Seeds of Life
Fini ba Moris

Survey of Maize Storage Drum Use in the Raumoco Watershed Area

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

November 2015

Australian Aid

Seeds of Life
Fini ba Moris

Survey of Maize Storage Drum Use in the Raumoco Watershed Area

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

November 2015

Australian Aid

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, 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.

The data for the study was collected by Sabilio dos Santos and Laurentino Ximenes. The data analysis and report preparation was done by Luc Spyckerelle, with assistance from Sabilio dos Santos.

Suggested citation:
Seeds of Life. 2015. *Survey of Maize Storage Drum Use in the Raumoco Watershed Area*. Seeds of Life program, Ministry of Agriculture and Fisheries, Dili, Timor-Leste.

Table of Contents

List of Figures

List of Tables

Executive Summary

As part of the activities in the Raumoco watershed area, 200 l metal drums were distributed in May and September 2014 by the Timor-Leste Maize Storage Project to farmers in nine sucos.

In September-October 2015, a small survey was conducted in six sucos in the administrative post Luro to assess the use of the drums for storing maize, the use of the improved seeds that were distributed together with the drums, and the use of maize shellers which the farmers could also buy.

The survey found that 72% of the drums had currently maize in them, and another 5% of the drums had held maize before but were now empty.

The drums served their purpose of storing maize very well. Of the 250 drums that held maize – all of good quality –, the degree to which these were filled was as follows:

- 82% were between 2/3 full and completely full
- 12% were betweem 1/3 and 2/3 full
- 5% were less than 1/3 full

More than 80% of the farmers had stored maize in their metal drums, and 70% of those had only maize stored in drums. Nearly a quarter of the farmers also stored maize in sacks. When asked why they did so, they said that their maize harvest was larger than what they could store in the drums.

Together with the metal drums, the farmers had also received 1,5 plastic bottles with improved maize seed. Basically all the farmers (97%) had planted all of that seed, and half of the farmers had also planted another maize variety besides it.

For such activities as filling the drums with maize, taking maize out of the drums, and shelling the maize using a sheller, the farmers were asked whether this was mostly done by women, men, boys or girls, or a combination of them. Filling the drums with maize, and taking maize out of the drums were very much 'wife and husband' tasks, with boys and girls also joining in to fill drums (but less so in taking maize out of drums).

Shelling of maize – which is mostly done in several sessions, and not all in one go – was still predominantly (84%) done by hand, without using a sheller. Maize shelling often involves all household members, or is done by the wife and husband together.

1. Introduction

The Seeds of Life (SoL) program in Timor-Leste is an agricultural research and development program which focuses on identifying and testing improved varieties of major foodcrops (maize, rice, peanut, cassava and sweet potato), and providing Timorese farmers access to these improved varieties. All of this is part of the program's effort to establish a sustainable national seed system.

However, it has become increasingly evident that, in addition to secure access to improved foodcrop varieties, rural communities experience other constraints that limit their capacity to move beyond subsistence agriculture. The best way to understand such complexities of assisting rural communities better was through a cross-sectoral approach with collaborating development partners in a well-defined area.

The opportunity to pursue such an approach presented itself in mid-2012. The NGO Hivos was active in the Raumoco watershed area, assisting in the establishment of a Raumoco Watershed Management Council and the development of a watershed management plan (see Figure 1 and Figure 2 for the location).

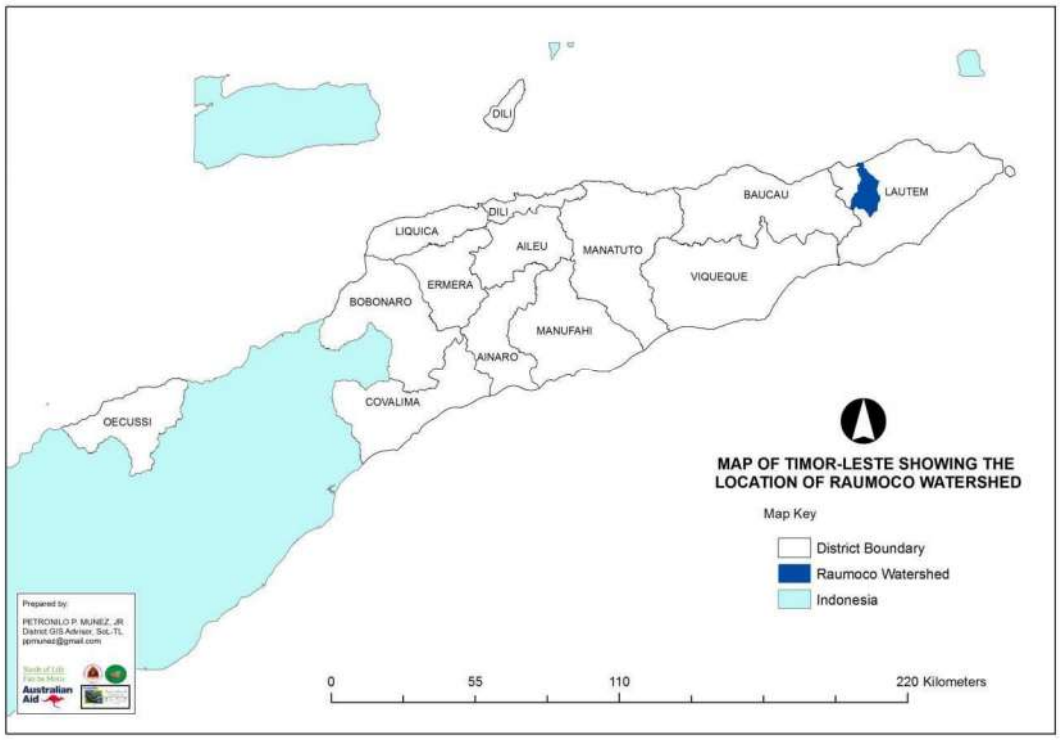

Figure 1: Location of the Raumoco watershed area in Timor-Leste

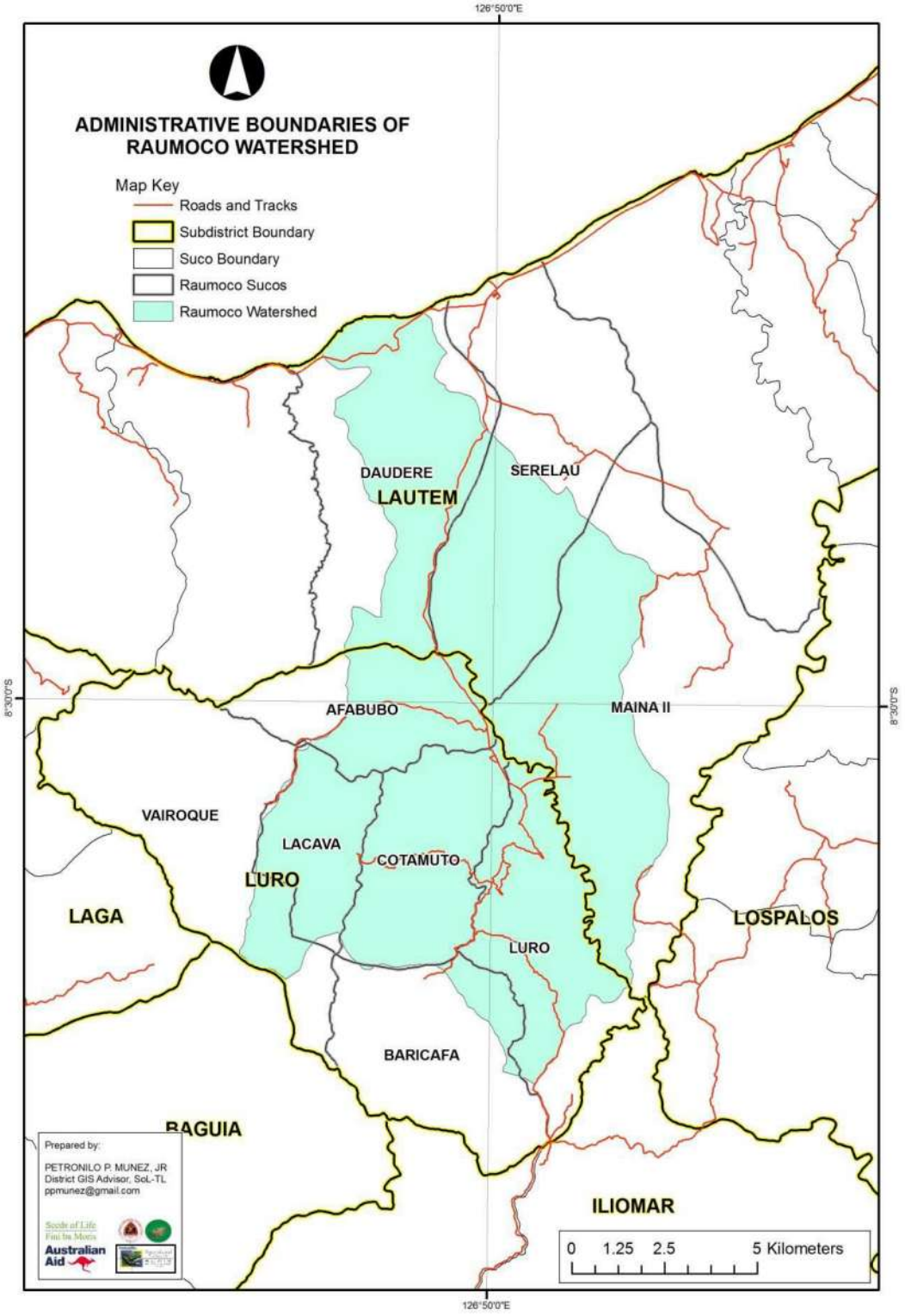

Figure 2: Administrative boundaries of the Raumoco watershed area

SoL facilitated a series of workshops with other development partners to discuss the implementation of complementary activities in the area. It was agreed that SoL would provide assistance for the implementation of a Community-Based Natural Resource Management process in two sucos (Cotamuto and Lacawa). Other programs, such as R4D, BESIK and PNDS, were also aligning themselves to utilize and build on the community engagement and empowerment undertaken by the communities of the two sucos.

One complementary activity which was also implemented in the Raumoco watershed was the distribution of maize storage drums provided by the Timor-Leste Maize Storage Project (TLMSP). The drums were made available on the same conditions as in the other municipalities were the project distributed drums:

a) Interested farmers had to make a deposit of $ 10 per drum.
b) The household had to grow enough maize to fill the number of drums it requested. One 200 l drum can hold 180 kg of maize grains.
c) The maximum number of drums a household could purchase was four drums.

In early 2013, SoL and TLMSP decided to collaborate more intensively. SoL would provide a 1.5 l plastic water bottle of improved seed (about 1.3 kg) with every drum that TLMSP would distribute. In this way the buyers of the maize storage drums were assured of having improved seed for planting, and it helped SoL to reach more of it target group (see Figure 3).

Figure 3: Farmers receive information on the maize storage drum and the improved seed at the time of distribution

Between the end of June and mid-September 2015, according to the TLMSP records, total of 1,799 drums – together with improved maize seed – were distributed to 819 farmers. Table 1 shows the drum distribution in nine sucos, and the number of farmers which had between one and four drums.

Table 1. Number of recipients and number of drums distributed

Administrative Post, Suco and Aldeia	Number of drum recipients	Number of farmers by number of drums				Total number of drums
		1	2	3	4	
Lautem	**9**	**9**				**9**
Daudere	**3**	**3**				**3**
Aelafa	1	1				1
Samahira	1	1				1
Uanambere	1	1				1
Serelau	**4**	**4**				**4**
Adavari	2	2				2
Ra'Ano	1	1				1
Unspecified	1	1				1
Maina 2	**2**	**2**				**2**
Lereira	2	2				2
Luro	**810**	**285**	**254**	**87**	**184**	**1,790**
Afabubu	**81**	**22**	**9**	**11**	**39**	**229**
Dalari	43	2	6	4	31	150
jefaliu	38	20	3	7	8	79
Baricafa	**110**	**48**	**41**	**7**	**14**	**207**
Ussufassu	29	13	12	1	3	52
Sarelari	43	16	17	1	9	89
Afaia	38	19	12	5	2	66
Cotamutu	**276**	**118**	**76**	**32**	**50**	**566**
Buanomar	98	68	17	6	7	148
Etanisi	40	12	19	4	5	82
Ouroma	138	38	40	22	38	336
Lacawa	**80**	**23**	**35**	**8**	**14**	**173**
Oneraba	37	10	18	2	7	80
Borugae	29	8	12	5	4	63
Boruvali	14	5	5	1	3	30
Luro	**222**	**39**	**89**	**28**	**66**	**565**
Abere	69	10	31	10	18	174
Alahira	31	9	10	4	8	73
Amahira	74	8	34	11	21	193
Hailarino	41	12	12	1	16	103
Vatalarino	7		2	2	3	22
Wairoque	**41**	**35**	**4**	**1**	**1**	**50**
Liarafa	2	1		1		4
Luto	14	13	1			15
Soba	9	6	2		1	14
Afanami	12	11	1			13
Lutoro	4	4				4
Total	**819**	**294**	**254**	**87**	**184**	**1,799**
Percentage of recipients		36%	31%	11%	22%	
Percentage of drums		16%	28%	15%	41%	

2. Survey Design and Survey Implementation

2.1 The TLMSP Impact Survey

The Timor-Leste Maize Storage Project ends on 31 December 2015, and as part of the end of project activities an impact survey was conducted by the project between late August and mid-September. This impact survey consisted of two parts:

a) An IFAD-specific results and impact management system (RIMS) survey. This also involved taking anthropometric measurements of children less than five years old in the sample households;
b) A survey to check on the status of the drums, their use, the use of maize shellers which had also been distributed, and on the use of the improved maize seed which had been distributed together with the drums.

The RIMS part of the survey was conducted in the conventional way, using paper forms. The main reason for this was because IFAD has developed an application which enables projects to immediately calculate the RIMS results once the data has been entered.

For the drum use survey, a mixed approach was used. Since the survey was conducted in teams of two, one person conducted the interview noting down the answers on a paper questionnaire, and the second person entered the answers in a similarly formatted e-questionnaire, using a 7' tablet. The application ODK Collect was used to conduct the questionnaire with the tablets (see Figure 4).

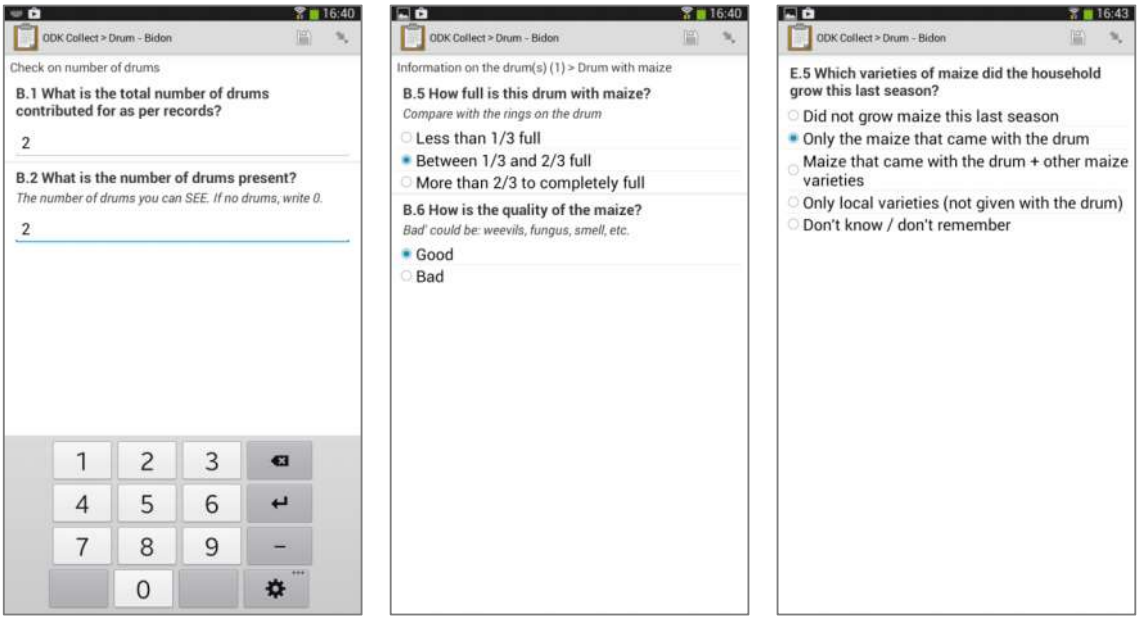

Figure 4: Examples of questions in the e-questionnaire of the impact survey

The TLMSP impact survey involved 893 farmers in six municipalities. As SoL had already indicated to TLMSP that it intended to conduct a small study on the use of the drums in the Raumoco watershed, none of the nine sucos listed in Table 1 were included in the sample of the TLMSP impact survey.

2.2 The Raumoco Drum Survey

For the drum survey in the Raumoco watershed, the IFAD RIMS assessment was not a requirement; the survey could focus exclusively on the drums survey.

In order to save time in conducting the survey, it was decided to have two survey forms:

a) A '**Short**' questionnaire which focused exclusively on the drums:
   - How many drums were bought and how many are present on the farm?
   - If one or more drums are missing, where are they?

   And for each drum:
   - Is this drum currently used to store maize?
   - If there is maize in the drum, how full is the drum?
   - Is the quality of the maize in the drum good or bad (e.g. with weevils)?
   - If there is no maize in the drum now, has maize been stored in it before? [It could be that the household already sold part of its harvest].
   - Is the location of the drum good (protected from soil and rain)?
   - Is the drum in good condition (no screwcap missing, not cut open, etc.)?

b) A '**Long**' questionnaire which included the same questions as in the 'Short' questionnaire, but with additional questions on:
   - Which household members (husband, wife, boys, girls, others) filled the drums with maize, and took maize out of it?
   - Has maize been taken out of the drums in the last month, and if yes, how much was taken out the last time?
   - How does this household store its maize? Are other ways of storing the maize still used, beside the drums?
   - Did they get a bottle of improved maize seed? If yes, do they remember the name?
   - Did the household plant the improved maize that came with the drum?
     If yes, how much did they plant of it?
     If not all, why not?
   - Which varieties of maize did the household plant? Did they also plant other varieties than the improved varieties?
   - Have they ever bought maize seed in the last two years? Would they be willing to pay $ 1.50 for a kg of improved seed?

- Did they receive or buy a large or small maize sheller?
- Was the sheller used? If not , why not?
- Has the maize from the last harvest been shelled?
  If yes, all or only part of it?
  Was it shelled in one go, or spread out over time?
  If not, why not?
- Who in the household shelled the maize?

From the TLMSP database of drum recipients, lists of candidate farmers for the long and short interviews were prepared (see Figure 5). For practical reasons, it was decided to only conduct interviews in the administrative post Luro.

No.	Naran Primeiro	Apelido	No. kartaun eleitoral	Data moris	Suco	Aldeia	# bidon $10.00	Sele	Noi Mutin	Data simu bidon
192			0336681	5 03 1948	Cotamutu	Buanomar	1		1	30/5/14
193			0557120	16/10/1962	Cotamutu	Buanomar	2			30/5/14
194			0330576	10 08 1948	Cotamutu	Buanomar	1	2		30/5/14
195			0557163		Cotamutu	Buanomar	1	1		30/5/14
196			0330727	1 02 1970	Cotamutu	Buanomar	1	1		30/5/14
197			0336595	7 06 1962	Cotamutu	Buanomar	1		1	30/5/14
198			0336590	17/07/1967	Cotamutu	Buanomar	1	1		30/5/14
199			0336661	26/4/1966	Cotamutu	Buanomar	1		1	30/5/14
200			0336541	7 04 1946	Cotamutu	Buanomar	1	1		30/5/14
201			0358118	15/01/1995	Cotamutu	Buanomar	1		1	30/5/14
202			0557093	3 01 1940	Cotamutu	Buanomar	1	1		30/5/14

Figure 5: Potential interviewees for short and long questionnaires
in suco Cotamutu, aldeia Buanomar

This gave a list of 130 candidate farmers for the short questionnaire, and the same number for the long questionnaire. It was decided to interview as many of these as could possibly be managed in the three weeks allocated for data collection.

3. Survey Findings

3.1 Number of Respondents and Number of Drums

In total, 148 farmers (123 male, 25 female) were interviewed over 12 days of data collection. There were 77 farmers interviewed with the short questionnaire, and 71 farmers with the long questionnaire (see Table 2).

Table 2: Number of respondents and number of drums surveyed

Suco and Aldeia	Type interview		Number of respondents			Number of drums onsite		
	Short	Long	Female	Male	Total	Female	Male	Total
Afabubu	**11**	**9**	**4**	**16**	**20**	**8**	**54**	**62**
Dalari	6	8	2	12	14	6	43	49
Jefaliu	5	1	2	4	6	2	11	13
Baricafa	**17**	**15**	**7**	**25**	**32**	**10**	**57**	**67**
Afaia	6	7	2	11	13	4	26	30
Sarelari	6	3	3	6	9	3	16	19
Ussufassu	5	5	2	8	10	3	15	18
Cotamutu	**11**	**9**	**4**	**16**	**20**	**5**	**25**	**30**
Buanomar	1	1		2	2		3	3
Etanisi	2	2	2	2	4	2	3	5
Ouroma	8	6	2	12	14	3	19	22
Lacawa	**13**	**10**	**2**	**21**	**23**	**4**	**62**	**66**
Borugae	5	3	2	6	8	4	14	18
Boruvali	2	2		4	4		12	12
Oneraba	6	5		11	11		36	36
Luro	**22**	**25**	**8**	**39**	**47**	**14**	**102**	**116**
Abere	10	11	3	18	21	7	44	51
Alahira	1	1		2	2		6	6
Amahira	6	9	3	12	15	5	31	36
Hailarino	5	4	2	7	9	2	21	23
Wairoque	**3**	**3**		**6**	**6**		**8**	**8**
Luto	3	2		5	5		5	5
Lutoro		1		1	1		3	3
Total	**77**	**71**	**25**	**123**	**148**	**41**	**308**	**349**
			16.9%	83.1%	100%	11.7%	88.3%	100%

According to the TLMSP records, the 148 farmers had a total of 335 drums. In fact the 148 farmers had in total 349 yellow drums on their farms. It appears that in some places there had been more than one drum distribution, and that the records only showed the first distribution.

The 25 women respondents had 41 drums (an average of 1.6 drums per woman), and the 123 men had 308 drums (an average of 2.5 drums per man).

The number of drums per respondent is shown in Table 3. There were two respondents who no longer had their drums on the farms, and one person had 12 drums onsite (see Box 1 for more info on this).

Table 3: Number of drums per respondent

Suco and Aldeia	Total # of respondents	# of respondents with # of drums								Total # of drums held by respondents
		0	1	2	3	4	5	8	12	
Afabubu	**20**	**1**	**3**	**5**	**4**	**5**	**1**		**1**	**62**
Dalari	14	1	1	3	3	4	1		1	49
Jefaliu	6		2	2	1	1				13
Baricafa	**32**		**12**	**11**	**4**	**4**	**1**			**67**
Afaia	13		4	4	3	1	1			30
Sarelari	9		4	2	1	2				19
Ussufassu	10		4	5		1				18
Cotamutu	**20**		**13**	**5**	**1**	**1**				**30**
Buanomar	2		1	1						3
Etanisi	4		3	1						5
Ouroma	14		9	3	1	1				22
Lacawa	**23**		**1**	**13**	**1**	**7**		**1**		**66**
Borugae	8			7		1				18
Boruvali	4			2		2				12
Oneraba	11		1	4	1	4		1		36
Luro	**47**	**1**	**7**	**22**	**3**	**14**				**116**
Abere	21		3	11	2	5				51
Alahira	2			1		1				6
Amahira	15		2	9		4				36
Hailarino	9	1	2	1	1	4				23
Wairoque	**6**		**5**		**1**					**8**
Luto	5		5							5
Lutoro	1				1					3
Total farmers	**148**	**2**	**41**	**56**	**14**	**31**	**2**	**1**	**1**	
Percentage farmers	100%	1.4	27.7	37.8	9.5	20.9	1.4	0.7	0.7	
Total drums		**0**	**41**	**112**	**42**	**124**	**10**	**8**	**12**	**349**
Percentage drums		0	11.7	32.1	12.0	35.5	2.9	2.3	3.4	100%

Two-thirds of the farmers had either one or two drums on the farm.

Box 1. A farmer with 12 drums

One farmer in suco Afabubu had 12 drums, 11 of which were full, and one drum empty.
This farmer is the SEO of suco Afabubu, and he had bought four drums for himself. Some other farmers had also put in an order for drums, but when the drums were delivered, the other farmers were no longer interested in taking the drums. The SEO therefore bought the drums from these farmers.

We also checked how accurately the TLMSP records reflected the number of drums onsite. Table 4 shows what discrepancies there were between the database record on number of drums provided to the farmer, and the number of drum encountered on site.

Table 4: Number of missing and excess drums

Suco and Aldeia	Missing drums				Exact # of drums	Excess drums				Total # of respondents
	4	3	2	1		1	2	4	8	
Afabubu	**1**		**2**	**4**	**11**	**1**			**1**	**20**
Dalari	1		2	4	6				1	14
Jefaliu					5	1				6
Baricafa					**27**	**2**	**2**	**1**		**32**
Afaia					10	1	1	1		13
Sarelari					8		1			9
Ussufassu					9	1				10
Cotamutu					**19**		**1**			**20**
Buanomar					2					2
Etanisi					4					4
Ouroma					13		1			14
Lacawa					**17**	**4**	**2**			**23**
Borugae					6	1	1			8
Boruvali					3	1				4
Oneraba					8	2	1			11
Luro	**1**	**1**	**1**		**42**		**2**			**47**
Abere		1			20					21
Alahira					2					2
Amahira					15					15
Hailarino	1		1		5		2			9
Wairoque					**5**		**1**			**6**
Luto					5					5
Lutoro							1			1
Total	**2**	**1**	**3**	**4**	**121**	**7**	**8**	**1**	**1**	**148**

For 82% of the farmers, the data in the database was correct. Where there were missing drums, they had mostly been passed on to relatives (uncle, mother-in-law, brother, …), and two recipients stated that the number of drums they had received was wrongly entered in the database.

3.2 Number of Drums used for Storing Maize

Of the 349 drums encountered during the survey, 72% had maize in them (see Table 5).

Table 5: Number of drums with and without maize during the survey

Suco and Aldeia	Maize stored in drum?						Total number of drums
	No			Yes			
	F	M	Total	F	M	Total	
Afabubu	**3**	**13**	**16**	**5**	**41**	**46**	**62**
Dalari	3	13	16	3	30	33	49
jefaliu				2	11	13	13
Baricafa	**4**	**17**	**21**	**6**	**40**	**46**	**67**
Afaia	3	8	11	1	18	19	30
Sarelari		4	4	3	12	15	19
Ussufassu	1	5	6	2	10	12	18
Cotamutu	**2**	**1**	**3**	**3**	**24**	**27**	**30**
Buanomar					3	3	3
Etanisi	1		1	1	3	4	5
Ouroma	1	1	2	2	18	20	22
Lacawa	**2**	**26**	**28**	**2**	**36**	**38**	**66**
Borugae	2	8	10	2	6	8	18
Boruvali		4	4		8	8	12
Oneraba		14	14		22	22	36
Luro	**4**	**25**	**29**	**10**	**77**	**87**	**116**
Abere	2	2	4	5	42	47	51
Alahira		2	2		4	4	6
Amahira	2	13	15	3	18	21	36
Hailarino		8	8	2	13	15	23
Wairoque		**2**	**2**		**6**	**6**	**8**
Luto					5	5	5
Lutoro		2	2		1	1	3
Total	**15**	**84**	**99**	**26**	**224**	**250**	**349**
% of total drums			28.4%			71.6%	100%

There were proportionally more empty drums held by women than by men (37% for women vs. 27% for men).

For the drums that currently did not hold maize, the respondents were asked if maize had been stored in the drum before, and what the drum was used for now.
Table 6 shows that 18% of the drums without maize (or 5% of the total number of drums on the farms) had held maize before, and 8% of the drums were used to store rice. None of the drums encountered during the survey was used to store water.

Table 6: Content of drums without maize during the survey

Suco and Aldeia	**Was maize stored in the drum before?**						**Total number of drums without maize**
	Don't know	**No** *Current use*				**Yes** *Now empty*	
		Empty	**Rice**	**Other**	**Total**		
Afabubu		**10**			**10**	**6**	**16**
Dalari jefaliu		10			10	6	16
Baricafa		**17**		**1**	**18**	**3**	**21**
Afaia		**10**			**10**	1	11
Sarelari		3		1	4		4
Ussufassu		4			4	2	6
Cotamutu		**3**			**3**		**3**
Buanomar							
Etanisi		1			1		1
Ouroma		2			2		2
Lacawa		**22**	**2**		**24**	**4**	**28**
Borugae		6	2		8	2	10
Boruvali		4			4		4
Oneraba		12			12	2	14
Luro	**1**	**18**	**4**	**1**	**23**	**5**	**29**
Abere	1			1	1	2	4
Alahira		1			1	1	2
Amahira		10	4		14	1	15
Hailarino		7			7	1	8
Wairoque			**2**		**2**		**2**
Luto							
Lutoro			2		**2**		2
Total	**1**	**70**	**8**	**2**	**80**	**18**	**99**
Percentage		71%	8%	2%	81%	18%	100%

The distribution of the 70 drums which are currently empty and not used for another purpose is shown in Table 7. Most of the empty drums were with farmers who had 2, 3 or 4 drums on their farm.

Figure 6 shows two empty drums on a farm in suco Afabubu. The farmer had four drums, two of which were empty (most likely the ones in the picture). One drum was full, and the other one was half full.

Figure 6: Two empty drums and an empty silo, suco Afabubu

Table 7: Location of empty drums not yet used for maize storage

Suco and Aldeia	Number of drums onsite with respondent						Total # of drums not yet used for maize storage
	1	2	3	4	5	8	
Afabubu		**2**	**2**	**4**	**2**		**10**
Dalari jefaliu		2	2	4	2		10
Baricafa	**1**	**5**	**6**	**5**			**17**
Afaia		2	6	2			10
Sarelari		3					3
Ussufassu	1			3			4
Cotamutu	**2**	**1**					**3**
Buanomar							
Etanisi	1						1
Ouroma	1	1					2
Lacawa	**1**	**3**	**2**	**10**		**6**	**22**
Borugae		2		4			6
Boruvali	1	1		2			4
Oneraba			2	4		6	12
Luro		**7**		**11**			**18**
Abere							
Alahira		1					1
Amahira		6		4			10
Hailarino				7			7
Wairoque							
Luto							
Lutoro							
Total	**4**	**18**	**10**	**30**	**2**	**6**	**70**

Table 8 shows the same information in a different way, indicating how many of the drums on the farms were empty.

Table 8: Number of empty drums by number of drums onsite

		Number of drums onsite					
		1	**2**	**3**	**4**	**5**	**8**
Number of empty drums	**1**	4	6		1		
	2		6	2	6	1	
	3			2	3		
	4				2		
	6						1

It seems that it are mostly the farmers who have bought two and four drums who have empty drums.

3.3 Amounts of Maize stored in Drums

There were in total 250 drums filled to various degrees with the farmers visited as part of this survey. Most of these drums (82%) were between two-thirds and completely full, 12% were between one-third to two-thirds full, and 5% of the drums were up to one-third full (see Table 9).

Figure 7: Five well-protected drums, all full with maize, in suco Baricafa (left), and a drum full of maize in suco Afabubu (right)

Table 9: Amounts of maize stored in the drums

Suco and Aldeia	Extent to which the drums are filled with maize									Total # of drums with maize
	Bottom third			Middle third			Top third			
	F	M	Total	F	M	Total	F	M	Total	
Afabubu		**2**	**2**	**2**	**9**	**11**	**3**	**30**	**33**	**46**
Dalari		2	2		7	7	3	21	24	33
jefaliu				2	2	4		9	9	13
Baricafa		**3**	**3**		**6**	**6**	**6**	**31**	**37**	**46**
Afaia		1	1		2	2	1	15	16	19
Sarelari		1	1				3	11	14	15
Ussufassu		1	1		4	4	2	5	7	12
Cotamutu		**2**	**2**		**4**	**4**	**3**	**18**	**21**	**27**
Buanomar					2	2		1	1	3
Etanisi		1	1		1	1	1	1	2	4
Ouroma		1	1		1	1	2	16	18	20
Lacawa	**1**	**1**	**2**		**1**	**1**	**1**	**34**	**35**	**38**
Borugae	1	1	2				1	5	6	8
Boruvali								8	8	8
Oneraba					1	1		21	21	22
Luro	**1**	**3**	**4**	**3**	**5**	**8**	**6**	**69**	**75**	**87**
Abere	1		1	1	2	3	3	40	43	47
Alahira								4	4	4
Amahira		2	2	1	2	3	2	14	16	21
Hailarino		1	1	1	1	2	1	11	12	15
Wairoque					**1**	**1**		**5**	**5**	**6**
Luto					1	1		4	4	5
Lutoro								1	1	1
Total	**2**	**11**	**13**	**5**	**26**	**31**	**19**	**187**	**206**	**250**
% of drums with maize			5.2%			12.4%			82.4%	100%

All stored maize was reportedly of good quality.

3.4 Poorly Located Drums

Of the 349 drums, only 11 (3.2%) were poorly located (Table 10).

Even this number may be a bit exaggerated as illustrated by the two drums shown in Figure 8, which were categorised as being 'unprotected from the weather'.

Figure 8: A pair of drums in suco Lacawa, aldeia Oneraba, that were categorised as 'unprotected from the weather'

Table 10: Poorly located drums

Suco and Aldeia	Type of poor location			Total # of poorly located drums
	In contact with ground	Unprotected from weather	Other bad location	
Afabubu	**1**	**1**		**1**
Dalari	1	1		1
Baricafa	**1**			**1**
Afaia	1			1
Cotamutu	**1**			**1**
Ouroma	1			1
Lacawa	**1**	**3**	**1**	**3**
Borugae	1	1	1	1
Oneraba		2		2
Luro	**5**			**5**
Alahira	1			1
Amahira	4			4
Total	**9**	**4**	**1**	**11**

3.5 Drums in Poor Condition

Similarly, during the survey, there were very few cases of drums in poor condition. Of the 349 drums, only 2 (0.6%) missed a screwcap or had the top cut off (Table 11).

Table 11: Drums in poor condition

Suco and Aldeia	Type of poor condition		Total # of poor condition drums
	No screw-cap	Top lid of drum cut	
Afabubu		**1**	**1**
Dalari		1	1
Cotamutu	**1**		**1**
Ouroma	1		1
Total	**1**	**1**	**2**

3.6 Filling of Drums with Maize

As explained in section 2.2, the survey was conducted with two types of questionnaires:

- The short questionnaire, answered by 77 respondents, which focused exclusively on the drums and their contents;
- The long questionnaire, answered by 71 respondents, which asked all the questions of the short questionnaire, but with additional questions on filling and emptying the drums, the maize varieties cultivated, and the use of shellers and grinders.

Table 12 shows in which sucos and aldeias these 71 respondents were located, and the numbers of drums they have.

The question on "Who fills the drums with maize?" was the first question that was specific to the long questionnaire.

Table 12: Number of respondents for the 'long' questionnaire, and their number of drums

Suco and Aldeia	number of respondents	# of drums onsite	# of respondents with # of drums				
			0	1	2	3	4
Afabubu	**9**	**27**	**1**		**2**	**1**	**5**
Dalari	8	23	1		2	1	4
Jefaliu	1	4					1
Baricafa	**15**	**31**		**6**	**5**	**1**	**3**
Afaia	7	14		2	4		1
Sarelari	3	8		1		1	1
Ussufassu	5	9		3	1		1
Cotamutu	**9**	**11**		**7**	**2**		
Buanomar	1	1		1			
Etanisi	2	2		2			
Ouroma	6	8		4	2		
Lacawa	**10**	**27**		**1**	**5**		**4**
Borugae	3	8			2		1
Boruvali	2	6			1		1
Oneraba	5	13		1	2		2
Luro	**25**	**62**		**3**	**13**	**3**	**6**
Abere	11	30			6	2	3
Alahira	1	4					1
Amahira	9	18		2	6		1
Hailarino	4	10		1	1	1	1
Wairoque	**3**	**5**		**2**		**1**	
Luto	2	2		2			
Lutoro	1	3				1	
Total	**71**	**163**	**1**	**19**	**27**	**6**	**18**

Figure 9: New and old drums in suco Luro, all full with maize

Of the 71 respondents who were asked who in the household fills the drums with maize, 66 provided an answer on this question (Table 13).

Table 13: Filling of drums with maize (N=66)

Wife	Husband	Girls	Boys	Other
55	51	22	18	5
83%	77%	33%	27%	8%

If we ignore 'Other' there is information from 62 households on who fills the drums with maize. This information is presented visually in Figure 10. It shows that it are predominantly the 'wife and husband' teams who fill the drums, with the whole household (wife, husband, boys, girls) coming second.

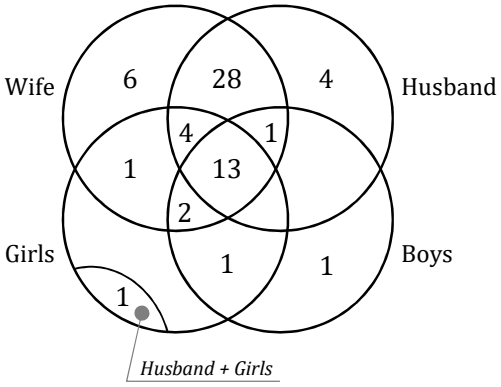

Figure 10: Who in the household fills the drums with maize

Figure 11: Panoramic view in the Raumoco watershed area

3.7 Taking out Maize from the Drums

Sixty-three respondents provided information on who is involved in taking out maize from the drums (Table 14).

Table 14: Taking out maize from the drums (N=63)

Wife	Husband	Girls	Boys	Other
45	33	21	15	11
71%	52%	33%	24%	17%

There was some confusion with the answer to this question, in the sense that some respondents named one or more household members being involved in taking out maize from the drums, whereas, for another question, they stated that no maize has been taken out of the drums so far. For some respondents, the answer to the question on "Who takes out maize from the drum?" is therefore more a reflection of intent than of reality.

Ignoring 'Other' persons, there is data from 53 households on who takes out maize from the drums (Figure 12). Comparing to filling the drums, taking out maize from the drums is more a job for adults; the category 'wife and husband' is by far the largest of the combinations. It also is a task which involves the female members of the household more than the male members.

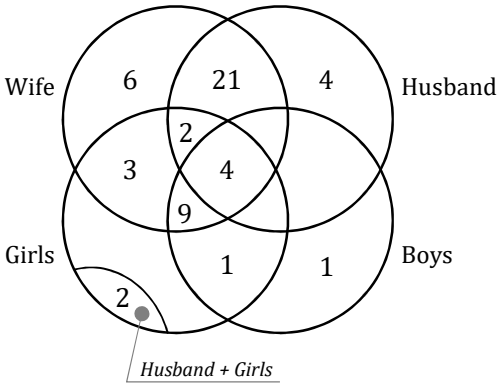

Figure 12: Who in the household takes out maize from the drums

3.8 Frequency of Taking Maize out from the Drum

The respondents were asked "In the last month, how often was maize taken out of the drums?". Table 15 shows information on how often this happend. The main tendencies seem to be to either use the drums for long-term storage, and not to open them, or to take out enough maize to meet the maize requirements for a week.

Table 15: Frequency of taking maize out from the drum (N=71)

Daily	Weekly	Monthly	Never
6	**25**	**6**	**34**
8%	35%	8%	48%

Table 16 shows the frequency of taking out maize from the drums in relation to the number of drums the respondents have. The number of drums does not seem to influence the 'take-out' frequency.

Figure 13: A woman farmer takes out maize from a drum, using a can with a string attached and a stick, to push the can into the maize

Table 16: Frequency in taking maize out from the drum, by number of drums onsite

# of drums onsite with respondent	Frequency of taking out maize from the drum				Total
	Daily	Weekly	Monthly	Never	
0				1	1
1		7	2	10	19
2	2	9	2	14	27
3		4	1	1	6
4	4	5	1	8	18
Total	**6**	**25**	**6**	**34**	**71**

3.9 Manner in which Maize is stored

Of the 71 respondents of the long questionnaire, 62 (87%) stored maize in their metal drums, and 43 of these 62 respondents (70%) stored maize only in yellow drums (Table 17).

Table 17: Manner of storing maize (N=71)

Drums	Sacks	Above fireplace	Other method
62	**17**	**2**	**4**
87%	24%	3%	6%

No respondents stored maize in plastic drums, used the traditional method of hanging it up in a tree or store it in a traditional barn (*bouleten*), and none had sold his or her maize harvest.

Figure 14: Suco Cotamutu. The farmer had two drums full with maize, with excess maize stored in a sack. The white sack on the bench on the left is rice.

There were 23 respondents who either did not store maize in their drums, or stored maize in drums but also used another method of storage. The question here is: did the farmers use other storage methods because they had not enough drums? Or were some of the drums not fully used?

Table 18: Check on other manners of storing maize

All drums used, and extra maize	Some drums used, some empty, and other manner of storage	All drums empty and other manner of maize storage
17[1]	3	3

Table 18 shows that the main reason farmers used other ways of storing maize beside using the metal drums was that they had harvested more maize than they could store in their drums.

[1] This includes one farmer who used his two drums to store rice and who stored his maize differently, and one farmer who used one of his four drums to store beans.

3.10 Growing Maize

In the 2014-2015 season, 65 of the 71 farmers who were interviewed more extensively had grown maize. Of these 65, 36 (55%) were able to give the right name of the maize variety they had received (Table 19).

Table 19: Number of respondents who know the maize variety name

Variety correctly named			Yellow	Wrong name	No answer / Don't know
Respondent knows variety name	Sele	Noi Mutin			
36	35	2	2	1	23

Of the 65 farmers, 62 said that they had received a bottle or pack of maize seed with the drum; 60 of them had planted the seed, one respondent had not planted it because the seed was apparently bad, and one woman respondent didn't know whether that seed had been planted or not.

All 60 farmers who had planted the received improved seed had planted all of it (except for one respondent who had only used part of it, because it was more seed than he needed for his plot). Table 20 shows that, of the farmers who had access to improved maize varieties, roughly half of them planted only the improved variety, and half of them planted both the improved and local varieties.

Table 20: Type of maize variety cultivated by the respondents

Maize varieties cultivated in 2014-2015	Number of farmers	Percentage of farmers
Sele / Noi Mutin	29	45%
Sele /Noi Mutin + local variety	30	46%
Local variety	4 (*)	6%
Don't know	2	3%
Total	**65**	**100%**

(*) Included in this group are the three farmers who reportedly had not received a bottle or pack of improved maize seed.

3.11 Buying Maize Seed

The 71 respondents of the long questionnaire were asked if, in the last two years, they had ever bought maize seed. Only three farmers (4%) had done so. Farmers thus still mostly rely on their own seed stocks, or perhaps hope to receive seed for free, from the government or from relatives.

The follow-up question was "Would you be willing to buy improved maize seed at $ 1.50 per kg?". Here only four farmers (6%) said 'Yes', including two of the three farmers who had bought seed in the last two years.

3.12 Maize Shellers

The respondents were asked if they had received or bought a large or small maize sheller (Figure 15).

Figure 15: Maize shellers

Of the 65 respondents who were asked this question, only 11 farmers (17%) had a sheller. Ten farmers had a small hand sheller, and eight had a larger sheller, Seven of these eight farmers also had a hand sheller.

As for the use of the shellers, they had generally been used; only one large sheller and two hand shellers had not been used, and these two hand shellers were held by farmers who also had a large sheller.

3.13 Shelling of the Maize

The maize from the last harvest had been shelled by all but three of the 65 farmers who answered this question, and 55 of these 62 (89%) had shelled all their maize. The maize shelling is most often not done in one go; 58 of the 62 farmers (94%) had shelled the maize at different times. Of the four farmers who had done it all at once, two had one full drum, one had half a drum, and the fourth farmer had kept his maize in sacks instead of using his drum (but he had used a large sheller to do the job).

Maize shelling was still done predominantly by hand. Figure 16 shows that 52 of 62 farmers (84%) shelled their maize by hand. What is a little strange is that the one farmer who had both a large and small sheller but did not use these shelled all his maize by hand, and he had four drums full of maize, and additional maize stored in sacks.

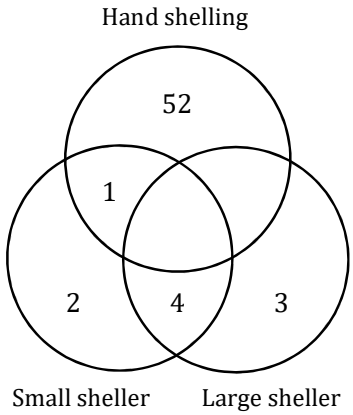

Figure 16: Manner of shelling the maize

Two of the three farmers who used a large sheller also had a small sheller but did not use this.

Table 21 and Figure 17 shows who in the household shelled the maize[2]. It shows that maize shelling is mostly done by more than one household member, and this is still largely the case if they have shellers (the three exceptions were a male farmer who shelled all using a large sheller, and two female farmers who used small shellers).

Table 21: Shelling of the maize (N=62)

Wife	Husband	Girls	Boys	Other
58	52	37	33	5
94%	84%	60%	53%	8%

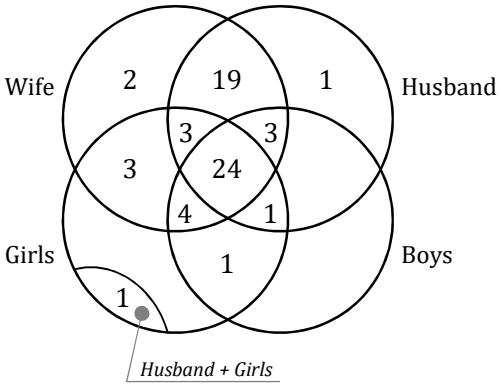

Figure 17: Who in the household shells the maize

Table 21 and Figure 17 also show that the female household members are more involved in the shelling of the maize than the male household members.

[2] In Figure 17, the 'other' have been ignored. There were no cases where only 'other' shelled the maize.

Some more pictures of drums, to round off the report.

Figure 18: Drums, drums, drums