
AS	Adoption Survey (2014)
CSP	Commercial Seed Producer
CSPG	Community Seed Production Group
CCT	Cooperativa Café Timor
DFAT	Department of Foreign Affairs and Trade
FA	Farmers' Association
HH	Household
HoH	Head of Household
IFAD	International Fund for Agricultural Development
MAF	Ministry of Agriculture and Fisheries
MTS	Mid-Term Survey (2013)
NGO	Non Governmental Organization
SEO	Suco Extension Officer
SoL	Seeds of Life

Executive Summary

The third phase of the Seeds of Life program is now only two seasons from its end. The first objective of this adoption survey is to provide the program with accurate data regarding the progress achieved in terms of increased adoption of MAF-SoL varieties.

This survey was conducted in 60 sucos across 13 districts and involved 702 respondents (all growing at least one of the following food crops: maize, rice, peanut, cassava and sweet potato). Data collection was conducted electronically using tablets over a period of four weeks in August-September 2014.

Increase in Adoption of MAF Varieties

	Baseline survey (2011)	Mid-term survey (2013)	Adoption survey (2014)
Adoption of one or more MAF varieties (national):	18%	25%	33%
Regional: West	12%	18%	25%
Centre	20%	26%	39%
East	31% ¹	32%	39%
Program related: Districts of early SoL2 ²	30%	36%	42%
Other districts	11%	20%	29%
Adoption per variety: Sele	13%	15%	20%
Noi-Mutin	-	2%	10%
Nai	-	-	0.3%
Nakroma	11%	15%	14%
Utamua	16%	11%	12%
Hohrae	7%	7%	9%
Ai-luka	3%	3%	5%

The main factors that were found to be influencing adoption of MAF varieties are linked to Community Seed Production Groups (CSPGs). The fact that there is a CSPG in the suco, knowing about its existence as well as being a member of a CSPG increases the chances that farmers will be adopters.

While the main reason for wanting to grow a MAF variety appears to be because it was given free, as promotion, awareness and access to improved varieties increases with decentralisation and commercialisation of quality seed production and supply, a more positive motivation is likely to emerge.

¹Excluding Viqueque and Lautem

²Liquica, Aileu, Baucau and Manufahi

Characteristics of Adopters

	First source of seeds or cuttings	Average area grown per adopter	Proportion of adopters growing MAF varieties for more than one year	Average duration of adoption (years)	Proportion of adopters planning to continue growing the MAF variety
Sele	43% MAF	0.3 ha	42%	1.9	99%
Noi-Mutin	52% MAF	0.3 ha	20%	1.4	98%
Nakroma	50% MAF	0.4 ha	52%	2	97%
Utamua	34% MAF	0.1 ha	48%	1.9	96%
Ai-Luka	30% CCT	0.2 ha	27%	1.6	100%
Hohrae	52% MAF	0.1 ha	49%	2.1	100%

Familiarity with MAF Varieties

Overall, 25% of farmers have heard of at least one MAF variety. The most known varieties are Nakroma (32% of the rice farmers who do not yet grow Nakroma, equivalent to 9% of the farmers), Sele (15% of non-Sele growing maize farmers, 12% of farmers), Noi Mutin (13% of the maize farmers who do not yet grow Noi Mutin; 12% of farmers) and Utamua (10% of non-Utamua growing peanut farmers; 3% of farmers).

As expected, a higher proportion of farmers familiar with MAF varieties are located in districts with longer involvement in the program. Also, the fact that a farmer lives in a suco where there is a CSPG doubles the chance that he will be familiar with those varieties (42% versus 21% for farmers living in sucos where there isn't any CSPG).

Participation in Community Seed Production Groups

In general, a lot of farmers still aren't aware of the existence of CSPGs. In fact, 49 of the 60 sampled sucos had existing CSPGs but only 22% of the respondents said they were aware there is a CSPG in their suco. While many farmers (46%) said there wasn't a CSPG in their suco, in the majority of cases (75%) there actually.

About a third of the farmers who said they knew about the existence of a CSPG in their suco were actually members of it and half of these (48%) had been members for only one year³.

³ Due to rate of program expansion: from 2011 (a total of 280 CSPG in 7 districts), 2012 (680 CSPG in 10 districts) and 2013 (1018 CSPG in all 13 districts). A total of >1,350 CSPG are planned for 2014.

Food Security

82% of respondents said their family experienced “hungry months” during the year. On average, this hungry season lasted 3.6 months.

Data about consumption of self-grown food crops was also collected to calculate periods of food shortage (i.e. periods when families have no self-grown maize, rice, peanut, cassava or sweet-potato to eat). 81% of the respondents experienced at least one month of food shortage and on average the duration of food shortage was 4.2 months.

This result seems incoherent with the 2013 finding (2.7 months of food shortage) and suggests that farmers probably underestimated their food-consumption in the current survey.

Impact Related Questions

Among the five statements that respondents were asked to give their opinion about, the most popular statement was that growing MAF varieties has helped the family to diversify the crop varieties it is growing. Also, growing MAF varieties is very often related to an increase in food produced for the family but not necessarily to a decrease in the number of hungry months. Lastly, growing MAF varieties is often not related to “becoming less poor” as most farmers do not consider them cash crops.

Conclusion and Recommendations

For mid-2014, it is estimated that 40,957 households have adopted at least one MAF variety. The SoL3 program is therefore well on its way towards achieving its end-of-program target: 50% of rural crop producing households have adopted at least one MAF variety.

To significantly increase adoption in the coming season the main recommendations are:

- increase access to seeds in the western region where adoption is much lower than in other regions;
- support MAF (and other agencies/NGOs) to increase the effectiveness of their seed distribution;
- increase publicity, control and guidance of existing CSPGs in order to ensure these groups ensure a wider diffusion of seeds and cuttings into their local communities.

Rezumu Ezekutivu

Faze terseiru husi programa Seeds of Life agora dadaun hela epoka rua para ba nia final. Objetivu primeiru husi Levantamentu Adopsaun ida ne'e mak atu fornese dadus ne'ebé loloos ba programa relasionadu ho progresu ne'ebé atinji ona em termus de aumentu iha adopsaun ba MAP-SoL nia variedade sira.

Levantamentu ida ne'e halo iha suco 60 iha distritu 13 nia laran ne'ebé involve respondente nain 702 (sira ne'e hotu kuda maizumenus ida husi ai-horis tuir mai: batar, hare, forerai, ai-farina no fehuk midar). Rekollamentu dadus hala'o eletronicamente uja tabela durante períodu semana haat nia laran hahu iha fulan Agostu to'o-Setembru 2014.

Aumentu iha Adopsaun ba Variedade MAP

	Levantamentu Baze de Dadus (2011)	Levantamentu Térmu-Médiu (2013)	Levantamentu Adopsaun (2014)
Adopsaun ba variedade MAP oin ida ka liu (nasionál):	18%	25%	33%
Rejionál: Oeste	12%	18%	25%
Sentrál	20%	26%	39%
Leste	31% ⁴	32%	39%
Programa relasionadu: Distritu sira iha inísiu SoL2 ⁵	30%	36%	42%
Distritu sira seluk	11%	20%	29%
Adopsaun por variedade:Sele	13%	15%	20%
Noi-Mutin	-	2%	10%
Nai	-	-	0.3%
Nakroma	11%	15%	14%
Utamua	16%	11%	12%
Hohrae	7%	7%	9%
Ai-Luka	3%	3%	5%

Fatór prinsipál ne'ebé deskobre fó influensa ba adopsaun variedade MAP nian mak liga ba Grupu Komunidade Habarak Fini (GKHF). Sertamente, faktu hatudu katak wainhira existe GKHF iha suco laran no agrikultór sira hatene no sai membru maka iha possibilidade atu aumenta oportunidade ba agrikultór sira atu sai adoptadór.

Enkuantu razaun prinsipál kona-ba hakarak kuda variedade MAP nian ne'ebé lansa mak tanba variedade hirak ne'e fó gratuitu deit ba agrikultór sira, hanesan promosaun, konsiénsia no asesu hanesan membru GKHF aumenta ho descentralizasaun no komersializasaun produsaun no forneseimentu fini kualidade diak, sei mosu motivasaun ne'ebé positivu liu tan.

⁴La inklui Viqueque ho Lautem

⁵Liquica, Aileu, Baucau ho Manufahi

Karaterística husi Adoptadór

	Fonte primeiru husi fini (musan no kain)	Médiu área ne'ebé kuda husi kada adoptadór	Proporsaun adoptadór ne'ebé kuda variedade MAP liu husi tinan ida	Médiu durasau husi adopsaun (Tinan)	Proporsaun adoptadór ne'ebé planéia atu kontinua kuda variedade MAP
Sele	43% MAP	0.3 ha	42%	1.9	99%
Noi-Mutin	52% MAP	0.3 ha	20%	1.4	98%
Nakroma	50% MAP	0.4 ha	52%	2	97%
Utamua	34% MAP	0.1 ha	48%	1.9	96%
Ai-Luka	30% CCT	0.2 ha	27%	1.6	100%
Hohrae	52% MAP	0.1 ha	49%	2.1	100%

Familiaridade ho variedade MAP

Jeralmente, 25% husi agrikultór sira rona ou hatene kona-ba variedade oin ida husi variedade MAP. Variedade ne'ebé sira hatene liu mak Nakroma (32% husi agrikultór hare ne'ebé seidak kuda Nakroma, ekuivalénsia ba agrikultór 9% husi agrikultór sira), Sele (15% husi agrikultór batar ne'ebé seidak kuda Sele, 12% husi agrikultór sira), Noi Mutin (13% husi agrikultór batar ne'ebé seidak kuda Noi Mutin, 12% husi agrikultór sira) no Utamua (10% husi agrikultór forerai ne'ebé seidak kuda Utamua, 3% husi agrikultór sira).

Hanesan ida ne'ebé esperadu, proporsaun aas liu husi agrikultór sira ne'ebé familiar liu ho variedade MAP nian mak lokalizadu iha distritu ne'ebé nia involvimentu ho programa kleur liu. SoL. Nune'e mos, faktu hatudu katak agrikultór sira ne'ebé hela iha suco ne'ebé iha GKHF fo oportunidade dóbru ba sira atu familiar ho variedade hirak ne'e (42% versus 21% ba agrikultór sira ne'ebé hela iha suco ne'ebé laiha GKHF).

Partisipasaun iha Grupu Komunidade Habarak Fini

Em jerál, sei iha agrikultór barak mak seidak sente/hatene kona-ba existénsia husi GKHF. Faktu hatudu katak 49 husi 60 suco ne'ebé sai sample iha ona GKHF maibe iha 22% deit husi respondente mak haktuir katak sira sente ou hatene katak iha duni GKHF iha sira-nia suco laran. Enkuantu agrikultór barak (46%) haktuir katak sira la hatene kona-ba GKHF iha sira-nia suco laran, iha kazu mayoria atualmente iha (75%).

Maizumenus um térsu husi agrikultór ne'ebé haktuir katak sira hatene kona-ba existénsia husi GKHF iha sira-nia suco laran mak atualmente hanesan membru husi grupu ne'e no metade husi sira ne'e (48%) mak hanesan membru GKHF foin tinan ida.

Siguransa Ai-han

82% husi respondente haktuir katak sira-nia familia sente ou iha ona esperiénsia kona-ba “fulan hamlaha” durante tinan tomak nia laran. Tuir médiu, tempu rai hamlaha ida ne’e han tempu to’o fulan 3.6.

Rekolla mos dadus kona-ba konsumi ai-han ne’ebé kuda-rasik hodi nune’e bele kalkula períodu husi ai-han menu (ex. “períodu ne’ebé familia sira laiha batar, hare, forerai, ai-farina no fehuk midar ne’ebé sira kuda-rasik atu uja ba konsumi”). 81% husi respondente sira iha esperiénsia maizumenus fulan ida kona-ba ai-han menus no iha médiu durasaun kona-ba ai-han menus mak fulan 4.2.

Rezultadu ida ne’e inkoerente ho buat ne’ebé deskobre iha tinan 2013 (ai-han menus fulan 2.7) no sujere katak dalaruma agrikultór sira sub-estimadu sira-nia konsumi ai-han iha levantamentu atuál.

Pergunta Relasionadu ho Impaktu

Entre deklarasaun lima ne’ebé husu ba respondente sira atu fó sira-nia opiniaun, deklarasaun ne’ebé populár liu mak kuda variedade MAP ajuda familia sira diversifika variedade ai-horis ne’ebé sira kuda. Nune’e mos, kuda variedade MAP dalabarak relasionadu ho aumentu iha ai-han ne’ebé produs ba familia maibe la nesesariumente atu hamenus númeru fulan hamlaha. Ikus liu, kuda variedade MAP dalabarak la relasionadu ho “atu hamenus kiak” tanba mayoria agrikultór la konsidera hirak ne’e hanesan cashcrops/ai-horis ne’ebé bele fa’an.

Konkluzau no Rekomendasaun

Iha tinan klaran 2014, iha estimasaun katak umakain 40,957 mak adopta ona maizumenus ida husi variedade MAP. Tanba ne’e programa SoL3 kuaze la’o diak atu atinji nia tarjetu iha fin de programa: 50% umakain iha área rurais ne’ebé produs ai-horis adopta ona maizumenus ida husi variedade MAP.

Atu signifikamente aumenta adopsaun iha epoka tuir mai maka rekomendasaun prinsipál mak hanesan:

- aumenta asesu ba fini iha rejiaun parte oeste ne’ebé nia nível adopsaun menus liu kompara ho rejiaun sira seluk;
- fó apóiu ba MAP (ho ajénsia sira seluk/ONG) atu aumenta efikásia husi sira-nia distribuisaun fini;
- aumenta publisidade, kontrollu no orienta GKHF ne’ebé existe ona para atu asegura grupu hirak ne’e bele asegura difuzaun fini iha sira-nia comunidade laran.

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 Department of Foreign Affairs and Trade (DFAT). The goal of the SoL program is to improve food security through increased productivity of major food crops such as: maize, rice, peanut, sweet potato and cassava. To achieve this goal, SoL's focus is to improve access by Timorese farmers to high yielding varieties' seeds and cuttings.

In August-September 2014, an Adoption Survey was conducted to assess the program's achievements to date, especially in regards to the number of farmers reached.

This survey is a follow-up study to the 2013 Mid-Term Survey (MTS) as well as to the 2011 Baseline Survey. For that reason, all three surveys have followed a relatively similar approach in order for the collected data to be comparable and to accurately measure progress.

1.2 Sampling Methodology

The sample for this survey is based on the following criterion: 5% margin of error, 99% confidence level and a population of 136,929 rural households⁶.

To fulfil the above conditions, a total of 672 households were targeted to be interviewed which is similar to the MTS's sample size. An additional 26 households (two per district) were also visited to allow replacement of "incoherent/incomplete" questionnaires during data cleaning if required.

The following sampling approach was based on the approach taken for the MTS:

- Step 1: Distribution of the 672 households to be interviewed in each of the 13 districts proportionally to the total number of rural households per district.
- Step 2: Two additional households were added in each district as mentioned above.
- Step 3: The district sample sizes were divided by 12 to get the number of sucos to be sampled per district. The number of 12 households interviewed per suco was mainly chosen for logistical reasons: it is estimated that one enumerator can cover six households per day and that two enumerators could cover each one aldeia per suco.
- Step 4: The number of sucos to be sampled were rounded up.

⁶ From 2010 Population and Housing Census of Timor-Leste, Vol. 2. Note that taking into consideration an annual growth of the population of 2% doesn't impact the sample size as the total population is already very large.

Step 5: The number of households (HHs) per suco were rounded up as well to reach the total number of HHs to be interviewed in each district.

Then, sucos were selected randomly as well as two aldeias per suco using online randomizer software. Random farmers in the target aldeias were then visited directly in their houses when the team arrived in the locations. But in about 10 sucos, the local leaders had already gathered farmers to be interviewed in one location, or farmers were already gathered for another activity. In most of these cases, the team decided not to interview these farmers, or interview only one or two among them after having walked to their houses in order to ensure accuracy of the data and objectivity in the sampling.

The following table shows the planned sample versus actual interviews. In total, the AS covered 55% of the country's rural subdistricts, 15% of its' rural sucos, 6% of its' rural aldeias and 0.5% of Timorese rural households. Given that all the questionnaires were coherent and their information was complete enough, none of them were in the end taken out of the final sample. Hence, the final sample consisted of 702 farmers⁷, resulting in a slightly smaller margin of error: 4.85% instead of 5%.

Table 1. Sample per district

District	Numbers of respondents targeted	Number of respondents interviewed	Rural households ⁸	Number of sample sub-districts	Number of sample sucos
Ainaro	34	34	7,819	2	3
Aileu	40	40	6,521	2	3
Baucau	91	91	18,148	5	8
Bobonaro	72	72	14,162	4	6
Covalima	50	50	9,870	3	4
Dili	33	33	6,330	2	3
Ermera	91	92	18,132	5	8
Liquiça	49	49	9,596	3	4
Lautem	48	48	9,403	2	4
Manufahi	30	30	6,087	2	3
Manatuto	32	33	5,689	2	3
Oecusse	62	62	12,310	3	5
Viqueque	66	68	12,862	5	6
Total	698	702	136,929	37	60
Total for "rural" in Timor-Leste			136,929	67	400
Percentage			0.5%	55%	15%

As shown in the following map, only three sucos were also surveyed during the MTS (Triloca in Baucau, Beloi and Bicelli in Dili-Atauro). It is interesting to note that, in the two sucos surveyed in 2013 in Atauro, no adopters were met then. However, since the MTS, important efforts were made to increase access to seeds in Atauro (direct distributions to farmers and CSPGs), and the impact of this distribution shows up in this 2014 AS.

⁷ There were also an additional four interviews because in the districts Ermera, Manatuto and Viqueque more farmers were interviewed than planned.

⁸ From 2010 Population and Housing Census of Timor-Leste, Vol. 2

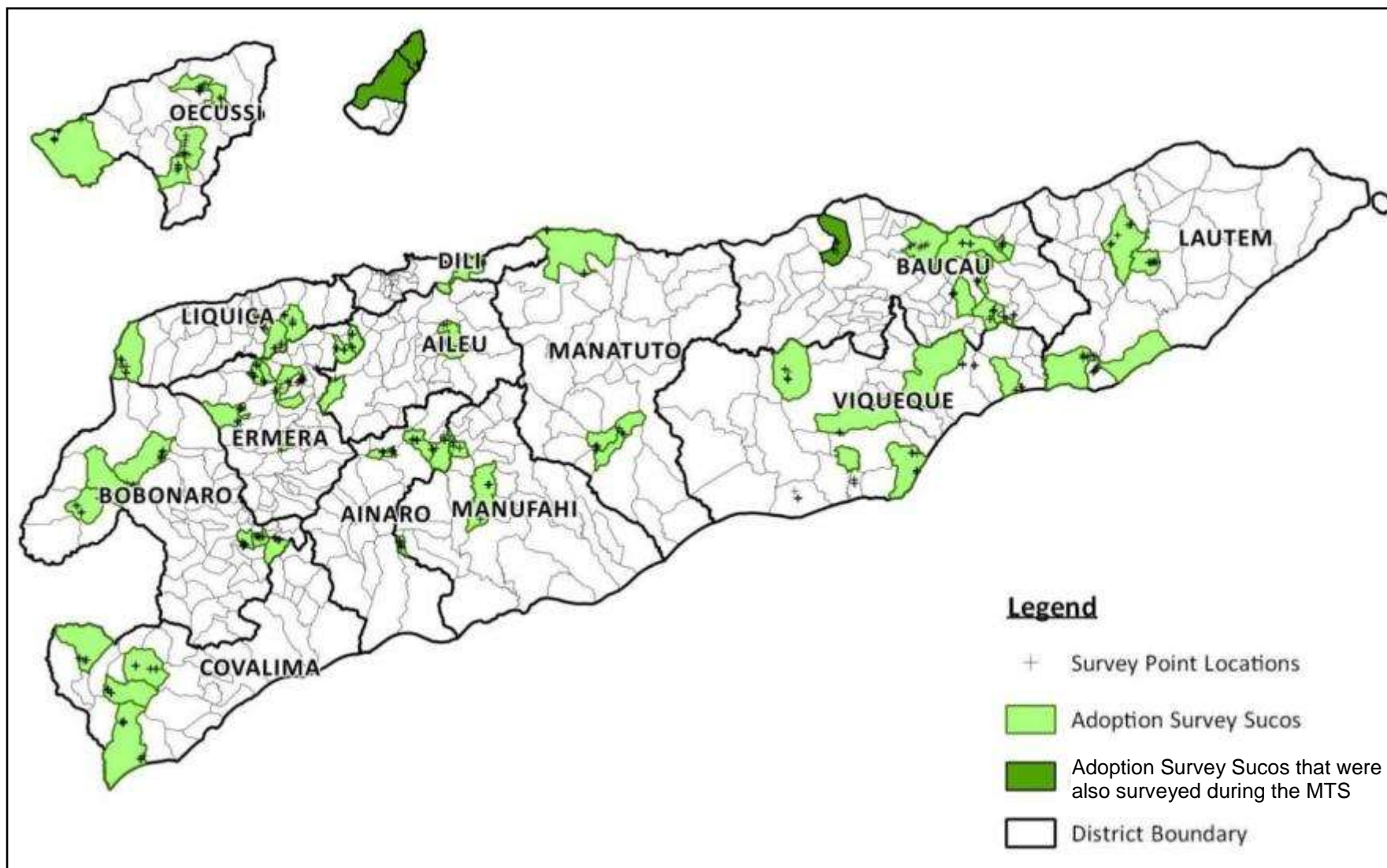


Figure 1. Location of sample sucos and respondents surveyed during the AS⁹

⁹ All the maps presented in this report were produced by Samuel Bacon, SoL3's Cropping Systems Advisor.

Also, note that 17 sucos of this sample were also part of the baseline survey sample which had a much larger sample. The detailed list of sucos is in Annex I.

Table 2 summarises data collected from secondary sources, including a parallel survey that was conducted with local leaders and Suco Extension Officers (SEOs) of the sampled sucos. As shown here, overall the situation in the sampled sucos is conducive to the adoption of MAF varieties:

- A large majority of sucos have CSPGs (one has a Commercial Seed Producer (CSP), formed through an association of CSPGs). But only 36% of the aldeias visited have CSPGs.
- In 2013 about two third of these sucos received MAF released seeds or cuttings from MAF directly¹⁰,
- About 80% of sampled sucos received Ai-luka and/or Hohrae cuttings early in 2013¹¹ during a large-scale distribution organised by MAF.

Also, it is important to note that 55% of the sucos where there is a CSPG are sucos where such CSPGs have been created only recently (in 2013 or 2014). Consequently, those groups have just finished multiplying seeds (or are going to) and most probably haven't shared seeds among their members yet or outside the group.

The following table also gives an idea of the degree of remoteness of the sampled aldeias. A remote aldeia is defined as an aldeia that can't be reached by car and/or is more than three hours' drive from the main district town. On average, 28% of the aldeias were remote, many of those being in Dili (Atauro), Manufahi, Manatuto and Viqueque. Such data will be useful to analyse the distribution of adopters later on.

¹⁰ Data collected from local leaders and SEOs by team supervisors in parallel of the main survey.

¹¹ About 18,000 stems of Ai-luka and 226,000 cuttings of Hohrae produced in SoL's research stations were distributed early 2013 by MAF to 301 groups in 120 sucos of 11 districts. Six months later, a monitoring survey revealed that about 87% of these groups had seen their cuttings survived and were still growing those varieties. During Dec '13 – Feb '14, there was another distribution of nearly half a million sweet potato cuttings, but there were no clear suco-by-suco records for all districts where these cuttings were delivered.

Table 2. Additional information on sampled sucos

District	% of sampled aldeias that are remote	% of sampled sucos with CSPGs or FAs	% of sampled aldeias with CSPGs or FAs	Known seeds/cuttings distributions in 2013 (% of sampled sucos)			
				Any MAF var. By MAF	Ai-luka By MAF	Hohrae By MAF	Sele & Noi Mutin By IFAD ¹²
Ainaro	50%	100%	66%	100%	100%	100%	0%
Aileu	0%	100%	50%	0%	100%	100%	100%
Baucau	31%	75%	19%	25%	88%	75%	0%
Bobonaro	0%	66%	25%	50%	83%	100%	0%
Covalima	50%	100%	38%	100%	100%	100%	0%
Dili	66%	66%	66%	66%	-	-	0%
Ermera	0%	63%	6%	50%	100%	100%	0%
Liquiça	12%	50%	25%	50%	75%	50%	0%
Lautem	0%	75%	25%	75%	100%	100%	0%
Manufahi	66%	100%	33%	100%	-	-	100%
Manatuto	66%	100%	83%	100%	100%	100%	100%
Oecusse	0%	100%	20%	100%	80%	60%	0%
Viqueque	66%	100%	25%	33%	50%	83%	0%
Average	28%	82% ¹³	36%	60%	87%	88%	15%

1.3 Survey Instrument

The questionnaire designed for this 2014 AS is mainly based on the MTS one but focuses more on adoption related questions. Also, two new varieties released by MAF were added to the list:

- Nai, an improved maize variety quite similar to Sele,
- Ai-luka 1, an improved cassava variety mainly used for producing modified cassava flour, which has been promoted to coffee farmers associated with the Cooperativa Café Timor.

Based on lessons learned from the implementation of the MTS, improvements were made in order to design the AS questionnaire:

- Additional questions regarding adoption of MAF varieties (especially regarding the length of adoption);
- Simplifications on the following sections were made: household general information, crops information (less quantitative information was collected as it was found to be often inaccurate), familiarity with MAF varieties, participation in groups (focus only on CSPGs), food self-sufficiency;
- The section on extension was removed as it wasn't a priority for this adoption survey;
- Impact-related questions were added as a "dry-run" for the End of Program survey in order to gain some experience on how to ask such questions.

¹² As part of IFAD's drum distribution activities, Sele and Noi Mutin seeds were distributed to each farmer buying a drum.

¹³ 49 sucos among the 60 sampled sucos have CSPGs- within or outside the sampled aldeias.

The 2014 AS questionnaire was designed to be shorter than the MTS one. This way, enumerators could spend more time on variety identification which is very challenging given the fact that most farmers do not know the names of the varieties they are growing. Enumerators used a “Variety Identification Check List” to help them identify the varieties grown by the farmer (see Annex II for the example check list for maize). The check list ensured enumerators would explore all possible sources of information to make sure that the varieties grown by farmers were MAF varieties or not.

On average, interviewing a non-adopter took 15 minutes while it could take 30 minutes to one hour for an adopter (depending on the number of MAF varieties grown).

Moreover, a parallel shorter survey was conducted by the Survey Supervisors to collect general information about access to MAF released seeds in the sampled sucos (results presented in Table 2).

1.4 Data Collection and Cleaning

A team of 11 enumerators was selected among those who conducted the MTS and new candidates. The team was split into three groups (each accompanied by a supervisor) and collected data during four weeks. On average, one district was covered within a week. A Survey Assistant and Coordinator supervised the data collection process in the field.

Comprehensive training was provided to all enumerators and supervisors prior to the data collection. Based on what was learned from the MTS, the training for this survey strongly focused on identification of varieties: four days were spent in the field to practice variety identification and pre-test the questionnaire with random farmers.



Figure 2. MAF researchers training enumerators in how to identify MAF varieties (Loes Research Station)

Data collection was done electronically using 7 inch tablets. Data was submitted over the internet to a server every day or second day. This process significantly contributed to improving data quality as data cleaning could be done very shortly after data was collected, and there were no further data entry errors due to data entry from paper copies to electronic format. Back-up paper questionnaires as well as back-up tablets were provided in cases of problems with the enumerator's tablets, but none were used.

In addition, weekly briefings with the survey team were conducted to discuss issues encountered during fieldwork before enumerators left for another week of data collection,

1.5 Data Analysis

Data submitted on the server was downloaded into an Excel format and then imported into the statistical software package SPSS for data analysis. For most results, the analysis was performed in the same way as for the MTS in order to allow clear comparisons between the MTS and the AS data.

Gender-disaggregated analyses were conducted for several key indicators of this survey. Results of such analysis are presented in this report only when actual correlations were found between those factors and the gender of the head of household (HoH).

2. Survey Findings

2.1 Household Demographic Characteristics

Such data is important to verify the representativeness of the sample surveyed. Here, it appears that the AS sample has similar characteristics as 2013's MTS sample in terms of gender of respondents met, as well as gender and age of chiefs of households. Also, the proportion of female headed households is close to the National Census data (13% versus 16% in the census¹⁴). In conclusion, the sample of this survey is representative enough of Timor-Leste's rural population.

To ensure that data collected would be as accurate as possible, enumerators tried to interview mainly head of households. That was possible for 65% of the interviews, which is the same proportion as in the 2013 survey. In other cases, chiefs of households were unavailable and another household member was interviewed.

Table 3. Characteristics of the Surveyed Population

Characteristic	% among respondents	
	MTS	AS
Number of visited households	672	702
• Male-headed households	92%	87%
• Female-headed households	8%	13%
• Male respondents	60%	55%
• Female respondents	40%	45%
Age of head of household (age categories)		
• < 29	18%	8%
• 30-39	21%	20%
• 40-49	23%	26%
• 50-59	23%	21%
• 60+	15%	25%

[Only 621 respondents in the AS answered questions on age of HoH]

Note that the heads of the households interviewed in this survey seem to be slightly older than during the MTS.

¹⁴ The last census in Timor-Leste was conducted in 2010.

2.2 Crops and Varieties Cultivated

2.2.1 Cultivation of Five Food Crops

One of the learnings of the MTS was that farmers often omit to mention some of the crops they are growing, often because they consider they grow only a small amount and that it isn't interesting for our team to know about. Consequently, for this survey, enumerators were asked to dig deeper in the identification of the crops grown by the household. This is probably why a slightly higher proportion of maize, peanut, cassava and sweet potato growers were met in comparison with 2013 or even the 2010 census (see Table 4).

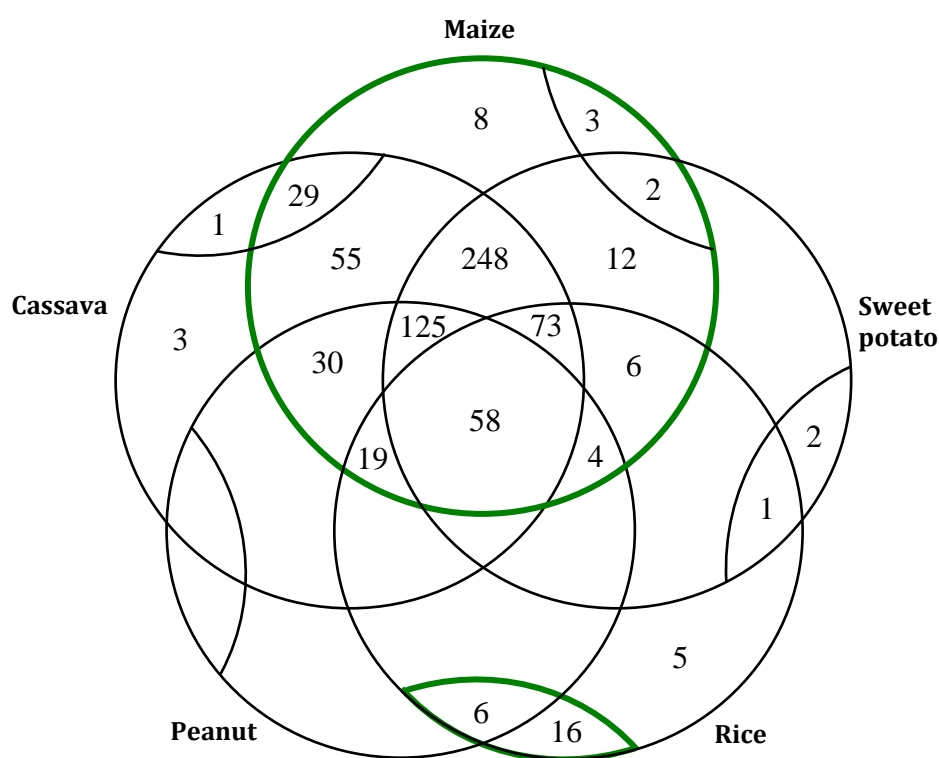
However, the proportion of rice growers is significantly lower than in the MTS and than in the 2010 census. This is due to the fact that the sampled sucros happened to be located in areas of small rice production. This is particularly true in Manatuto, Aileu and Bobonaro which are part of Timor-Leste's rice bowl. A significant proportion of respondents in those districts were growing rice in the MTS because sampled sucros were located in low lands with a lot of rice fields. While only a quarter of the AS sample in those districts were growing rice (in Aileu none) mainly because sampled sucros were located in mountainous areas.

Table 4. Cultivation of five food crops

	Percentage of respondents cultivating this crop (number of cases)				
	Maize	Rice	Peanut	Cassava	Sweet Potato
% of farmers	99% (694)	31% (217)	35% (247)	91% (640)	76% (531)
MTS data	95%	37%	29%	86%	60%
2010 Census	88%	39%	NA	81%	NA
[672 and 702 respondents from the MTS and AS respectively answered these questions]					

Note that among the 217 rice producers interviewed, only eight produced rice in dry land ("padi gogo"). Most of them were in Oecusse. Only one farmer growing Nakroma in Manatuto said he also tried growing Nakroma on a high land because rain was very important when he planted it, but he wasn't able to get a good production.

Figure 3 classifies households according to the combination of food crops they are growing. Each segment in the figure represents a category of household growing either a single crop, or a combination of two, three, four or the five crops (the intersection in the middle of the graph). The side box summarizes the categories for all maize growers.



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 Maize (M) with Cassava (Ca), Peanut (P), Rice (R) and Sweet Potato (SP)

- 8 M
- 3 M + P
- 29 M + Ca + R
- 2 M + P + SP
- 55 M + Ca
- 248 M + Ca + SP
- 12 M + SP
- 6 M + R + P
- 30 M + Ca + P
- 125 M + Ca + P + SP
- 73 M + Ca + R + SP
- 6 M + R + SP
- 4 M + R + P + SP
- 58 M + Ca + P + R + SP
- 19 M + Ca + P + R
- 16 M + R

694 Maize growers

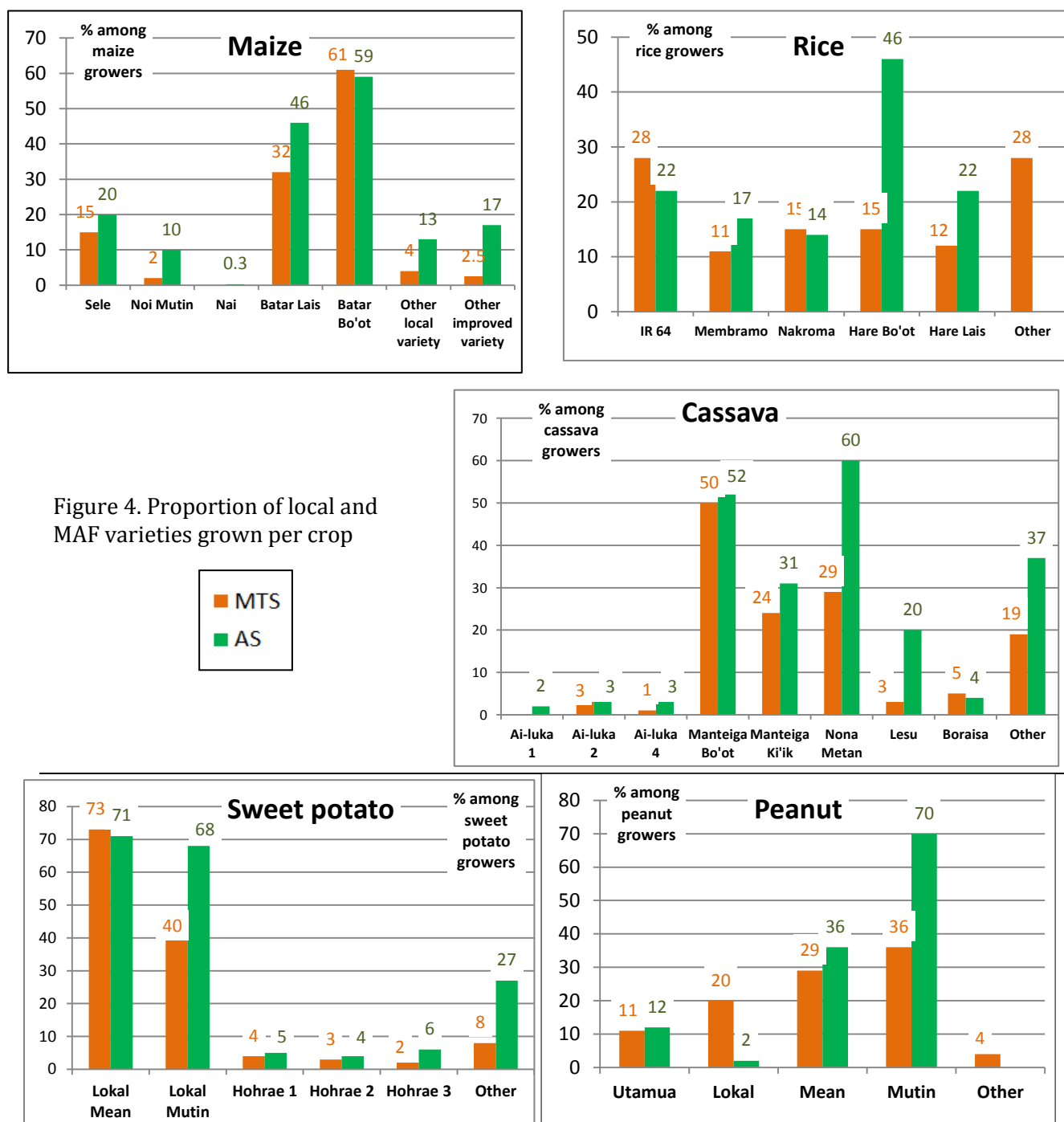
Figure 3. Cultivation of five food crops by survey sample households

Overall, it is clear that maize is the main staple crop and is most of the time combined with cassava. Again, if compared to the MTS data, what appears is that this survey has sampled less rice growers (for example, there are five “rice-only producers” here compared to 23 in 2013). Combinations of crops including sweet potatoes are also much more frequent than in the MTS (for example: 248 maize/cassava/sweet potato growers now compared to 159 2013). As mentioned earlier, that mainly results from the improved enumerators’ skills in getting more complete information from farmers.

Other categories of farmers have quite similar proportions as in the MTS sample.

2.2.2 Diversity of Varieties Grown

After identifying the crops grown by farmers, enumerators had to identify which varieties were planted. The result of this variety identification is presented in Figure 4.



Even though enumerators were thoroughly trained in variety identification, properly identifying varieties also depended on being able to see crops or the harvested products. Given that data collection was conducted in August and early September, in most cases enumerators were only able to see either a few cobs or some paddy as well as cassava and sweet potato crops if the farm wasn't too far from the location of the interview.

As there are lots of local varieties (especially for cassava and rice), less attention was paid to properly differentiating between local varieties. Therefore, the proportions of local varieties as presented in the graphs below should be interpreted carefully.

Here are some of the interesting findings extracted from the above graphs (discussion in part 2.3):

- **Maize:** In the 2014 AS, the proportion of other improved varieties (mainly Bisma) has significantly increased; much more than Sele and Noi Mutin for example. This is mainly explained by the fact that MAF distributed more than 150 tonnes of Bisma before the 2013-2014 cropping season all over the country. This definitely underlines a problem of strategy for MAF concerning the dissemination of its own varieties versus imported varieties from Indonesia, such as Bisma.
- **Rice:** The proportion of IR64 and Nakroma growers has somewhat decreased while the proportion of farmers growing Membramo has increased since 2013. The slight decrease in adoption of Nakroma will be discussed in section 2.3.2. Note that 78% of Membramo growers were met in Oecusse where most respondents were active rice producers. Also varieties that were initially in “other” were later on categorised in two groups: “hare bo’ot” which takes four to six months to harvest (most of these are local varieties) and “hare lais” which takes three to three and a half months to harvest. In the MTS a slightly different approach was taken while categorizing “other rice varieties” which resulted in very different proportions when compared to the AS. It is certainly very difficult to correctly identify those “other varieties” as there are a lot of them and farmers often use local names.
- **Cassava, sweet potato and peanut,** several inconsistencies appear in the data when compared to the 2013 results. A number of local varieties appear to be much more grown in 2014. Clearly, these sharp increases are due to different variety identification techniques used in the MTS and AS. The AS team conducted a much more in depth questioning regarding the diversity of varieties grown which apparently has resulted in a higher proportion of local varieties being identified (two to three varieties of each crop per farmer). For some varieties such as Nona Metan or Lesu (cassava), the AS enumerators were able to better identify those than 2013, because they knew in advance what were the different local names given to these two varieties. For other local varieties, it was mainly left to how the farmer would call the variety (often named after the colour of the tuber/pod). In such cases, it is very difficult to be sure that the varieties actually included in those categories are comparable to those of the MTS similar categories.

In contrast, the progressive increase in adoption of MAF varieties for cassava, sweet potato and peanut is coherent and realistic. This will be discussed in the following section.

2.3 Adoption of MAF Varieties

2.3.1 Adoption Rates Combined

Table 5 presents the adoption figures from 2011 (baseline survey) to 2014 (AS). In 2014, it is estimated that 32.5% of Timorese crop growers¹⁵ grew at least one of the 11 varieties released by MAF. Given the sampling criteria¹⁶, there is a 99% chance that the adoption rate is between 27.7% and 37.4%.

This represents an increase of 8 points compared to 2013, which is very promising. Moreover it also shows a much faster increase in adoption when compared to the progress made between the 2011 baseline and the 2013 MTS (± 3.5 points per year).

Table 5. MAF varieties adoption rates – National level

	Crop growers	MAF variety adopters	% of MAF variety adopters	% of male headed households adopters	% of female headed households adopters
AS	702	228	32.5%	31.8%	37.4%
MTS	672	165	24.6%	25.4%	14.3%
Baseline	1,510	270	17.9%	17.9%	17.2%

[Answers from 672 and 702 respondents in the MTS and AS respectively]

Adoption among female and male households was also calculated. Even though a higher proportion of female households were found to be adopters, this difference isn't significant statistically (use of chi-square test). In other words, whether the head of the household is male or female does not influence adoption.

Table 6 presents adoption figures per region. The central and eastern regions have a much higher adoption rate than the western region (39% vs. 25%). This is mainly due to very low adoption measured in the large district of Ermera: five adopters only among 92 farmers interviewed (in the MTS, 10 adopters were identified among 88 respondents). This can be explained by the fact that seed distribution in Ermera wasn't handled as well as in other districts: each SEO works in two to six sucos but many still do not have motorbikes, which limits their working capacity. Also, the western region was the one with the smallest proportion of sampled aldeias having CSPGs (31% against 32% and 54% in the East and Centre respectively). As a result, in Ermera for example, only one respondent was a CSPG member (there were about five CSPG members interviewed per district on average).

¹⁵ Crops growers here refers to farmers growing at least one of the staple crops MAF has released varieties for: maize, rice peanut, cassava and sweet potato.

¹⁶ The sample size was calculated using the following criterion: 4.85% margin of error and 99% level of confidence.

Table 6. MAF varieties adoption rates – Regional level

		Crop growers	MAF variety growers	% of crop growers
East	AS	241	95	39%
	Lautem, Viqueque, Baucau, Manatuto	MTS	74	32%
	Baseline ¹⁷	305	96	31%
Centre	AS	137	53	39%
	Manufahi, Aileu, Ainaro, Dili	MTS	34	26%
	Baseline	378	74	20%
West	AS	324	80	25%
	Covalima, Ermera, Liquiça, Oecusse, Bobonaro	MTS	57	18%
	Baseline	827	100	12%

[Answers from all 672 respondents in the MTS and 702 in the AS]

Since the 2013 survey, the levels of adoption per region have all increased. In the central region, a very important increase can be observed (+ 13 points since 2013 and +19 points since 2011). This is mainly thanks to significant distributions by MAF of seeds and cuttings in 2013-2014 in the central region: 63% of sampled sucos received seeds/cuttings from MAF versus 29% in other regions. Also IFAD has actively been distributing Sele and Noi Mutin seeds in Aileu and Manufahi. In Atauro for example, important efforts to open up this sub-district were made by distributing Sele, Noi Mutin, Utamua and Hohrae cuttings in 2013, as well as by forming 4 to 6 CSPGs in each of its sucos.



Figure 5. Adoption rate by region

¹⁷Without Viqueque and Lautem

Adoption was also compared according to the length of presence of the SoL program in the districts. As a result, districts where SoL was present longer (i.e. in 2006-2008, the early years of SoL 2) have a much higher adoption level than other districts. In SoL's earlier districts, adoption is close to the end-of-program target: 42% vs. 50% to be reached by mid-2016. If a similar increase occurs in the coming year, it is likely that the planned target will be reached.

Table 7. MAF varieties adoption rates – Program level

		Crop growers	MAF variety growers	% of crop growers
Districts of early SoL2 Baucau, Manufahi, Aileu, Liquiça	AS	210	88	42%
	MTS	202	72	36%
	Baseline	539	161	30%
SoL3 districts Other nine districts	AS	492	140	29%
	MTS	470	93	20%
	Baseline	971	109	11%

[Answers from all 672 respondents in the MTS and 702 in the AS]

The following maps illustrate this evolution.

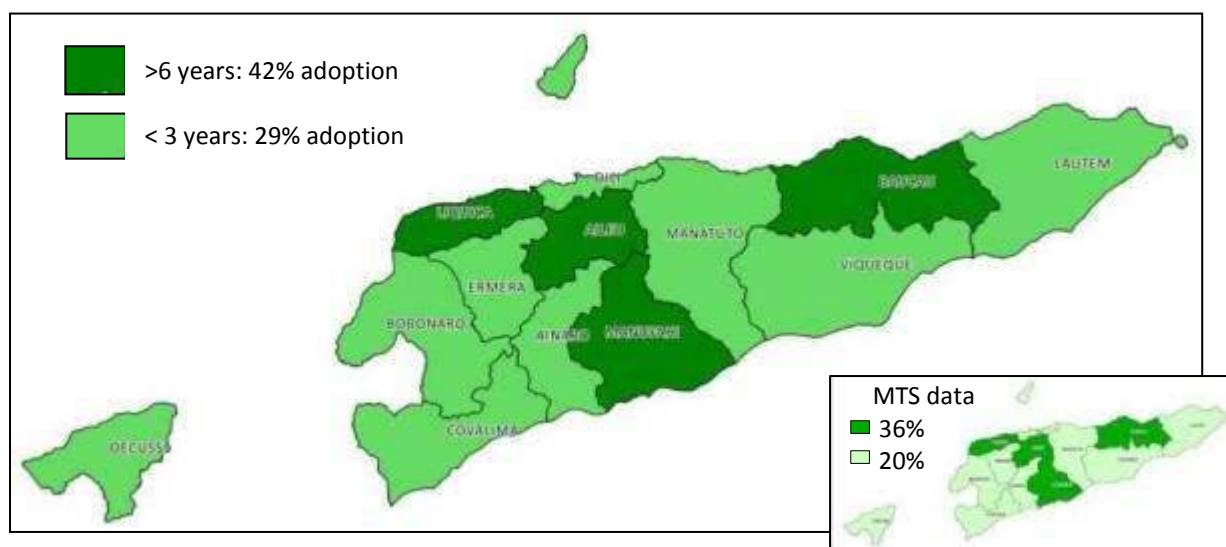


Figure 6. Distribution of adopters according to the length of presence of the program

2.3.2 Adoption Rates per Variety

Table 8. MAF varieties adoption rates (% among crop growers)

	Baseline	MTS	AS
Sele	13%	15%	20%
Noi Mutin	-	2%	10%
Nai	-	-	0.3%
Nakroma	11%	15%	14%
Utamua	16%	11%	12%
Ai-luka	3%	3%	5%
Hohrae	7%	7%	9%

[Answers from all 672 respondents in the MTS and 702 in the AS]

Sele, Noi Mutin and Nai

Among all maize growers (694), 24% are growing at least one of the three maize improved varieties released by MAF. Among all MAF varieties, those with the highest increase in adoption since 2013 are Noi Mutin followed by Sele. This is mainly thanks to important distributions from MAF and a few NGOs in 2013. It is estimated that in 2013, 24 tonnes of Sele and 5 tonnes of Noi Mutin certified seeds¹⁸ were taken out from MAF's storage rooms for MAF, NGOs and other programs to distribute to farmers across the country. According to secondary data, Sele was actually grown in about 75% of the sampled sucos and Noi Mutin in about a third of those.

During the MTS, the issue of farmers growing “contaminated Sele” was discussed as it makes identification of Sele adopters more difficult (contaminated cobs can look very similar to other varieties such as “Batar Bo’ot”). It also underlines the importance for farmers to be able to renew their maize seeds every three years on average in order to sustain the benefits of the improved variety. Thus, for this survey, enumerators were asked to indicate whether the cobs were contaminated or not; which was possible only when enumerators were able to see the cobs.

As a result, 11% of Sele growers were reported as growing “contaminated Sele” and 15% of Noi Mutin adopters were growing “contaminated Noi Mutin”. These proportions are quite low which reflects the fact that many of these adopters are first-time growers. It is also very likely that some contaminated Sele or Noi Mutin were actually recorded as “pure Sele or Noi Mutin” (especially if enumerators saw only a few cobs or none).

Lastly, Nai was grown only by two farmers who received seeds from MAF in 2013 (one in Viqueque and one in Dili). However, because this variety is very similar to Sele and Bisma, the number of farmers growing Nai might be slightly underestimated.

¹⁸ Data from Seeds of Life's Certified Seed Production Component.



Figure 7. Respondent growing “contaminated Sele cobs” (left) and “pure Sele” (right)

Nakroma

Nakroma is the only MAF variety for which there is a decrease in adoption since 2013 (15% to 14%). Yet, this difference isn’t big enough to conclude there is an actual decrease in adoption. Moreover, as mentioned earlier, a smaller proportion of rice growers were interviewed for this survey which might have impacted on the accuracy of the level of Nakroma adoption.

In Baucau, Bobonaro, Manatuto and Aileu (Timor-Leste’s “rice bowl”), only 20% of the sampled sucos received seeds from MAF in 2013 (versus 37% among all sampled sucos). As a result, 61% of Nakroma adopters received their seeds from MAF in 2013 versus 50% in 2014.

In the case of Oecusse where a lot of rice growers were met (50), only very few farmers were growing Nakroma (3). Many of these farmers said they were growing Nakroma in 2013 but decided to stop because this variety didn’t grow well when planted in very wet paddy fields, while Membramo and other local varieties were more resistant to such conditions. Enumerators also met a farmer group in Baucau that grew Nakroma in 2012-2013 but was unable to sell it because the expected buyer finally didn’t purchase the harvest. They are now growing a local variety which they can sell easily.

Utamua

Adoption of Utamua has only very slightly increased (11% to 12%) since 2013. But when compared to the baseline survey, Utamua is the only variety for which adoption seems to have decreased. Nevertheless, given that both MTS and AS data are coherent with each other, it is likely that the baseline data was actually overestimated. In fact, at the stage of the baseline, enumerators might have been confused by the fact that Utamua also means peanut in the local language Makasae and consequently might have listed more Utamua growers than actual.

Note that Utamua was reported to be grown in about 50% of the sampled sucos according to local leaders, but probably only a small proportion of the farmers in those sucos actually grow Utamua.

Ai-luka and Hohrae

Large-scale distribution of Ai-luka in early 2013 has contributed to the increase of adoption of Ai-luka since the MTS (3% to 5% of cassava growers). Note that adoption had not increased between the baseline survey and the MTS, probably because no such large-scale distributions were conducted in the past.

The same observation can be made for Hohrae. Secondary data from local leaders also revealed that about half of the sampled sucos have Ai-luka and Hohrae growers. But again probably just a small proportion of farmers in those sucos actually grow these varieties.

More specifically, Ai-luka 1, 2 and 4 have adoption rates of 1.7%, 2.5% and 2.7% respectively. Adoptions of both Ai-luka 2 and 4 have increased (0.2 points and 1.8 points increase for Ai-luka 2 and 4 respectively). For Ai-luka 1, because CCT has also distributed other cassava varieties, it was more difficult for enumerators to check if respondents sourcing cuttings from CCT were actually growing Ai-luka 1 or not.

Also Hohrae 1, 2 and 3 have adoption rates of 5.3% (3.7% in 2013), 3.6% (2.7% in 2013) and 5.8% (2% in 2013) respectively. Adoption of Hohrae 3 has significantly increased since 2013. Still, the overall low percentages of adoption of these varieties do not allow making any conclusions regarding a possible preference of farmers for Hohrae 3.

Hohrae is the only MAF variety for which the gender of the head of household seems to influence adoption (chi-square test): 49 of the 50 households growing Hohrae had a male head of household.



Figure 8. Woman farmer growing Utamua

Growing MAF Varieties and Local Varieties

Whenever farmers grew a MAF variety and a local variety of the same crop, they were asked to compare production patterns of both varieties (area, harvest, etc.). This data will be presented in the section 2.4. Table 9 presents the proportion of such farmers among adopters.

Table 9. Proportion of respondents growing MAF varieties and local varieties (% among variety adopters)

	MTS	AS
Sele	45%	58%
Noi-Mutin	7%	51%
Nai	-	100%
Nakroma	100%	16%
Utamua	11%	41%
Ai-luka	21%	82%
Hohrae	24%	50%

[Answers from all 165 and 226 adopters of the MTS and AS]

Apart from Nai which was grown by only two farmers in the sample, the variety that is the most frequently grown with local varieties is Ai-luka. Indeed, farmers often grow three to four different varieties of cassava, most of them being local ones.

Those proportions are quite different from what was found during the MTS. For example many more farmers apparently grow Ai-luka and Hohrae with other local varieties this year. As explained earlier, this is mainly because enumerators collected more complete data this year than in 2013.

On the other hand, more farmers appear to grow only Nakroma now (most of these cases are in Viqueque and Manatuto). But it is not clear if this evolution is real or if the finding actually results from enumerators using different interviewing methods compared to those of the MTS.



Figure 9. Farmer growing Nakroma in Viqueque

2.3.3 Adoption of Multiple Varieties

As shown in Figure 10, adoption of multiple varieties in 2014 seems much more frequent than in 2013. This is very encouraging as it reflects farmers' satisfaction towards MAF varieties. A higher proportion of "multiple adopters" are located in the eastern region: 14% of adopters in the East grow four varieties or more versus 6% in both central and western regions.

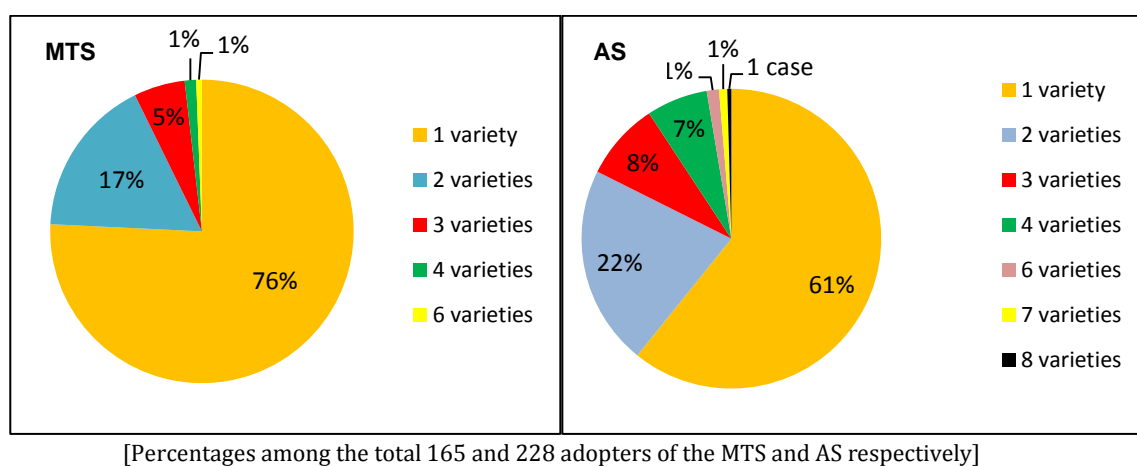


Figure 10. Percentage of farmers growing one or more MAF varieties during MTS and AS

The most common combination of varieties grown is Sele and Noi Mutin (seeds were often distributed together by IFAD when farmers were buying two drums). Also it is quite common that farmers grow all three Hohrae varieties or both Ai-luka 2 and 4 because these varieties were distributed all at once during the large-scale distributions.

A farmer met in Baucau (suco Triloca) is growing eight MAF varieties for six years already; that is Sele, Noi Mutin, Hohrae 1, 2 and 3 and Ai-luka 1, 2 and 4. She was first given improved seeds/cuttings by a family member working as an on-farm demonstration trials researcher in Seeds of Life, and she obtained Noi Mutin seeds from the research station in Triloca.

2.3.4 Factors Influencing Adoption

Factors that are influencing whether or not a household adopts a MAF variety are summarised in Table 10 (use of chi-square tests).

Table 10. Correlations between adoption and various factors

	Percentage among adopters who have answered these questions	Percentage among non-adopters who have answered these questions
Respondent lives in a suco where IFAD has distributed drums and seeds ***	26%	9%
Respondent declares there is a CSPG in his suco ***	51%	23%
Respondent lives in a suco where MAF/SoL has indeed formed a CSPG ¹⁹ *	87%	81%
Respondent lives in an aldeia where MAF/SoL has formed a CSPG ***	52%	34%
Respondent lives in a suco where the CSPGs are two or three years old**	41%	39%
Respondent declares the CSPG is selling seeds *	31%	14%
Respondent is currently a member of a CSPG ***	49%	23%
Respondent was in the past a member of a CSPG **	34%	16%
Respondent declares his family experienced a hungry season ***	74%	87%

The more powerful the correlation, the higher the number of stars.

The following points can be concluded from the above data:

- Definitely, farmers being members of CSPGs (currently or in the past) influences adoption: 49% of adopters who live in a suco where there is a CSPG are members of a CSPG (60 respondents).
- The fact that respondents are aware that there is a CSPG in their suco increases the chances that they are adopters.
- The closer the CSPG (same aldeia as the respondent), the more likely it is that farmers may adopt a MAF variety. As a result, respondents who were living in a suco where there is a CSPG and where the CSPG is in the aldeia were adopters for 42% of them. But if the CSPG was not in the aldeia of the farmer, only 26% of them were adopters.
- Farmers living in a suco where the CSPGs are two to three years old also slightly influences adoption.
- Seed distributions, and more specifically those done by IFAD together with drums, positively influenced adoption. Surprisingly, no correlation was found with distributions of MAF varieties that were organised by MAF in 2013 (for example the Hohrae and Ai-luka cuttings distributed with support from the SoL program or other distributions as reported by local leaders). However, given the low quality of data related to location of seed distributions by MAF in the country, it is difficult to make accurate analysis.

¹⁹ As it will be explained later in part 2.6.1, even though 82% of the sampled sucros actually had CSPGs, only 22% of respondents said there is a CSPG in their suco.

- As in the MTS, farmers reporting not suffering from hunger are more likely to be adopters, which is very encouraging.

Reasons for wanting to grow a MAF Variety

As part of the survey, adopters were also asked: “Why did you want to grow this MAF variety?” According to the data collected through this question, it is clear that the free distributions of seeds/cuttings are a key determinant of adoption.

Table 11. Reasons for wanting to grow MAF varieties (% among variety adopters only)

	Received seed for free	Saw other farmers growing it	Heard about it from other farmers	Heard about it on radio or TV	Was recommended by the SEO	Other reason	I don't know
Sele	66%	18%	17%	1%	11%	32%	1%
Noi-Mutin	73%	17%	10%	0%	16%	30%	1%
Nakroma	45%	42%	13%	0%	6%	39%	3%
Utamua	45%	21%	7%	0%	14%	45%	3%
Ai-luka	76%	12%	15%	3%	15%	12%	0%
Hohrae	55%	20%	10%	0%	12%	29%	6%

[Percentages among 140 Sele and Noi Mutin growers, 31 Nakroma growers, 29 Utamua growers, 33 Ai-luka growers and 50 Hohrae growers]

For all varieties, the most common reason for wanting to grow a MAF variety is because farmers received seeds for free.

Adoption after having seen another farmer grow a MAF variety isn't frequent (10-15% of the cases) except for Nakroma where nearly half of adopters decided to grow this variety after having seen another farmer growing it (those farmers were in Baucau, Viqueque and Manatuto where a lot of farmers grow rice). Thirdly, deciding to grow a MAF variety because another farmer or the SEO has recommended it applies for only about 10-15% of the adopters.

In general, these results highlight how farmers are still very much passive when looking for the varieties of seeds or cuttings to grow.

Satisfaction with the First MAF Variety grown

Lastly, improved variety adopters who have started growing MAF varieties at different times (45 cases only) were asked if their decision to grow their next MAF variety was influenced by being satisfied with the first one they grew. 89% of them (40 cases among 45) said yes, their decision to grow another variety was influenced by the fact that they already had a positive experience growing a MAF variety.

2.4 Characteristics of Adopters

2.4.1 Source of MAF Released Seeds

Main Sources

Table 12 summarizes the source of seeds or cuttings of MAF varieties as reported by adopters.

Table 12. Sources of seed/cutting

% of respondents mentioning source of	Sele		Noi-Mutin		Nai	Nakroma	
Source of seed	MTS	AS	MTS	AS	AS	MTS	AS
Given for free by an NGO	15%	26%	14%	28%	100%	18%	13%
Given for free by the Government	52%	43%	44%	52%		61%	50%
Given for free by CSPG	NA	1%	NA	2%		NA	3%
Own seed, saved from a previous harvest	15%	23%	14%	12%		5%	30%
Bought in market	10%	6%	14%	2%		NA	
Bought from CSPG	NA	1%	NA				
From a relative / neighbour / friend (bought or free)	7%	5%	14%	14%		13%	7%
Other	1%	1%		2%		3%	17%

% of respondents mentioning source of	Utamua		Ai-luka		Hohrae	
Source of seed	MTS	AS	MTS	AS	MTS	AS
Given for free by an NGO	18%	14%	7%	12%		28%
Given for free by the Government	41%	34%	60%	27%	59%	32%
Given for free by CSPG	NA	7%	NA	3%	NA	
Own seed, saved from a previous harvest	32%	17%	7%	18%	15%	28%
Bought in market	9%	24%			4%	4%
Bought from CSPG	NA		NA		NA	
From a relative / neighbour / friend (bought or free)		14%	13%	12%	22%	22%
Given by CCT	NA	NA	NA	30%	NA	
Other		3%	13%	3%		4%

[140, 68, 2, 30, 29, 33 and 50 farmers planting Sele, Noi Mutin, Nai, Nakroma, Utamua, Ai-luka and Hohrae answered this question in the AS]

Overall, most seeds or cuttings were sourced from MAF's distributions. Other common sources of seeds/cuttings are NGOs and farmer's own stock, saved from their previous harvest.

Interestingly, Hohrae is the variety for which the proportion of respondents sourcing cuttings from another farmer is the highest. As a result, about 50% of the farmers are able to propagate Hohrae either by getting cuttings from others or from their previous crops. This supports what was also highlighted in the MTS, which is that farmers very much appreciate Hohrae and its dissemination can happen without much intervention from MAF or NGOs.

Only very few cases were found of farmers sourcing MAF released seeds from CSPGs (three cases for Sele and one case for Noi Mutin, Nakroma, Utamua and Ai-luka 4). All

but one of these cases were seeds/cuttings received for free because these farmers are members of CSPGs. Only one farmer who isn't a CSPG member said he bought Sele seeds from the Commercial Seed Producer in Fahilebo (Liquiça).

Most CSPG members interviewed said they received seeds from MAF or NGOs (probably meaning that the CSPG received seeds from MAF or NGOs).

From this data, it seems very clear that diffusion outside the CSPGs has happened only on a very limited scale; especially that 55% of the sampled sucos with CSPGs had their CSPGs created only in 2013 or 2014.

Yet, it is important to mention that more "indirect diffusion" from CSPGs may have happened but couldn't be identified in this survey, especially when farmers said they sourced seeds from another farmer or from the market but do not actually know where this other farmer for example got the seeds from (it could be a CSPG member).



Figure 11. Respondent met in Viqueque having received Sele seeds from IFAD together with the drum he bought

As expected, farmers who are growing "contaminated Sele or Noi Mutin" are mainly farmers who planted stored seeds from their previous harvest. A number of "contaminated Sele or Noi Mutin" farmers also said their seeds came from government or NGO distributions but the quantity they received was so little that they decided to mix the seeds with local variety seeds before planting it.

Evolution since the Mid-Term Survey

When compared to the MTS, one can see that the proportions of seeds or cuttings sourced from the government have decreased, except for Noi Mutin, and that farmers rely more on a self-produced seeds than on seed distributions, as was common in the past.

It is also very encouraging to see that more farmers are using their own stock of MAF released seeds/cuttings (farmers' previous harvests). For Nakroma, the proportion of those farmers has increased from 5% to 30%. The proportion of such farmers also increased for Ai-luka and Hohrae, which is probably because they are perennial crops. For Sele and Noi Mutin, several farmers mentioned that seeds were easily attacked by weevils and consequently they weren't able to store it long enough to reach the next cropping season.

Finally, Utamua, as with other peanut varieties, was quite often sourced from the market in the AS. Actually, harvested peanuts are often consumed in a few months and some farmers prefer to simply buy peanut pods in the market to plant for the next growing season rather than having to store seeds until the next planting season.

Comparison with Source of Non-MAF Varieties

Obviously, the first source of seeds or cuttings by far for these other varieties is the farmer's own stock (80-90% of the sources mentioned). For cassava and sweet potato, many farmers also mentioned simply leaving the previous year's crops in the ground and continued harvesting those.

A smaller proportion of farmers also got seeds or cuttings from relatives or neighbours (in general less than 10% of the sources for each variety).

Other improved varieties as IR64 (rice) or Bisma (maize) were sourced directly from the government or NGOs, as for MAF varieties. As mentioned earlier, over 150 tonnes of Bisma, and perhaps as much as 200 tonnes, were distributed in 2013-2014.

For the same reason as mentioned above and in the MTS, varieties that are sometimes sourced from the market are peanut varieties, followed by maize and sweet potato varieties. Finally, buying from other farmers is very rare which might explain why buying MAF released seeds or cuttings from a CSPG was found only once.

Multiplier Effect: Seed/Cutting Exchanges between Farmers

The same situation as in the MTS occurred during this survey: many more farmers mentioned having shared planting material with other farmers (48%) than the proportion of farmers saying they sourced seeds/cuttings from another farmer (15%). One possible explanation could be that each receiving farmer received seeds / cuttings from three different sharing farmers. In reality, probably fewer farmers give away seeds or cuttings but wouldn't admit it in front of the enumerator; and probably more adopters sourced their seeds from other farmers but they weren't spotted in this survey.

As a result, one can approximate the multiplier effect to be between 1.2 and 1.4.

2.4.2 Production Patterns

Area grown of MAF Varieties

Table 13 summarizes data on areas grown under MAF varieties in 2013 and 2014. Areas were estimated by enumerators by looking directly at the plot whenever it was accessible or, if it was too far, by asking the farmer to point out the length and width of the plot (same technique as for the MTS). Also, during the MTS, spot-checks were conducted to verify the precision of these estimations. As the result of these spot-checks were very positive (on average estimations are only 7% bigger than the actual plot size), it was assumed for this 2014 survey that these estimations would be accurate enough.

Finally, note that for farmers growing two cycles of MAF varieties²⁰, areas of both cycles have been added up.

Table 13. Area grown with MAF varieties

% among total variety adopters and areas per variety adopters											
		Average number of plants	< 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	>2ha	Average area under MAF variety (ha)	Maximum area under MAF variety (ha)
Sele	MTS		36%	24%	19%	2%	10%	5%	4%	0.5	2
	AS		69%	19%	6%	1%	3%	1%	1%	0.3	4
Noi-Mutin	MTS		21%	29%		7%	29%		14%	0.8	2.66
	AS		62%	22%	7%	3%	1%	4%		0.3	1.75
Nakroma	MTS		19%	22%	19%	3%	27%	3%	8%	0.8	4
	AS		39%	32%	13%	3%	7%	3%	3%	0.4	2.16
Utamua	MTS		68%	5%	16%	5%		5%		0.3	1.6
	AS		97%			3%				0.1	0.86
Ai-luka	MTS		31%	36%	14%		14%		14%	0.6	2
	AS	19	79%	14%	7%					0.2	0.72
Hohrae	MTS		54%	23%	15%		4%		4%	0.3	2
	AS	30	85%	10%	3%	3%				0.1	0.86

[140, 69, 31, 29, 33 and 50 farmers planting Sele, Noi Mutin, Nakroma, Utamua, Ai-luka and Hohrae answered this question]

On average, the MAF varieties are usually grown on areas of less than half a hectare: 0.4 ha for Nakroma, 0.3 ha for Sele and Noi Mutin, 0.2 ha for Ai-luka and 0.1 ha for Utamua and Hohrae. Indeed, Utamua, Ai-luka and Hohrae are sometimes grown on a few square meters only next to the house if farmers had only few cuttings or seeds to plant. Some of these very small parcels were actually used as trials, under supervision of the SEO.

Clearly, for all the varieties, production areas have reduced since 2013. This could be partly explained by the fact that the AS enumerators were more skilled in spotting out even small areas of MAF varieties. Some farmers for example are growing only a few scattered plants of Hohrae or Ai-luka. In those cases, the number of plants was just counted instead of measuring the area grown (that was the case for eight Ai-luka

²⁰ That was the case of 13% of Sele, 17% of Noi Mutin, 3% of Utamua and 14% of Hohrae growers.

farmers who grew on average 19 plants, and 12 Hohrae farmers growing on average 30 plants).

Regarding the areas of the different Ai-luka and Hohrae varieties

- Farmers who are growing more than one Ai-luka variety (eight cases) often grow more Ai-luka 4. Ai-luka 1 is the variety grown on the smallest areas.
- Farmers who are growing more than one Hohrae variety (17 cases) mostly grow a similar area of each variety.

Area of MAF Varieties versus Area of Local Varieties

As presented in Table 14, among adopters who are growing at least one local variety (of the same crop), most are growing equal areas of both types. A significant proportion of Ai-luka and Hohrae growers declared they grow more of the MAF variety than of the local variety which could mean that farmers appreciate those varieties. For Utamua, it is the other way around: a higher proportion of farmers grow more of the local variety than of Utamua which might suggest farmers are still very keen on growing their local peanut varieties.

Table 14. Comparison of areas of MAF varieties and local varieties

Varieties	Proportion of variety adopters also growing at least one local variety	MAF var. < local	MAF var. = local	MAF var. > local
Sele	58%	28%	39%	33%
Noi-Mutin	51%	29%	31%	37%
Nakroma	16%	14%	71%	14%
Utamua	41%	25%	67%	8%
Ai-luka	82%	7%	52%	41%
Hohrae	50%	12%	52%	36%

[82, 35, 7, 12, 27 and 25 variety adopters answered this question]



Figure 12. Respondent in his farm where he grows Ai-luka 4

Cropping System

As shown in Table 15, most of the MAF varieties are grown by intercropping with other varieties. But Utamua (as other peanut varieties) is often grown on a separate smaller parcel. Farmers growing MAF varieties by intercropping were asked to specify if they were more or less grouping the different crops into rows or smaller parcels (“row intercropping”) or just scattered (“mixed intercropping”). As a result, Ai-luka and Hohrae are often planted all over the plot in a scattered manner while Sele and Noi Mutin are planted in rows or in a smaller parcel of the plot. Note that this type of cropping system is quite similar to how farmers grow local varieties.

Table 15. Cropping system used for MAF varieties

Varieties	Monocropping	Row intercropping	Mixed intercropping	Growing on the same plot as another variety
Sele	18%	48%	34%	89%
Noi-Mutin	15%	58%	27%	71%
Utamua	34%	66%		41%
Ai-luka	6%	48%	45%	85%
Hohrae	19%	46%	40%	59%

[140, 69, 31, 29, 33 and 48 variety adopters answered this question]

More interestingly, 89% of the farmers mentioned they were growing Sele on the same plot as a local variety. For Noi Mutin, 71% of farmers said they were growing Noi Mutin on the same plot as any other variety (most probably a local variety). These proportions are very important and lead us to believe that in one or two cropping seasons, farmers seeds will be completely contaminated by local varieties. Several farmers complained that they had no choice but to plant Sele or Noi Mutin seeds together with local varieties because they received only small quantities of seeds or because at the time they received the seeds from MAF, it was late in the planting season and they had no more free plots to plant the new variety on its own.

Linked to this issue, another question was asked to farmers growing MAF released maize varieties: “Do you know that you need to change your seeds every three years with good seeds?”. Interestingly, ALL the farmers who answered this question (98 farmers) said they didn’t know. Clearly, there is a need for more awareness regarding how to sustain the properties of improved maize varieties.

Harvest

Table 16 summarizes the data collected regarding harvests of the MAF varieties. No quantitative data was collected regarding quantities harvested as it is very difficult to collect accurate quantitative data from farmers.

The very large majority of adopters harvested their crops successfully. Varieties for which harvests were the most often lost are Ai-luka followed by Hohrae (six and seven cases). When compared to the quantity of local varieties harvested, it appears that farmers usually harvest more of the MAF variety than of the local variety.

Table 16. Harvest of MAF varieties

Varieties	Harvested	Not yet harvested	Harvest was lost	MAF var. < local	MAF var. = local	MAF var. > local
Sele	88%	3%	9%	32%	22%	46%
Noi-Mutin	93%	3%	4%	39%	21%	40%
Nakroma	84%	10%	6%	14%	29%	57%
Utamua	90%		10%	20%	30%	50%
Ai-luka	49%	33%	18%	15%	39%	46%
Hohrae	45%	41%	14%	22%	56%	22%

[81, 12, 21, 18, 4 and 8 variety adopters answered this question]

Generally, most farmers (42% of the cases) gave consistent answers with when they were asked about the area under MAF varieties compared to local varieties (Table 14). For example, when the area of Sele is larger than the area under Batar Bo'ot, the harvest of Sele is also bigger than the harvest of Batar Bo'ot. Also, there are slightly more farmers saying they harvested more Sele than Batar Bo'ot for example even though the area under Batar Bo'ot was bigger (32% of the cases) compared to the number of farmers who mentioned a smaller harvest for a bigger area of the MAF variety (26% of the cases).

We can therefore conclude that in general, productivity of the MAF varieties are perceived to be higher than those of the local varieties.



Figure 13. Farmer coming back from his farm with a few of stems of Hohrae 2 to show to the enumerator

2.4.3 Duration of Adoption

Duration of Adoption of MAF Varieties

In this survey, adopters were also asked if they were growing the MAF varieties in the past (i.e. before August 2013) and for how long. Table 17 summarizes those results. Unfortunately, such questions were not asked in the MTS, making comparisons impossible.

Table 17. Duration of adoption of MAF varieties

Varieties	Grown before this year ²¹	Average duration of adoption ²²	Maximum duration	Category of duration of adoption		
				2 years ²³	3-4 years	5 years +
Sele	42%	3 years	7 years	48%	38%	14%
Noi-Mutin	20%	2.7 years ²⁴	6 years	64%	29%	7%
Nakroma	52%	2.9 years	7 years	50%	38%	12%
Utamua	48%	3 years	7 years	43%	43%	14%
Ai-luka	27%	3 years	6 years	45%	44%	11%
Hohrae	49%	3.2 years	7 years	42%	46%	12%

[69, 23, 16, 14, 11 and 28 farmers planting Sele, Noi Mutin, Nakroma, Utamua, Ai-luka and Hohrae said they grew those varieties before this year and answered the following questions]

The first observation is that Sele, Nakroma, Utamua and Hohrae are varieties that are often grown for more than a year (about 50% of variety adopters). Noi Mutin, which was the latest maize variety released (in 2012), has been grown more than a year by only 20% of adopters, and among these, most said they grew Noi Mutin for two years only.

Among farmers that have grown these MAF varieties for more than a year, the average duration of adoption is three years. Hohrae is the variety that is grown the longest time (3.2 years on average – 7 years maximum). That might be because it is a perennial crop (same as cassava) but also because it is slightly more appreciated than other MAF varieties.

Also, note that even though several farmers complained about Sele or Noi Mutin being more sensitive to weevils than local varieties (and consequently, more difficult to store seeds until the next harvest), about 38% and 29% of these variety adopters are able to continue growing these during three to four years.

²¹ “This year” here means August 2013 – July 2014 (data was collected in August 2014).

²² The average duration was calculated among adopters who grow at the variety at least two years.

²³ Two years includes the year August 2013 – July 2014.

²⁴ This duration was calculated among 14 cases for which an answer was available. Five farmers said that they have grown Noi Mutin for more than two years, which is longer than the time this variety has been released. These five farmers are all multiple MAF variety adopters, and are most probably farmers who got access to MAF varieties through “non-formal distribution channels” - i.e. directly from research stations, or through OFDTs.

Adopters who were growing a MAF variety for more than a year were asked if they grew a bigger or a smaller area in the past compared to now (Table 18). Only very few cases of adopters reducing the size of the area grown under a MAF variety were reported (nine Sele, one Utamua and two Hohrae growers). Varieties that farmers have expanded most since 2013 are: Ai-luka, Nakroma and Hohrae. Again, this highlights the fact that most farmers appreciate those varieties. Only very few farmers have expanded the area under Utamua since the first time they have grown it.

Table 18. Area grown in the past and now

Varieties	Less now	Same as before	More now
Sele	13%	65%	22%
Noi-Mutin		74%	26%
Nakroma		62%	38%
Utamua	7%	86%	7%
Ai-luka		60%	40%
Hohrae	7%	56%	37%

[69, 23, 16, 15, 10 and 27 farmers planting Sele, Noi Mutin, Nakroma, Utamua, Ai-luka and Hohrae answered this question]



Figure 14. This respondent in Manatuto received both Sele and Noi Mutin seeds from IFAD because he purchased two drums.

Growing a Local Variety in the Past

Long-term adopters (more than two years) were asked if they also grew a local variety in the past. A large majority of these said yes, especially for cassava. Note that most of the adopters who are growing a local variety now were already growing it in the past

Table 19. Comparison of areas of MAF varieties and local varieties in the past

Varieties	Proportion of variety adopters also growing at least 1 local variety in the past	MAF var. < local	MAF var. = local	MAF var. > local
Sele	73%	12%	53%	35%
Noi-Mutin	83%	16%	52%	32%
Nakroma	81%	39%	46%	15%
Utamua	67%	40%	60%	
Ai-luka	91%		50%	50%
Hohrae	75%	24%	48%	28%

[70, 23, 16, 15, 11 and 28 variety adopters answered the first question related to farmers growing a local variety in the past or not.]

In terms of area grown, the local variety was often grown on similar areas as the MAF variety (still the case now). For Ai-luka, 50% of these farmers were growing more of Ai-luka than of the local variety (still the case now for 40% of farmers). Whereas for Utamua and Nakroma, about 40% of the farmers planted larger areas of local varieties. Interestingly, today these proportions have slightly reduced: more farmers grow as much area of MAF released as of local varieties or even larger areas for Utamua.

When looking only at long term adopters²⁵ who have always grown local varieties (77 cases, including 35 Sele adopters), it seems that most of them haven't changed their behaviour: if a farmer was growing less Hohrae than a local variety, he would still be doing so now. However, for Sele, 26% of these farmers have switched: they were growing a similar area before but now grow more of the local variety. Only 4% of them grow a bigger proportion of Sele now.

In conclusion, growing a MAF variety for a long time doesn't lead to abandoning the production of local varieties.

MAF Varieties grown First

Multiple adopters were asked which among the MAF varieties they grow today they started growing first. Surprisingly, 48% of the 84 farmers who answered this question said they actually started growing them all at once (most of the time because they got these at the same time from MAF or an NGO).

Most of the other farmers usually were growing Sele in the first place, sometimes together with Noi Mutin (8 cases among 44). Indeed, Sele was the first variety released by MAF.

²⁵ Long-term adopters have been growing a MAF variety for at least two years.

2.4.4 Plan for the Future

As shown in Table 20, a very large majority of the farmers said they wanted to continue growing the MAF variety in the next cropping season (similar to the MTS data). The very few farmers who won't grow the MAF variety anymore said they had no more seeds to grow. Only one farmer complained about Noi Mutin not being adapted to local soil and weather conditions and therefore not producing as much as it could. About 10% of adopters also said they didn't know what they would do during the next cropping season.

Table 20. Farmers willing to grow again the MAF varieties in the future

	MTS % among variety adopters giving an answer	AS % among variety adopters giving an answer
Sele	98%	99%
Noi-Mutin	100%	98%
Nakroma	97%	97%
Utamua	92%	96%
Ai-luka	92%	100%
Hohrae	95%	100%

[131, 64, 30, 25, 30 and 43 farmers planting Sele, Noi Mutin, Nakroma, Utamua, Ai-luka and Hohrae answered this question]

For farmers who are growing more than one type of Ai-luka or Hohrae, a very large majority of farmers said they will continue to grow all of them. Only one farmer said he would rather replant Hohrae 3 only and drop Hohrae 1. And another farmer said he would rather keep on growing Ai-luka 2 and stop with Ai-luka 1.

Now, the following table presents how much area the farmer is planning to grow next year compared to the area grown in 2013-2014. Overall, most farmers plan to grow a similar area than this year. The main differences with the MTS is that less Noi Mutin farmers said they wanted to increase the area grown while much more Ai-luka farmers want to increase the area grown. The recent data seems more coherent and realistic (also because data was collected on a larger group of farmers).

Table 21. Area of MAF variety planned to be grown

	Will grow a smaller area		Will grow a similar area		Will grow a larger area	
	MTS	AS	MTS	AS	MTS	AS
Sele	3%	2%	60%	65%	37%	33%
Noi-Mutin	-	2%	36%	68%	64%	30%
Nakroma	-		69%	74%	31%	26%
Utamua	17%		58%	68%	25%	32%
Ai-luka	9%		82%	52%	9%	48%
Hohrae	-		45%	58%	55%	42%

[123, 54, 27, 22, 29 and 38 farmers planting Sele, Noi Mutin, Nakroma, Utamua, Ai-luka and Hohrae answered this question]

Then, farmers were asked if they wanted to continue growing a local variety in the future (Table 22). Apart from Nakroma that wasn't often grown with a local variety this year, more than 50% of variety adopters said they would also plant a local variety in the future. These proportions are often bigger than for the MTS but again, the recent data was calculated on a larger group of farmers which probably contributes to providing more realistic data.

On the other hand, this data also means that a quite important proportion of these farmers (a bit less than 50% of them) are planning to completely drop local varieties in order to grow only the MAF varieties. Those farmers are probably very satisfied with the MAF varieties.

Table 22. Planting again a local variety

		Plan to plant another variety		Area of MAF variety compared to area of local variety (% among valid answers)			Reason for wanting to plant another variety as well? (number of farmers)			
		% among valid answers	# of cases	Sol =Other	Sol <other	Sol >other	Post-harvest losses	Taste	Insufficient seeds	Other
Sele	MTS	43%	33	49%	15%	36%	6	10	4	13
	AS	68%	88	60%	31%	9%	66	44	2	20
Noi-Mutin	MTS	55%	6	67%	17%	17%	2	3		1
	AS	68%	88	57%	33%	10%	66	44	2	20
Nakroma	MTS	41%	12	42%	33%	25%		4	1	6
	AS	41%	11	75%	25%		3	4	0	7
Utamua	MTS	58%	7	57%	14%	29%	3	3		1
	AS	55%	11	70%	20%	10%	4	6	0	3
Ai-luka	MTS	55%	6	67%	17%	17%	2	2		1
	AS	79%	29	62%	38%		13	16	1	6
Hohrae	MTS	38%	8		38%	62%	3	2		3
	AS	60%	26	56%	32%	12%	15	19	0	8

[33, 6, 12, 7, 6 and 6 farmers planting Sele, Noi Mutin, Nakroma, Utamua, Ai-luka and Hohrae answered yes to the first question and then answered the following questions]

Most of Sele, Noi Mutin, Ai-luka, and Hohrae growers said they would still grow a local variety because the MAF variety can't be stored as long as the local varieties. Truly, Sele and Noi Mutin are more sensitive to weevils, while Ai-luka and Hohrae get spoiled sooner after they have been harvested. Farmers also mentioned taste as a reason for keeping on growing a local variety.

Among farmers who are still planning to grow a local variety, most are planning to maintain the proportion of area grown under MAF released and under local varieties. Compared to the MTS, only few farmers plan to grow more of the MAF variety than of the local one (a higher proportion is planning to grow a larger area of local variety than of the MAF variety). Actually for Nakroma and Ai-luka, none of the farmers plan to grow more of these varieties than of the local one.

In conclusion, even though the very large majority of farmers appreciate the MAF varieties, more than half of the adopters are still very attached to their local varieties.

2.5 Familiarity with MAF Varieties

2.5.1 Knowledge about MAF-released Improved Varieties

In this section of the questionnaire, farmers were first asked: “Do you know that MAF has released improved varieties for several crops?”. 25% of respondents (173 cases) answered “yes”.

Farmers saying “yes” were then asked “For which crops did MAF release improved varieties?”. To which a very large majority answered “maize” (93%).

Maize was followed by cassava (42%), rice (41%), sweet-potato (36%) and peanut (33%). Seven farmers also thought MAF had released improved varieties for other crops like banana, taro, orange or mung bean (actually correct for this latter crop).

In conclusion, the fact that MAF has released improved varieties isn’t that well-known. And when it is known, maize is the first crop that comes to farmer’s minds.

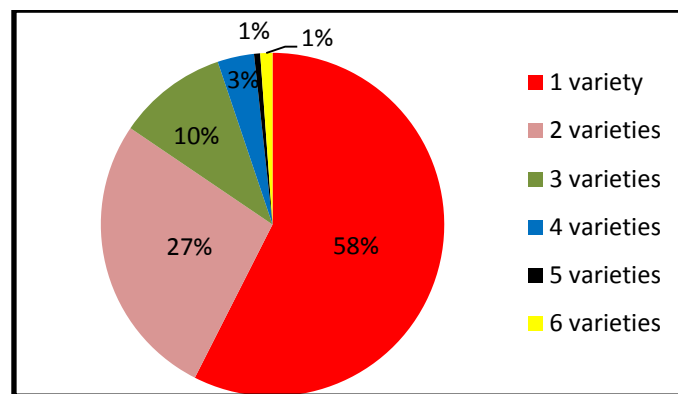
2.5.2 Familiarity with Each Variety

As in the MTS, for each MAF variety, farmers who were not growing it were asked if they had already heard about it. Note that only maize growers were questioned about MAF released maize varieties for example.

Overall, 25% of the respondents heard of at least one MAF variety. Surprisingly, this is significantly lower than in the MTS where 53% of the respondents had heard of at least one MAF variety.

This is most probably a matter of different interviewing techniques used in the MTS and in the AS. In this survey, the way the question was asked was more objective than in the MTS where enumerators might have unintentionally guided farmers in answering “Yes, I have heard about Sele” for example. Actually, in the AS, enumerators were very clearly instructed not to mention which crop each variety was (mainly because the following question in this survey was assessing farmers’ knowledge about that). That wasn’t the case in the MTS: enumerators might have mentioned that Sele is a maize variety or could have shown earlier in the interview some pictures of Sele cobs for example.

Figure 15 shows that among the 25% of respondents who were familiar with at least one MAF variety, most had heard only about one variety.



[Percentages among 174 farmers who are familiar with at least one MAF variety]

Figure 15. Number of MAF varieties farmers are familiar with.

As shown in Table 23, among the different MAF varieties, Nakroma is the most well-known (32% of respondents) followed by Sele (15%), Noi Mutin (13%) and Utamua (10%). In 2013, Sele was the most recognised variety followed by Nakroma. To ensure farmers really knew what those varieties were, the following question was specifically asking to people who said they were familiar with a MAF variety if they knew which crop it was. All farmers answered correctly (only four farmers weren't sure).

For the same reasons as mentioned earlier, familiarity with each MAF variety appears to have significantly decreased since 2013.

Table 23. Familiarity with each MAF variety
(% are calculated among crop growers who aren't growing the improved variety)

	MTS	AS
Sele	37%	15%
Noi-Mutin	18%	13%
Nai	-	0.1%
Nakroma	48%	32%
Utamua	29%	10%
Ai-luka	13%	5%
Hohrae	15%	3%

[553, 626, 693, 187, 218, 606 and 481 crop growers who do not grow respectively Sele, Noi Mutin, Nai, Nakroma, Utamua, Ai-luka or Hohrae, answered this question]

Farmers who heard of at least one MAF variety were asked from where they heard of it (Table 24). The most common source of information mentioned is MAF staff (mainly SEOs) followed by relatives and media such as TV/radio. Interestingly, brochures and calendars distributed by Seeds of Life were also a source of information for 11% of these farmers. One person also said he read about SoL varieties through the Lafaek magazine.

Proportionally, there aren't many differences between the MTS and AS data.

Table 24. Source of information

MAF	43%
Relative/neighbour	25%
Media (TV, radio)	19%
NGO	17%
Chefe suco/aldeia	15%
Brochure/calendar	11%
Other	2%

[175 farmers who heard of at least 1 variety answered this question]

Note that 78% of the total sampled farmers mentioned they or another family member owned a hand phone; this could be used as a new way for Seeds of Life to disseminate information to farmers.

Finally, farmers were asked why they didn't grow this variety²⁶. As for the MTS, the first reason for not growing a MAF variety was the fact that they do not have seeds or cuttings to plant (about 80% of farmers). This definitely highlights the importance of increasing access to seeds. Other reasons for not growing a MAF variety was that farmers were waiting to receive seeds for free (about 9% of the answers), or they stopped growing it (about 7%). A number of farmers also said they were members of CSPGs but were multiplying seeds in the group so had not yet been able to produce those varieties themselves.

Note that 64% of the farmers confirmed they would be ready to pay for improved maize seeds at a price of 1.5\$/kg if it was available for sale. 22% said they weren't sure and only 16% said no. In general, this information is very encouraging vis-à-vis possible marketing of the seeds by CSPGs or CSPs. In the MTS, the wording of this question was more general (not specifically for maize varieties only and not mentioning a price) and the result was that more than 80% of farmers declared they would be ready to pay.

2.5.3 Factors influencing Familiarity with MAF Varieties

Region

Within the districts where the program was first implemented, farmers are more familiar with MAF varieties: 31% are familiar with at least one MAF variety versus 22% in other districts.

Also, it is in the eastern region that farmers are the most familiar with MAF varieties (32% of farmers) followed by the central region (25%) and finally western region (19%). Note that this distribution reflects the distribution of adopters in those regions.

²⁶ Note that this question was asked only if the farmer had heard about the variety, was able to identify which crop it was and was already growing the crop.

Community Seed Production Groups

Of course, being a member of a CSPG increases the chances that the farmer is familiar with at least one of the MAF varieties that he isn't growing yet: 57% of farmers-members of a CSPG were familiar with at least one MAF released variety vs. 32% among farmers who aren't part of a CSPG. Still, it seems that more awareness could be raised among CSPG members about the existence of other MAF varieties besides those that the group grows already.

Also, being aware of the existence of a CSPG in the suco very much influences the fact that a farmer is familiar with MAF varieties: 42% of the farmers who said there is a CSPG in their suco are familiar with at least one MAF variety against 21% for farmers who said there isn't any CSPG in their suco.

2.6 Participation in Community Seed Production Groups

2.6.1 CSPGs in Sampled Sucos

To assess how familiar farmers are with CSPGs, farmers were asked if they knew about the existence of such a group in their sucos. In total, 22% of the farmers said yes, 46% said no and 31% said they didn't know. In reality, 82% of the sampled sucos had CSPGs, which shows that for now, most farmers aren't aware of the existence of a CSPG in their village.

Among the farmers who confirmed there is a CSPG in their suco, 90% of them were right, which is very encouraging (it was 49% in the MTS). But among those who said "no, there isn't any CSPG in my suco", 75% were actually living in a suco where there is a CSPG. For some sucos, this may be linked to the fact that the CSPG has only been established for about a year, and has not yet started to share seeds or cuttings beyond its members. Still a lot of awareness raising is needed to inform farmers about CSPGs and consequently increase chances that MAF varieties will be spread from CSPG members to other farmers.

Also, the closer the farmer lives to the CSPG, the more chances he will be aware of its existence: 39% of respondents living in an aldeia with a CSPG said there is a CSPG in their suco against 14% of respondents living in a suco with a CSPG but where the CSPG is in another aldeia. Hence, it seems crucial to create bridges / links between aldeias where there are no CSPGs and aldeias where there are CSPGs.

Among the 159 respondents who confirmed there is a CSPG in their suco, 30 of them said the CSPG was also selling out seeds: 25 farmers mentioned Sele, 12 Noi Mutin, 9 Utamua, 4 Ai-luka and finally 3 said the group is selling Hohrae cuttings.

2.6.2 Respondents who are Members of CSPGs

Respondents who confirmed there is a CSPG in their suco were asked if they were a member of it now as well as in the past:

- **In the past:** 26% of the farmers who said there is a CSPG in their suco (i.e. 41 farmers) said they were a member of it in the past but eight among them said they weren't anymore members of these groups mainly because the group stopped functioning.
- **Current members:** 38% of the farmers who said there is a CSPG in their suco said they were a member of it, which represents 9% of the total sample. This is quite similar to the proportion of respondents who were member of a seed production group in the MTS sample (14% but including not only MAF/SoL seed production groups). Among these farmers, 52% (that is 31 cases) said they were also a member of a CSPG in the past.



Figure 16. CSPG growing Hohrae in Oecusse

2.6.3 Length of Membership in a CSPG and Adoption

Table 25 presents the length of membership in those CSPGs and how many of these respondents were also adopters.

Table 25. Length of membership in a CSPG and adoption

Length of membership	% of farmers (number of cases)	% of adopters within each category
1 year	48% (29)	66%
2 years	25% (15)	67%
3 years	12% (7)	86%
4 years or more	15% (9)	100%

[60 farmers currently members of a CSPG answered these questions]

Most of the respondents have only recently joined a CSPG and consequently are still in the phase of multiplying MAF varieties in their groups. When those groups will have succeeded in multiplying seeds, the harvested and selected seeds will be distributed for farmers to plant on their own farms.

Still, 66% of these one-year CSPG members are already adopters which might indicate that before joining a CSPG, some farmers are already growing a MAF variety on their own farm (that was the case of seven farmers among the 60 respondents-members of a CSPG).

In the above table, note that nine farmers said they were members of a CSPG for four years or more. As the first CSPGs have been created in 2011, it is impossible for farmers to be member of it for more than three years. Those farmers were actually members of other agriculture groups in the past and those groups became CSPGs later on. As expected, all of these farmers have now become adopters.

2.7 Food Security

2.7.1 Perception of Hungry Season

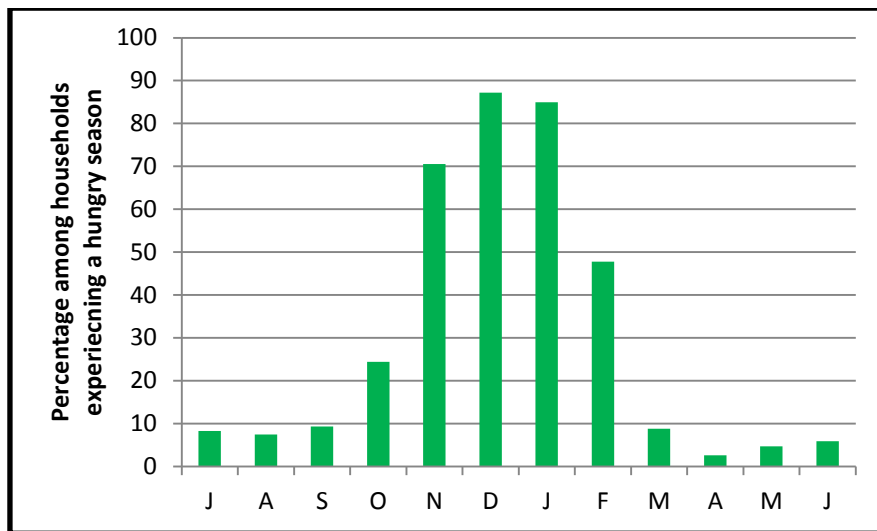
As in the MTS, farmers were asked the following question “Did your household experience “hungry seasons” during the last 12 months (Aug 2013-July 2014)?”.

82% of the respondents answered yes while it was 84% in the MTS. This difference isn't big enough to confirm that there is an actual decrease.

Among farmers mentioning they experience a hungry season, the average length of this hungry season is 3.6 months while it was 4 months in 2013. This shows an improvement of the situation which could result from more than one factor (i.e. not only due to the use of MAF varieties).

More specifically, when comparing the average length of this hungry season for all respondents (including those declaring having not experienced hunger in the last 12 months), it appeared that the period of hunger is much shorter among adopters than among non-adopters: 2.7 months vs 3.1 months. Indeed, a higher proportion of adopters mention they are not experiencing food shortage at all (26% vs 13%), which is very encouraging for the program.

Figure 17 presents for each month the proportion of households experiencing this hungry season.



[Percentages among 578 farmers]

Figure 17. Months of the hungry season (July 2013 – June 2014)

When comparing this data to the MTS, it appears that the “peak of the hungry season” in this current survey is more important: less households experience hunger from April to October while slightly more households experience hunger from November to January. There isn’t any specific explanation for that besides maybe that AS enumerators themselves were more leading the farmers to answer that the hungry season was in specific months only.

2.7.2 Consumption of Self-Grown Food Crops

The second step of the food security section was meant to cross-check the answers first given by the farmers regarding hungry seasons. Each farmer was asked during which months they were able to consume each of the food crops they are growing. Results are presented in Figure 18.

Overall, the patterns of these figures are similar to those of the MTS: maize and peanuts are consumed from the time of their harvests in March; sweet potato and cassava can be consumed more continuously during the year, and rice is usually consumed from May-June (harvest) onwards.

The main difference between the results obtained in 2013 and in 2014 is that for all crops and during nearly all months, a higher percentage of farmers in the MTS mentioned they were consuming their own crops than in this current survey. For maize only, a slightly higher proportion of farmers than in the MTS said they were consuming maize in February, March and April. It is very likely that these differences are mainly a matter of how the question was asked: apparently in the AS enumerators were leading farmers to answer that consumption was mainly around the harvest period. Of course it could also be that harvests were really smaller this year than last.

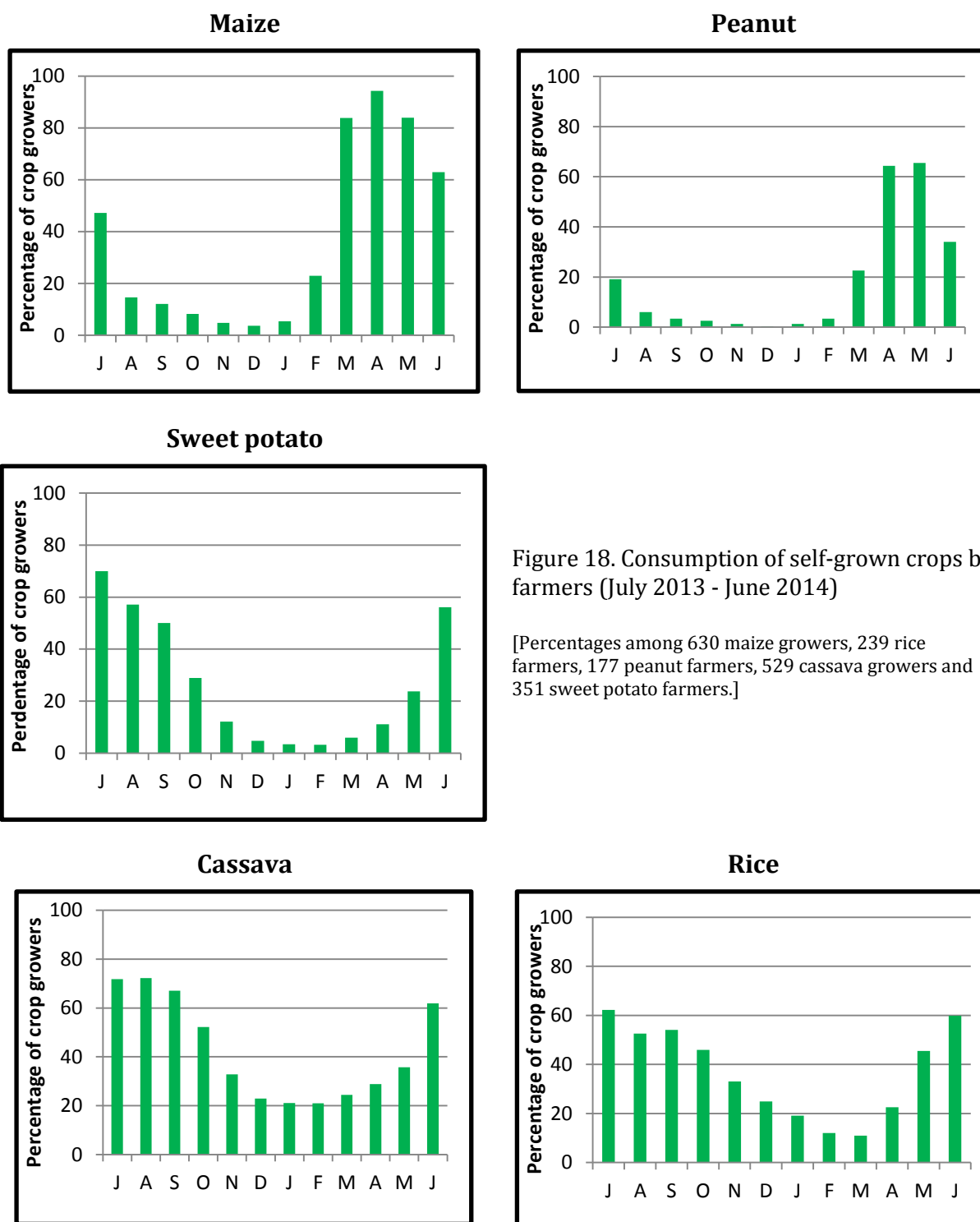


Figure 18. Consumption of self-grown crops by farmers (July 2013 - June 2014)

[Percentages among 630 maize growers, 239 rice farmers, 177 peanut farmers, 529 cassava growers and 351 sweet potato farmers.]

To cross-check the data on food crop consumption, adopters who had harvested MAF's rice and maize improved varieties were asked earlier in the interview if their rice and maize harvests were enough for their family to consume until the next harvest. The results of this question are presented in Table 26 as well as the comparison with the data collected in the food security section of the questionnaire.

Table 26. Comparative analysis of the duration of consumption of self-grown maize and rice

	1. Is the total amount of maize/rice harvested sufficient until the next harvest season?		2. From Aug13 to now, when were you able to eat your own maize/rice? (average duration)
	Yes/No	If No, for how many months can your family eat self-grown maize/rice?	
Maize	50% Yes		5.7 months
	50% No	Average: 4.4 months	4.2 months
Rice	59% Yes		6.3 months
	41% No	Average: 5 months	3.6 months

[Answers among 148 and 26 Sele and Nakroma growers]

The first observation is that about half of the farmers who answered question 1 said they had enough maize or rice to consume until the next harvest. On the other hand, when asked again later on (second question), these farmers said on average they could consume maize for about 5,7 months and rice for about 6.3 months, which isn't enough to reach the next maize or rice harvest.

Secondly, for farmers who answered “No” to the first question, it appears that the duration of maize/rice consumption in the first question is slightly lower than what farmers mentioned later on (question 2).

In conclusion, the reality is probably in between both answers. Hence, it could be that consumption of food crops as reported in the charts above is underestimated for maize and rice. This confirms what was mentioned earlier: enumerators in this survey were probably unintentionally leading farmers to answer that consumption was mainly around the harvest period.

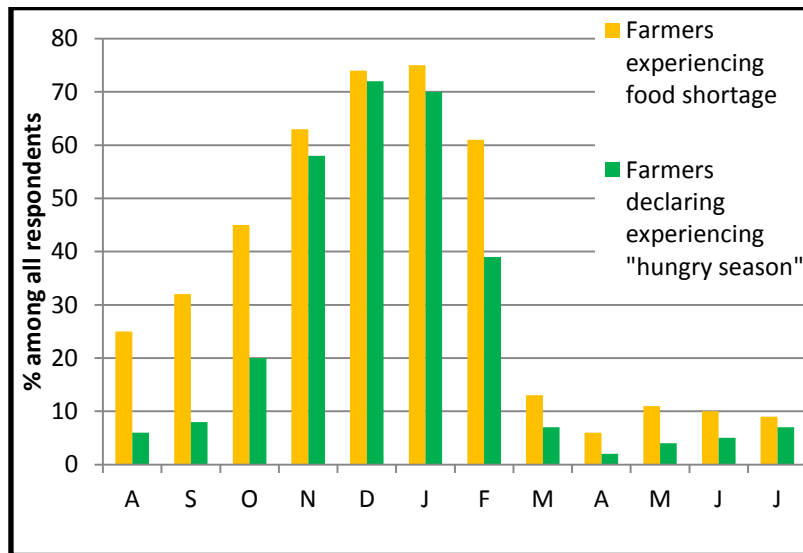
2.7.3 Food Shortage and Hungry Season

Food shortage was defined as a period when households have none of the following self-grown food crops to consume: maize, rice, peanut, cassava or sweet potato.

In this survey, 81% of the sample experienced at least one month of food shortage which is coherent with the proportion of farmers saying their family experienced hunger but is much higher than the proportion of farmers experiencing food shortage in the MTS (62%). Also on average, the duration of food shortage is 4.2 months²⁷ which is higher than the 3.8 months mentioned by farmers for the hungry season and also than the duration of food shortage calculated in 2013 with the MTS data (2.7 months). Keeping in mind the fact that the AS data on consumption was underestimated, one can assume that the real food shortage duration is actually between 3.2 and 4.2 months.

This issue is again reflected in Figure 19: the proportion of farmers experiencing food shortage is always higher than the proportion of respondents who experienced hunger. Of course, it can be that farmers overcame the lack of self-grown food crops to eat by buying more rice as well as other coping strategies. In the MTS, most farmers had reported longer periods of “hunger” compared to the actual periods of food shortage.

²⁷ Duration of food shortage is calculated among all farmers, including farmers not experiencing food shortage.



[Percentages among 698 farmers (hungry season) and 671 farmers (food shortage)]

Figure 19. Comparison food shortage vs. hungry season

2.7.4 Factors influencing increased Food Security

Chi-square tests were conducted to identify which factors were influencing the fact that a farmer experienced food shortage or not (which is different from the “perceived hungry season discussed in 2.7.1). The following factors were found to be of influence:

- **Region:** Depending on where farmers live, there are more or less chances that they will experience food shortage. From the AS data, the Eastern region is the region where there is the smallest proportion of farmers experiencing food shortage (69% versus 87% in the central and western regions).
- **Existence of a CSPG in the suco:** The fact that the suco has a CSPG or not influences food shortage: among farmers living in a suco where there is a CSPG, 78% were experiencing at least one month of food shortage whereas 89% of farmers living in a suco without any CSPG experience food shortage.
- **Member of a CSPG:** Similarly, being a member of a CSPG positively influences the fact that a farmer won’t experience food shortage.
- **Gender of the head of household:** The gender of the head of household influences the fact that the family might encounter periods of food shortage. In fact, among female headed households, 89% of them experienced at least one month of food shortage against 79% among male headed households.

Surprisingly, the chi-square test ran with the factor “adoption” revealed that adoption doesn’t influence the fact that a farmer will or not experience food shortage. But when ran with the factor “hungry season”, the result of the test is positive: the fact that a farmer is an adopter or not influences the fact that his family perceived experiencing hunger during specific months. As a result, 74% of adopters said they experienced at least one month of “hungry season” versus 87% among non-adopters.



Figure 20. Respondents were given calendars and brochures to thank them for the time spent answering our questions

2.8 Impact

2.8.1 Results of the Likert Scale Questions

At the end of the survey, adopters were asked to give their opinion regarding five statements using a Likert scale. Results of this section are presented below.

Table 27. Results of impact questions

Growing MAF varieties ...	Strongly disagree	Disagree	Neither Agree nor disagree	Agree	Strongly agree	No answer
...has helped me to grow more food		3%	7%	66%	22%	3%
...has reduced the number of months during which my family experienced hunger.		5%	17%	54%	22%	3%
...has helped us to become less poor	4%	19%	26%	31%	16%	5%
...has helped me to diversify the crop varieties I grow		1%	8%	64%	25%	2%
...has encouraged me to continue to farm		9%	7%	57%	26%	2%

[Answers among 225 adopters who answered these questions]

In general, most adopters agreed with the statements proposed (50-60% agreed while 10-20% strongly agreed). The most popular statement was: “Growing MAF varieties has helped me diversify the crop varieties I grow”; 89% of respondents agreed or strongly agreed. Indeed, this statement seems quite obvious.

The statement for which the proportion of farmers disagreeing is the highest is: “Growing MAF varieties has helped us to become less poor” (23% in total). Many farmers explained that they grow MAF varieties for consumption and not for selling, which is why they do not consider that growing these varieties has helped them become less poor.

An interesting result is that of the reduction of hungry months: 77% of the respondents agreed or strongly agreed but 23% said they disagreed or said they neither agreed nor disagreed. This might suggest that a significant number of adopters aren’t sure that growing MAF varieties makes a real difference in terms of food security even though most agree that it helps grow more food (first statement).

When looking more closely at the results of both of these statements (growing more food and reducing hungry months), one can see that:

- among 39 farmers who said they disagreed or “neither agreed nor disagreed” with the statement on hunger, three respondents agreed or strongly agreed that growing MAF varieties helps increasing food production;
- among the 21 farmers who said they disagreed or “neither agreed nor disagreed” with the statement on growing more food, three respondents also agreed or strongly agreed that growing MAF varieties helps reducing the number of hungry months.

In other terms, if growing MAF varieties is perceived as helping to grow more food, this increase is often perceived as not enough to reduce hunger within the family.

2.8.2 Factors influencing the Opinion of Farmers about Impact-Related Statements.

Chi-square tests were run with several variables to assess which factors are influencing the fact that a farmer rather agrees or disagrees with each of the five statements. Among the different factors tested, the duration of growing MAF varieties is the only one where a correlation was found. Other factors such as the size of the area grown with improved varieties, or the fact that an adopter grows several MAF varieties didn’t influence farmers’ opinion regarding the five “impact statements”. This indicates that longer term adopters have clearer opinions on how growing MAF varieties impacts on their families.

The following points summarize all the existing correlations that were identified:

- The longer a farmer grows Nakroma, the more he agrees with the fact that growing MAF varieties (1) helped him to grow more food, (2) helped him to reduce the number of hungry months experienced by his family and (3) helped him become less poor.
- The longer a farmer grows Sele, the more likely he is to agree with the fact that growing MAF varieties has helped him become less poor.

3. Discussion and Recommendations

3.1 Findings

3.1.1 Number of Households Reached by the Seeds of Life Program

Based on the same methodology as the one used to calculate the total number of farmers reached in the baseline and in the MTS, it is estimated that in 2014, the Seeds of Life program has reached 40,957 households.

Indeed, the number of households involved in crop production in 2014 is estimated to be 126,023 (based on data from the 2010 Census and an annual growth rate of 2%). As a result, with an estimated 32.5% adoption in 2014, the total number of households reached by the SoL Program in mid-2014 is 40,957.

If this trend is sustained, it is likely that the end-of-program target which is to get to 50% of households involved in crop production will be reached. In fact, there are still two more seasons coming before the end-of-program in mid-2016.

3.1.2 Reduction in Experience of Food Shortage

The second important indicator of SoL3's logframe is *"Percentage of crop-producing households experiencing periods of food shortage decreased by 33% in Timor-Leste"*.

Even though this wasn't the primary objective of this survey, questions about food shortage were asked to farmers. Two types of data were collected:

- Proportion of crop-producing households experiencing a "hungry season".
- Proportion of crop-producing households having none of the following self-grown food crops to consume for one month or more: maize, rice, peanut, cassava or sweet potato.

The first data collected shows a slight improvement since 2013: 82% of the farmers said their family experienced a hungry season in the last 12 months, while it was 84% in 2013. Also, the duration of the "perceived hungry season" is shorter this year: 3.6 months instead of 4 months in 2014.

It is important to mention here that the notion of "hungry season" is very subjective and may have been interpreted differently by different farmers within the same survey or even between different or successive surveys.

The second data is an attempt to define more objectively the concept of "experiencing periods of food shortage" as it is mentioned in the program's logframe.

Surprisingly, the data reveals an increase in food shortage since 2013: 81% of respondents have experienced at least one month of food shortage versus 62% in 2013. Also on average, the duration of food shortage is 4.2 months versus 2.7 months in 2013.

As explained earlier, rather than highlighting an actual deterioration of the situation of crop growers in Timor-Leste, this decrease is probably due to a bias in the data collection itself. Very clearly, this incoherence reveals the difficulty of collecting “food shortage data” without having defined beforehand an Objectively Verifiable Indicator.

Another interesting input in regards to this indicator is the fact that most adopters believe that even though growing MAF varieties helps them to grow more food, that isn't directly linked to a reduction in the number of months their family experiences hunger.

3.2 Learnings and Recommendations

3.2.1 Increasing Access to MAF Varieties

Again, as revealed in the MTS, a majority of farmers are very satisfied with MAF varieties:

- more than 90% of adopters are planning to continue growing the MAF varieties,
- about 80% of non-adopters said they would like to grow it but do not grow it yet because they have no seeds,
- 64% of respondents said they would be ready to pay 1.5\$ to purchase 1 kg of improved maize varieties if it was available for sale.

Nevertheless, farmers' attitude is still very passive: 66% of farmers said they chose to grow Sele because seeds were given for free to them (and not because they were purposely looking for this variety). Only 7% of Sele growers and 2% of Noi Mutin growers actually spent some money to buy seeds (mainly from the market, and one farmer bought Sele from a farmers' association in Liquiça).

Therefore, a number of recommendations can be drawn from this survey in order to create an increased demand for these varieties and as a result, speed-up the adoption:

- More efforts are needed in the western region where adoption is significantly lower than in the rest of the country. The big district of Ermera for example still has a very low level of adoption which might be linked to SEO's limited working capacities.
- Seeds and cuttings distributions need to be better organised in order to generate a stronger and more visible impact. The main issues revealed were: (1) late timing of the distributions, (2) lack of monitoring post-distribution and consequently unrealistic expectations of the uptake, (3) lack of technical information provided together with the seeds/cuttings. Some of the important messages to give when distributing seeds/cuttings are: how to store Sele and Noi Mutin; how to limit contamination of Sele and Noi Mutin by other varieties; the recommendation to renew Sele and Noi Mutin seeds every three years to offset the loss of genetic quality; best conditions and practices to grow Nakroma; how to maximize the uptake/growth of Ai-luka and Hohrae cuttings, etc.

- Hohrae is very much appreciated by farmers: it's often grown on larger areas than the local varieties, often grown for several years already, and cuttings are easily passed on from one farmer to another. It is recommended to reinforce diffusion of Hohrae through direct distributions to farmers or through CSPGs.
- Increase access to Utamua seeds through local markets as peanut seeds are often sourced from those markets.
- In general, continue raising awareness of Timorese farmers on MAF varieties, their names (especially for Ai-luka and Hohrae), their benefits and where they can be found.

Finally, CSPGs are a key factor to increase adoption. A number of recommendations regarding CSPGs are presented below.

3.2.2 Guiding and Monitoring Existing CSPGs

Overall, this survey revealed that CSPGs are crucial to ensure a sustainable diffusion of the MAF varieties. In fact, 49% of the adopters living in a suco where there is a CSPG are members of a CSPG (60 respondents). Also, CSPGs are an important source of information in the village: 42% of farmers who are aware of the existence of a CSPG in their suco were familiar with at least one MAF variety versus 21% among farmers who said there isn't any CSPG in their suco.

Yet, the assumption that in 2014, more farmers that aren't part of a CSPG will have been able to source seeds from those groups is still not completely verified. That is partly because many groups are still in the seed multiplying phase and so haven't distributed seeds to their members, and even less to non-members. Hence, it is expected that more diffusion should happen next year when those groups will be more mature.

However, a number of recommendations can already be drawn:

- More control/guidance by SEOs regarding the use of the seeds produced by the group in order to ensure that all members have quick access to it. Given the very wide scale of work of the Community and Commercial Seed Development program component (13 districts, 1000+ CSPGs), it is very likely and understandable that not all SEOs and CSPGs understand and apply the approach promoted by the MAF/SoL program (a few such cases of inappropriate / incorrect behaviour were found).
- In general, more monitoring of the 1000+ CSPGs to be able to have a realistic idea of the diffusion of seeds through this channel. Important data to update annually would be (1) the proportions of CSPGs that have stopped/failed, (2) those that are still in the seed multiplying phase (including 2 or 3 years CSPGs that have failed the first cycles), (3) those having already shared planting material among all members, and finally (4) those having shared seeds to non-CSPG-members (seed revolving scheme or by selling out seeds, etc.). Such data would probably have to be collected through SEOs and randomly spot checked to assess its validity.

- Ensuring that groups apply the “seed revolving scheme” stipulating that successful CSPGs should, through their supporting SEO, share 5kg of seeds with another group.
- More awareness raising in the sucos regarding the existence of CSPGs that are already two to three years old, especially in aldeias that do not have a CSPG (field days, posters, brochure). Similar campaigns should be done for Commercial Seed Producers to ensure they progressively build a local market demand and do not rely only on expectations that the government will buy their harvests.
- SEOs should exercise stricter control that CSPGs should have members from different households, and that the number of members from a single household should be limited to preferably only one. Also, selecting farmers that are not already adopters would definitely help increasing the number of adopters.
- Given the positive influence the presence of CSPGs has on the uptake of the improved varieties, support MAF in establishing new CSPGs in sucos and aldeias where they do not yet exist.
- Increase awareness among CSPG members themselves regarding the existence of other MAF varieties would help increasing familiarity with MAF varieties in general.
- In relation to the previous section, CSPGs and CSPs could be used as a way to disseminate messages regarding the use of MAF varieties (“best practices”).
- Multiplying distributions to vulnerable households through CSPGs.

3.2.3 Future Adoption Surveys

As for the MTS, more lessons were learned from the implementation of this adoption survey. The most important ones are:

- The need to ensure a more random selection of farmers. Several strategies have been discussed: selecting three random aldeias per suco instead of two, randomly pre-selecting respondents from the list of inhabitants in the sampled aldeias, avoiding intervention from the SEO and local leaders while selecting respondents.
- The need to elaborate better indicators and strategy for collecting data on food shortage. Indeed, this data will be very important for the end-of-program survey. A lot of incoherence in the data was still revealed in this year’s adoption survey.
- Improved data cleaning process: This was the first time data collection was done electronically on such a large scale and the data cleaning process took some time to be effective. Because data cleaning could be done very quickly, it also required the data collection team to regularly review and correct data while still in the field and busy collecting more data. Defining a clearer methodology and working channel for data cleaning will be necessary in the coming survey.
- A number of specific weak points in the questionnaire were also found. Among others: the duration of membership in a CSPG should not include membership in other agriculture groups; better criteria for “isolated aldeias/sucos” should be predefined and data collected by the supervisors during the survey; information

should be noted about how precise the variety identification was conducted (did the enumerator check the field? saw some maize cobs? etc.); simplification is needed on questions regarding local varieties grown with MAF varieties, etc.



Figure 21. Enumerator interviewing a farmer in her kitchen, under maize cobs of local, Bisma and Sele varieties, Oecusse (suco Usi Tacae).

Appendix I: Sampled sucos and aldeias

DISTRICT	SUB-DISTRCT	SUCO	ALDEIAS (two per suco)
Aileu	Aileu Vila	Hoholau	Aslimhati Saharai
	Remexio	Fadabloco	Rileu Lilitei
		Hautoho	Lebutu Aibutihun
Ainaro	Maubisse	Manetu	Rusulau Hahi-Tali
		Edi	Raimera Lobibo
		Horai-Quic	Lauheli Hatosao
Baucau	Baucau	Triloca	Macadai Badu Ho'o
		Seical	Loiboro-Uai Ague
	Laga	Tequino Mata	Samagua Bulubai
		Libagua	Tirilolo Buibata
	Quelicaí	Waitame	Gaman Caranu
		Namanei	Uasufa Loirae
	Baguia	Alaua Craic	Uasufa Afaguaia
		Haeconi	Larigua Afalari
Bobonaro	Balibo	Balibo Vila	Fatululic Belola
		Leolima	Rai Fatuc Bour
	Atabae	Hataz	Aidabasalala Aidabaleten
	Bobonaro	Carabau	Nunubuti Carabau
		Lourba	Zo-Belis Gumer
		Malilait	Malilait Mali-Lu
Covalima	Fatumean	Fatumean	Lebo Fatumean
	Fohorem	Fohoren	Lo'o Hali Fatuc Laran
		Dato Tolu	Fatuc C. Leten Natardic
	Tilomar	Lalawa	Halemea Ai Oan
Dili	Metinaro	Sabuli	Behocir Behauc
	Atauro	Beloi	Usubemaco Adara
		Biceli	Pala Ilidua/Vatu'u

DISTRICT	SUB-DISTRCT	SUCO	ALDEIAS (two per suco)
Ermera	Railaco	Railaco Leten	Colhuinamo Manoponihei
		Samalete	Leborema Aiurlala
	Ermera	Poetete	Urluli Poepun
		Leguimea	Titihar Sinilelo
	Letefoho	Hatugau	Riaheu Hunda
	Hatolia	Ailelo	Leirema Santa Cruz
		Mau-Ubu	Caisoro Arleu
		Lissapat	Tidibessi Hatupae
Lautem	Lospalos	Leuro	Soromoco Leuro
	Lautem	Maina II	Lereado Codo
	Iliomar	Iliomar I	Vatamata Ossohira
		Tirilolo	Etevata Tirilolo
Liquiça	Bazartete	Fahilebo	Fatuneso Tuhilo Craic
		Leorema	Urluli Railuli
	Liquiça	Laculai	Hunehei Natarae
	Maubara	Vatuboro	Raeglelu Sabulau
Manatuto	Laclo	Uma Caduac	Ilimano Hahi Hoho
	Soibada	Leohat	Malus Hun Leo Hat
		Manlala	Manlala Daunloroc
Manufahi	Same	Grotu	Dato Rai Colidasi
	Fatuberliu	Fahinehan	Riamori Darmata
	Turiscail	Aitemua	Laclo Furaclau
Oecusse	Pante Makasar	Lalisuc	Padiae Banoco
		Bobocase	Fatubizae Bihala
	Nitibe	Bene-Ufe	Manan Citrana
		Banafi	Hautefo Cuanobe
	Oesilo	Usi-Tacae	Pune Buqui
Viqueque	Uatucarbau	Unai-Uma	Osso-Mali Ala Oli
	Ossu	Loi Huno	Wai-Heda Samaliu
		Lia Ruca	Liacuda Cai-Ua
	Watulari	Afaloicai	Ossocaiua Cailaque
	Viqueque	Uma Uain Craic	Uhacae Bosabein
		Uma Uain Leten	Retica Macalicu

Appendix II: Variety Identification Check List for Maize

MAIZE variety check list

1: How many varieties do you grow? (Don't ask immediately "What varieties do you grow?")

2: Which varieties are these?

Steps in the questioning	LOCAL	SELE	NAI (only few cases)	NOI MUTIN
3. Can I see a maize cob? If not able, ask to describe shape and colour LOOK AT SEVERAL COBS (3-4)	Local maize: less than 12 seed lines Local maize can be: <i>batar bo'ot, batar lais, local, other</i>	IMPROVED VARIETY: More than 12 lines on cob IMPROVED VARIETY: Top of the grains <u>can</u> be slightly white, a <u>can</u> have a "tooth-shape" The different improved varieties are (often called "batar bo'ot" by farmers!): Common one: Sele, Noi Mutin, Bisma Few cases only: Nai, Kalingal, Arjuna, Angola, Hibrida, etc. ("hibrida" is just a name farmer's use for some improved varieties)		
	Colour : mostly mixed colours Seed : big and small	colour: bright yellow seed: big and thick	colour: dark yellow seed: big	colour: white seed: big and thick
		How to say if the variety has been contaminated or not: Grains on maize cob have different colours (more than three colours) Maize cob is small (short)		

Steps in the questioninig	LOCAL	SELE	NAI (only few cases)	NOI MUTIN
4. Source of the seeds	Can be : - Own seed - Bought from market - Received from neighbour or family -	Several possible sources (bought in market, own seed, received from others). Note: - CARE: distributed only Sele - World Vision in Baucau, Aileu, Bobonaro: distributed Sele in small packs - RDP3 (Manufahi)	Can be from several sources. like : - Distributed by MAF - Bought from market - Received from other people - Own seed - ...	Can be from several sources. like : - Distributed by MAF and NGO (RDP3) - Bought from market - Received from other people - Own seed - ...
5. How many years did you grow it?	Sometimes, since grand-parents time.	Maximum 7-9 years	Maximum 2-7 years	Maximum 2-7 years
6. Leaf	Straight up then goes down	Straight up	Straight up then goes down	Straight up then goes down
7. Stem section	Can be white, red, yellow, purple...	Some have red circle	All is white (white circle)	White
8. Plant	Can be green, purple, ...	All green	Green and top of the plant/stem is reddish	green
9. Flower	There can be many or only few flowers. Colour can also vary.	Big flowers, mainly greenish	Smaller flowers, redish	Big flowers

10. Have you tried any new/other variety, even on a small plot?

11. Check information from the Suco Extension Officer (seed distribution, seed production group, ...)

PLACES OF DISTRIBUTION:

NAI has been distributed in Lospalos (Fuiloro, Caulutur), Aileu and Manufahi (Hola Rua)

ATTENTION

MAF also distributed Bisma from Indonesia, which looks like Sele. (also looks like Arjuna or Kalinga but that was a long time ago and not that much distributed) In Bobonaro/Baucau, there are some local varieties that look like Noi mutin.

Appendix III: Contributors

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Farmers

Last but not least, the Adoption Survey would not have been possible without the 702 respondents in the 60 sucos who gave about half 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 this survey.



Figure 22. Typical interviewing conditions with a farmer and her children (Aileu).



Seeds of Life Fini ba Moris

Key findings of the adoption survey:

- In mid-2014, 33% of the Timorese foodcrop farmers, or approximately 41,000 households, grow at least one of the MAF varieties for maize (Sele, Noi Mutin and Nai), rice (Nakroma), peanut (Utamua), sweet potato (Hohrae 1, 2 and 3) or cassava (Ai-Luka 1, 2 and 4). The highest adoption rates are found in the Central and Eastern regions (39%), with 25% in the Western region.
- The MAF maize varieties are the most commonly grown varieties : 20% of maize growers grow Sele, and 10% of maize growers grow the white variety Noi Mutin. The adoption rates of the other varieties are: Nakroma 14%, Utamua 12%, Ai-Luka 9% and Hohrae 5%.
- The main source of the improved varieties for most farmers are still free distributions of seeds and cuttings by MAF and NGOs.
- In mid-2014, there are more than 1,000 Community Seed Production Groups across the country. However, diffusion of MAF varieties to farmers outside these groups is still rather limited.

*Improved food security through increased
productivity of major food crops*

