

Community Participation in the Local Rice Security Programs in Cailaco and Maliana Sub-Districts in Timor-Leste

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ABSTRACT. This study was conducted to analyze the factors affecting community participation in the rice security programs in Cailaco and Maliana, Timor-Leste in 2015. Respondents were 103 farmer-members randomly selected from seven farmer groups who worked in the rice programs. Socio-demographic and economic characteristics of the farmers were gathered. Primary data were collected using a structured survey questionnaire, supplemented with data from key informant interviews and focus group discussions. Secondary data were collected from government institutions and donor agencies. Results of the study show that farmers in Cailaco and Maliana have a mean age of 44 years. They have been farming for about 20 years and members of farmers' group for four years. They have an average farm size of 2 ha with two parcels used for farming. They have very favorable attitude toward joining farmers' groups and very high trust toward co-farmers and farmers' group. Using binary logistic regression, results show that the farmers were fully involved from project identification, planning, implementation, and up to monitoring and evaluation. It also reveals the socio-economic factors that affected the respondents' participation in the different phases of the programs. Year of membership in farmers' group and trust in co-farmers significantly affected problem identification. Household size, adequate income for family support, and year of membership in farmers' group affected planning; age and financial resources were related to implementation; and age affected monitoring and evaluation.

Keywords: *rice security, community participation, rice shortage, level of participation*

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INTRODUCTION

Timor-Leste has been largely dependent on agricultural production since its independence restoration in 2002. About one-third of its national gross domestic product came from agriculture, the source of income of majority of the population (Correia, Janes, Rola-Rubzen, Freitas, & Gomes, 2009). Within the agricultural sector, rice production has gained an increasing importance because of the rising domestic demand for rice. The Ministry of Agriculture and Fisheries (MAF, 2008) reported that the local demand reached 77,200 tons annually at 90 kg per capita. This is higher by about 50,000 tons than the local production that is 27,000 tons of milled rice, equivalent to 45,000 tons of paddy at 60 percent milling efficiency (Food and Agriculture Organization [FAO], 2003).

Among the 13 districts in Timor-Leste, the Bobonaro district ranked first in terms of percentage contribution to national rice production. Its rice production area totalled 5,004 ha, contributing 21 percent to the national production (MAF, 2008). Although rice is more expensive compared to its substitutes, it has become the main staple food of almost 60 percent of about 864,000 people in Bobonaro, with substitute foods such as corn, cassava, and potatoes for the rest of the population. Bobonaro was the most productive district for rice and maize with an average yield of 2 tons/ha per cropping (Adelino & Mahinda, 2006).

The domestic demand for rice continued to increase as average income per capita increased over time (Adelino & Mahinda, 2006). The Timor-Leste government had to import rice to overcome the shortage of 4,000 tons of rice per month, according to FAO (2003). MAF (2008) also estimated rice imports at 78,000 tons x \$750/ton (2008 prices) = US\$58.5 million annually to address the gap on rice demand as well as the need for cross-substitution for other staple foods. With the continuous rise of food prices in the world market, the government encouraged farmers to produce more rice and prioritize investment in the rice sector. It has adopted programs to increase domestic rice production.

The country's Strategic Development Plan (SDP) 2011–2030 emphasized the contribution of community participation in the development of sustainable program for rice security in the country. However, the Asia Foundation (2013) and Irish Aid Report (2013) stressed the weakness of community involvement in project identification at village level. There is a need to determine why a low level of community

participation has been observed and reported. Community participation according to Mitchell (1999), as cited in Sharma and Deepak (2001), means stakeholders' involvement in planning, decision-making, and evaluation.

In this light, this study was conducted to analyze the community participation in the rice security programs in Cailaco and Maliana, Timor-Leste. Specifically, the study aimed to: 1) describe the socio-demographic and economic characteristics of the participants of the programs in the study villages; 2) determine the level of community participation in the different phases of the programs; and 3) analyze the factors affecting community participation in the program.

There are two rice security programs in the study areas: IMPACT (Improve Marketing Production through Agricultural Cooperative in Timor-Leste) and Centro Desenvolvimento Comunitario which were established by the Ministry of Agriculture and Fisheries (Seed of Life, 2012).

IMPACT started in 2013 and is expected to be completed by 2019. The objectives of the program are to: 1) introduce to the farmers the SRI so that farmers can apply in their own farm and maximize cost in agriculture; 2) train farmers' cooperative in management of small scale business to maximize benefits from SRI and seeds diversification and help farmers to have access to government support; 3) improve food security for households and increase income in eight districts of Timor-Leste; and 4) provide access to market and bring farmers' agricultural products and compete in the market. The program components are System of Rice Intensification, food processing, and market access.

The Centro Desenvolvimento Comunitario was established in 2013 and is expected to finish in 2017. It aims to: 1) enhance farmers' capacity in problem analysis; 2) improve farmers' capacity through training, field visit and exposure visits; 3) enhance farmers' network through the provision of regular information about agriculture issues and policies; and 4) provide agricultural facilities particularly in seed distribution to farmers. The program components include evaluation of improved food crop varieties, seed production and distribution, construction of irrigation system, and training and information.

METHODOLOGY

Conceptual Framework

Community participation is an essential element of any community-based development program. In the general context of rural development programs in Timor-Leste, community participation involves the major stakeholders and responsible actors of development including individuals, households, and community members. In the case of the rice security programs, households and farmers' groups are involved in the different phases of the programs such as project identification, planning, implementation, and monitoring and evaluation. As major stakeholders, members of farmers' groups should be described in terms of their socio-demographic characteristics, namely: age, number of years of organizational membership, household size, farming experience, attitude toward joining farmers' group, trust in co-farmers, and trust in farmers' groups.

In addition, the economic characteristics such as farm size, land parcel used for farming, rice production income, household income, and financial resources of the farmers' groups are important factors to consider. The relationship between the respondents' socio-economic characteristics (independent variables) and their participation in the different phases of the rice security programs (dependent variable) is shown in Figure 1.

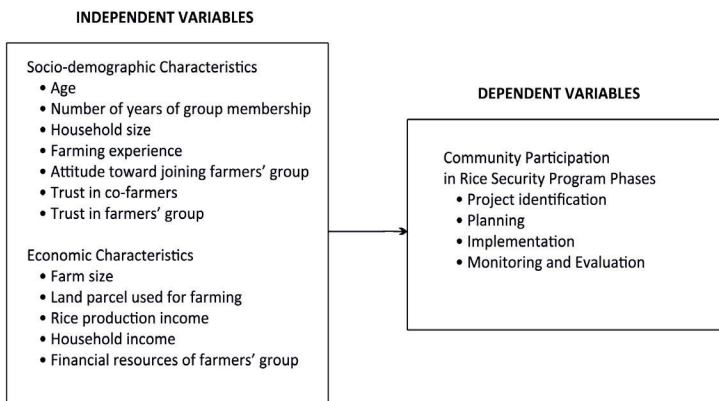


Figure 1. Conceptual framework of the study

Location and Time of Study

The study was conducted in January-February 2015 in Bobonaro district, one of the 13 administrative districts in Timor-Leste. Bobonaro district is located at the western district of the country. It is comprised of six sub-districts, namely: Atabae, Balibo, Bobonaro, Cailaco, Lolotoi, and Maliana. Among these sub-districts, Maliana and Cailaco were purposively selected for this study because these are the primary rice-growing areas in the Bobonaro district.

The study covered specifically three villages in Maliana (Holsa, Odomau, and Ritabou) and two villages in Cailaco (Purugua and Marco). Selection was based on the following criteria: 1) rice production is the primary source of income, 2) lowland rice production is practiced, and 3) the community members are involved in local cooperatives or community-based organizations.

Data Gathering and Analysis

Primary data were gathered from the farmers with the use of a structured survey questionnaire. Information gathered were supplemented with data from the key informant interviews (KIIs) and focus group discussions (FGDs). The KIIs were conducted with community leaders, extension workers and key officers of the *Movimentu Cooperativa Economia e Agricola* (MCE-A) and the Department of Agricultural Extension of Bobonaro district, and other stakeholders. The FGDs involved the participation of 8-12 farmers, local leaders, and other members not included in the household survey.

Secondary data were collected from the institutions and donor agencies namely, Food and Agriculture Organization, Seed of Life, and Department of Agriculture of MAF. Review of documents such as annual reports, project evaluation report, official records, and research papers was done.

Data analysis involved the use of the Statistical Package for the Social Science (SPSS). Descriptive statistics such as frequency distribution, percentage, and mean was applied. Furthermore, the binary logistic regression was used to assess the factors affecting community participation in the rice security programs.

Table 1. Respondents' socio-demographic characteristics

PARTICULARS	CAILACO (n=46)		MALIANA (n=57)		TOTAL (n=103)	
	No.	%	No.	%	No.	%
Age (years)						
30 and below	10	9.7	7	6.8	17	16.5
31-40	12	11.7	7	6.8	19	18.5
41-50	9	8.7	25	24.3	34	33.0
51-60	13	12.6	13	12.6	26	25.2
61 and above	2	1.9	5	4.9	7	6.8
Range	18 -61		20 – 66		18 - 66	
Mean	42.39		45.77		44.26	
Length of group membership (years)						
1-2	7	6.8	13	12.6	20	19.4
3-4	23	22.3	23	22.3	46	44.7
5-6	16	15.5	13	12.6	29	28.1
7-8	0	0	8	7.8	8	7.8
Range	1-6		1-8		1-8	
Mean	4.00		3.95		3.97	
Household size						
1-5	26	25.2	27	26.2	53	51.4
6-10	20	19.4	27	26.2	47	45.6
11-15	0	0	3	2.9	3	2.9
Range	3-10		3-12		3-12	
Mean	5.83		6.003		5.92	
Farming experience (years)						
1-10	14	13.6	11	10.7	25	24.3
11-20	14	13.6	25	24.3	39	37.9
21-30	12	11.6	13	12.6	25	24.2
31-40	5	4.9	4	3.9	9	8.7
41-50	1	0.9	4	3.9	5	4.9
Range	2-50		3-50		2-50	
Mean	20.93		18.74		19.71	

RESULTS AND DISCUSSION

Respondents' Socio-demographic Characteristics

The respondents were generally in their prime age with a mean of 44 years. Only 16 percent of them were aged 30 years and younger, and 18 percent belonged to the age group 31-40 years old. Adults or those who belonged to age groups of 41-50 and 51-60 years old composed 33 percent and 25 percent of the respondents, respectively. Lastly, only seven percent of them were elders or 61 years old and above (Table 1).

In terms of length of organizational membership, slightly less than half (45%) of the respondents had three to four years, 28 percent had five to six, 19 percent had one to two years, and about 8 percent had been members for seven to eight years.

On household size, the families were relatively large comprised of 3 to 12 members with an average size of six. This shows that families are largely extended families.

On farming experience, 38 percent of farmer-respondents had been farming for 11 to 20 years, while 24 percent had been farming for 1-10 and 21-30 years, with a mean of almost 20 years.

Farmers' Attitudes and Trust in Co-farmers and their Organization

To determine the farmers' attitude toward joining a farmers' group and trust in co-farmers and in their group, the respondents were asked to answer statements using a three-point scale assigned with a numerical value of 1 for disagree, 2 for undecided, and 3 for agree. Adjectival rating of the attitude was based on the following scale: 1.00-1.66 = unfavorable, 1.67-2.33 = favorable, and 2.34-3.00 = very favorable. The adjectival rating for trust was based on the scale of 1.00-1.66 = low, 1.67-2.33 = moderate, and 2.34-3.00 = high. Table 2a shows that in general, the respondents had very favorable attitude toward joining farmers' groups. All of them were members of farmers' groups.

Tables 2b and 2c show that the farmers, as a community, had a strong social capital based on their high score on trust in co-farmers and trust in their farmers' group. The farmers believed that their co-farmers in their village can be trusted and will provide help if they ask for assistance. Likewise, respondents were confident that their farmers' group will help them in times of need. They see the officers of their farmers' group as trustworthy.

Table 2a. Farmers' attitudes towards joining farmers' groups

STATEMENT	AGREE		UN-DECIDED		DIS-AGREE		WMS ^a	ADJECTIVAL RATING ^a
	No.	%	No.	%	No.	%		
If farmers join the farmers' group, the family and community will benefit more.	98	95.1	5	4.9	-	-	2.95	Very favorable
Farmers should attend group meetings regularly.	98	95.1	5	4.9	-	-	2.95	Very favorable
It is important to interact with other members of the farmers' group.	100	97.1	3	2.9	-	-	2.97	Very favorable
The farmers' group should create activities that can improve rice security in the village.	100	97.1	3	2.9	-	-	2.97	Very favorable
I will attend group meetings or interact with other members of the farmers' group to benefit from other activities.	96	93.2	7	6.8	-	-	2.93	Very favorable
							2.95	Very favorable

^aWMS (weighted mean score) and Adjectival Rating:
 1.00 – 1.66 = Low; 1.67– 2.33 = Moderate; 2.34 – 3.00 = High

Table 2b. Farmers' trust in co-farmers

STATEMENT	AGREE		UN-DECIDED		DIS-AGREE		WMS ^a	ADJECTIVAL RATING ^a
	No.	%	No.	%	No.	%		
If I need help, I am sure that my co-farmers would help me.	64	62.1	39	37.9	-	-	2.62	High
I can totally trust other farmers in our village.	76	73.8	27	26.2	-	-	2.74	High
I can trust most members in the farmers' group.	77	74.8	26	25.2	-	-	2.60	High
In times of need, I can ask for help from other farmers in our village.	83	80.6	20	19.4	-	-	2.80	High
If I were to leave my family, I would entrust its protection to my co-farmers.	63	61.2	32	31.1	8	7.8	2.53	High
							2.66	High

^aWMS (weighted mean score) and Adjectival Rating:
1.00 – 1.66 = Low; 1.67– 2.33 = Moderate; 2.34 – 3.00 = High

Table 2c. Farmers' trust in the farmers' group

STATEMENT	AGREE		UN- DECIDED		DIS- AGREE		WMS ^a	ADJECTIVAL RATING ^a
	No.	%	No.	%	No.	%		
If I need help, my group would provide me assistance.	89	86.4	14	13.6	-	-	2.86	High
I can trust my group to help me improve my performance in rice production.	96	93.2	5	4.9	2	1.9	2.91	High
I can trust the officers of my farmers' group.	95	92.2	8	7.8	-	-	2.92	High
In times of need, I can ask for help from the officers of my farmers' group	98	95.1	5	4.9	-	-	2.95	High
If I were to leave my family, I would entrust its protection to my group.	95	92.2	8	7.8	-	-	2.92	High
							2.91	High

^aWMS (weighted mean score) and Adjectival Rating:
 1.00 – 1.66 = Low; 1.67– 2.33 = Moderate; 2.34 – 3.00 = High

Economic Characteristics of Farmer-Respondents

Majority (77%) of the respondents had 1-2 ha of rice farms. Similarly, majority (79%) of the farmer-respondents from both sub-districts had 1-2 parcel/s of land used for farming (Table 3).

In terms of major sources of income, the respondents were primarily engaged in rice farming and other activities such as poultry and vegetable and livestock production (Figure 2). Income from rice production ranged from US\$10 to US\$180 per month. Majority (78%) of the respondents from Cailaco and more than half (56%) from Maliana reported the lowest monthly income within US\$10-66 range (Table 3).

The monthly household income of the respondents, which ranged from US\$65 to US\$742. Majority of respondents in both sub-districts recorded a monthly farm income ranging from US\$65 to US\$290. Only one was recorded in Cailaco with a monthly income of US\$291-516, while in Maliana one had the highest monthly farm income falling within the range of US\$517-742 (Table 3).

Overall, about 44 percent of the farmer-respondents stated that their group have financial resources, which mostly came from group contributions. The financial resources ranged from US\$751 to US\$1150, according to some respondents (16%), while others (15.5%) said that their resources amounted from US\$750 and below (Table 4).

Rice Security Status in the Study Villages

Rice security in the study villages was determined using rice availability, rice accessibility, and rice utilization as indicators. Rice availability refers to the availability of rice to the respondents based on the following criteria: 1) whether the respondents experienced rice shortage before joining the farmers' groups, 2) sufficiency of rice production since involvement in the farmers' groups, and 3) level of sufficiency of rice production categorized as enough, more than enough, sometimes enough, and not enough. Meanwhile, rice accessibility refers to the respondents' access to rice and their alternative courses of action in case there is rice shortage. Lastly, rice utilization refers to the respondents' utilization of rice as a staple food, sale of rice as source of family income, and preference for other food over rice.

Table 3. Respondents' economic and farm characteristics

PARTICULARS	CAILACO (n=46)		MALIANA (n=57)		TOTAL (n=103)	
	No.	%	No.	%	No.	%
Total area of rice farm (ha)						
1-2	37	35.9	42	40.8	79	76.7
3-4	9	8.7	12	11.7	21	20.4
5-6	0	0	3	2.9	3	2.9
Range	2.00		1.85		1.91	
Mean	1-6		1-4		1-6	
Parcels of land for farming						
1-2	38	36.9	43	41.7	81	78.6
3-4	6	5.8	11	10.7	17	16.5
5-6	2	1.9	3	2.9	5	4.9
Range	1-6		1-4		1-6	
Mean	1.87		1.86		1.86	
Rice production income/month (US\$)						
10 – 66	36	78.3	32	56.1	68	66.0
67- 123	10	21.7	22	38.6	32	31.0
124 – 180	0	0	3	5.3	3	2.9
Range	10-150		20-180		10-180	
Mean	56.63		63.02		60.16	
Household income/month (US\$)						
65-290	45	97.8	54	94.7	99	96.1
291-516	1	2.2	2	3.5	3	2.9
517-742	0	0	1	1.8	1	1.0
Range	70 – 742		65 - 330		65-742	
Mean	186.87		160.98		172.50	

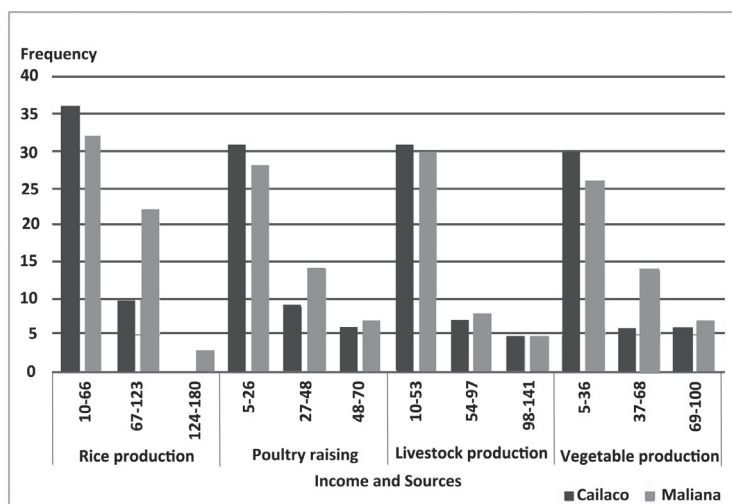


Figure 2. Farmer-respondents' major sources of income

Table 4. Farmer groups' financial resources

PARTICULARS	CAILACO (n=46)		MALIANA (n=57)		TOTAL (n=103)	
	No.	%	No.	%	No.	%
Financial resources						
With	22	21.4	23	22.3	45	43.7
Without	24	23.3	34	33.0	58	56.3
Amount of financial resources (US\$)						
750 and below	5	22.7	11	47.8	16	15.5
751 to 1150	12	54.5	5	21.7	17	16.5
1151 and above	5	22.7	7	30.4	12	11.7
Total	22	21.4	23	22.3	45	42.7
Sources of financial resources ^a						
Group contributions	32	31.1	45	43.7	77	74.7
NGO contributions	3	2.9	1	0.9	4	3.9
Individual contributions	3	2.9	-	-	3	2.9

^aMultiple response

In relation to rice availability, majority of the respondents (92%) experienced rice shortage. The shortage was highly experienced in 2007 (33%), 2004 (26%), and 2006 (23%). Rice shortage was experienced for as long as six months to as short as one month. More than half (53%) experienced rice shortage for three to four months; some (33%) experienced it for one to two months; and only a few (6%) mentioned five to six months (Table 5). The findings indicate that rice shortage is primarily caused by reasons beyond the control of the farmers. Infestation and long dry spell in 2004, 2006, and 2007, which had seriously affected rice farms brought about low yield, and therefore less amount of food for the household. These results are supported by the report of Da Costa et al. (2013) that Timor-Leste suffers from seasonal food insecurity. Weather changes and pest damage had grave consequences on rice production. However, rice production is more stable than maize and provides some food security for the household (Anderson & Cook, 1999).

The status of rice security in terms of rice accessibility in the study villages was improving. More than half of the respondents (53%) shared that the prevailing market price of rice is just enough, while the remaining 47 percent perceived it as low. To cope with rice shortage, respondents bought rice from the market (53%), borrowed from relatives (35%) or exchanged labor for rice (12%) (Table 5).

Rice security in terms of rice utilization was indicated in the respondents' consumption of rice and rice substitutes like maize and cassava, in case of rice shortage. In terms of number of meals per day, almost all (99%) mentioned that they had three meals a day. More than half (58%) stated that they consumed 1.5 to 2.0 kg of rice per day for a family of six (Table 6). This could be attributed to the big family size of an ordinary household in Timor Leste. As recorded, household size was mostly comprised of at least five to six members. This implies that a bigger quantity of rice is consumed especially those with extended families. The result fell within the national consumption of rice, which was 115 kg per year per person as reported by Seeds of Life (2013). This is equivalent to at least 0.31 kg per person per day consumption or at least six family members consumed 1.8 kg per day.

Several years before the study, Timor Leste has been food sufficient due to its annual rice importation. However, some rural households expressed food shortages when their rice and maize stocks have been consumed. In case of cereal shortage, root crop such as cassava and sweet potato are substituted. Another response to food shortage

Table 5. Status of rice security in the study sites according to rice availability and accessibility

PARTICULARS	CAILACO (n=46)		MALIANA (n=57)		TOTAL (n=103)	
	No.	%	No.	%	No.	%
Experience rice shortage						
Yes	39	37.9	56	54.4	95	92.3
No	7	6.8	1	0.9	8	7.7
Year when rice shortage was experienced ^a						
2002	1	0.9	2	1.9	3	2.9
2004	10	9.7	17	16.5	27	26.2
2005	1	0.9	0	0	1	0.9
2006	12	11.7	12	11.7	24	23.4
2007	13	12.6	21	20.4	34	33.0
2009	1	0.9	0	0	1	0.9
2010	6	5.8	2	1.9	8	7.8
2011	2	1.9	3	2.9	5	4.9
Number of months rice shortage was experienced						
1-2	20	19.4	14	13.5	34	33.0
3-4	19	18.4	36	35.0	55	53.4
5-6	0	0	6	5.8	6	5.8
Total	39	37.8	56	54.3	95	92.2
Range	2 – 3		3 -3		2 – 3	
Mean	2.98		3		2.97	
Causes of rice shortage ^a						
Long dry season	23	22.3	15	14.6	38	36.9
Insect attack	27	26.2	22	21.4	49	47.6
Absence of irrigation	5	4.9	1	1.0	6	5.8
Lack of farm workers	5	4.9	27	26.2	32	31.1
Political crisis	8	7.8	8	7.8	16	15.5

^aMultiple response

Table 5 Continued...

PARTICULARS	CAILACO (n=46)		MALIANA (n=57)		TOTAL (n=103)	
	No.	%	No.	%	No.	%
Level of rice sufficiency after joining farmers' group						
Enough	20	19.4	43	41.7	63	61.2
More than enough	24	23.3	9	8.7	33	32.0
Sometimes enough	2	1.9	5	4.8	7	6.8
Prevailing market price of rice						
Low	24	23.3	24	23.3	48	46.6
Just enough	22	21.4	33	32.0	55	53.4
Action to cope with rice shortage						
Bought from the market	4	3.9	5	4.8	9	8.7
Borrowed from relatives	3	2.9	3	2.9	6	5.8
Exchanged labor	1	1.0	1	1.0	2	1.9

Table 6. Status of rice security in the study sites according to rice utilization

PARTICULARS	CAILACO (n=46)		MALIANA (n=57)		TOTAL (n=103)	
	No.	%	No.	%	No.	%
Food staples ^a						
Rice	46	44.7	57	55.3	103	100.0
Maize	26	25.2	33	32.1	59	57.3
Cassava	23	22.3	38	36.9	61	59.2
Papaya	7	6.8	14	13.6	21	20.4
Banana	12	11.7	35	34.0	47	45.7
Potatoes	4	3.9	14	13.6	18	17.5
Beans	2	1.9	9	8.7	11	10.7
Wild food	6	5.8	8	7.8	14	13.6

^aMultiple response

Table 6 Continued...

PARTICULARS	CAILACO (n=46)		MALIANA (n=57)		TOTAL (n=103)	
	No.	%	No.	%	No.	%
Food substitutes during rice shortage ^a						
Maize	36	35.0	38	36.9	74	71.8
Cassava	30	29.1	33	32.1	63	61.2
Papaya	2	1.9	8	7.8	10	8.7
Banana	21	20.4	37	35.9	58	56.3
Potato	9	8.7	18	17.5	27	26.2
Beans	4	3.9	6	5.8	10	8.7
Wild food	13	12.6	30	29.1	43	41.7
Coconut	4	3.9	5	4.9	9	8.7
Sweet potato	7	6.8	3	2.9	10	8.7
Number of meals per day						
Two (2)	1	1.0	0	0	1	1.0
Three (3)	45	43.7	57	55.3	102	99.0
Estimated quantity of rice consumed/day/family (kg)						
0.5-1.0	6	5.8	10	8.7	16	15.5
1.5-2.0	30	29.1	30	29.1	60	58.2
2.5-3.0	6	5.8	12	11.7	18	17.5
3.5-4.0	4	3.9	4	3.9	8	7.8
4.5-5.0	0	0	1	0.9	1	0.9
Range	1 – 4		1 – 5		1 – 5	
Mean	2.06		2.05		2.05	

^aMultiple response

is for the adults to take one or two meals a day while the children are assured of two to three meals a day. Moreover, to augment food shortage, the farmers gather wild food from the forest and buy or borrow food from off-farm sources (Glazebrook, Lopes, Da Costa, & Ximenes, 2007).

Furthermore, most farmers in Timor-Leste produced one staple crop (rice or maize) or perhaps two (with cassava). Maize is the major crop for 83 percent of the farming households while rice is cultivated in lowland villages and is the most important crop for 13 percent of the Timorese farmers. Rice production is more stable than maize. However, cassava is less influenced by environmental factors and provides some food security if the harvest from rice and maize fails (Oxfam, 2007).

Rural people in Timor-Leste are basically involved in agriculture directly or indirectly. Hence, enhancing agricultural production is the best way to address poverty and food insecurity. To ensure food security, small-scale farmers should practice appropriate agricultural production technologies such as the use of high yielding varieties, soil fertility enhancers, and bio-fortification of staple crops, among others (Hazell & Diao, 2005).

Level of Community Participation in Rice Security Programs

Table 7 shows the level of community participation in rice security programs determined through the different phases of the program such as project identification, planning, implementation, and monitoring and evaluation. Respondents were asked to choose among five statements, which describe their level of participation in the different phases of the rice security programs. The rating scale used was low = 1-1.33; moderate = 1.34-2.66; and high = 2.67-4.0.

Overall, the mean score for participation in rice security programs was highest in project identification with a mean score of 3.7. In the planning phase, the highest mean score was in yearly planning (3.9), followed by problem analysis (3.7), goals/objectives setting (3.6), and rules and regulation crafting (3.1). For the implementation phase, the highest mean score was for implementation of the project activities (3.7), followed by setting up of the project organizational structure (3.6) and conduct of monthly meeting (3.4). Under the monitoring and evaluation phase, mean score for information for monitoring and evaluation was 3.7 while monitoring and evaluation activities got a mean score of 3.6. Based on the rating scale used in the study, there was high participation in all phases of the rice security programs.

Table 7. Level of participation in rice security program phases

RICE SECURITY PROGRAM PHASES	CAILACO	MALIANA	TOTAL
1. Project identification	3.2	3.8	3.7
2. Planning			
Problem analysis	3.6	3.8	3.7
Goals/Objectives setting	3.3	3.8	3.6
Rules and regulations crafting	2.9	3.3	3.1
Yearly planning	3.6	3.8	3.9
3. Implementation			
Conduct of monthly meeting	3.2	3.6	3.4
Setting up of the project organizational structure	3.2	3.5	3.6
Implementation of the project activities	3.6	3.7	3.7
4. Monitoring and Evaluation			
Monitoring and evaluation activities	3.7	3.6	3.6
Information for monitoring and evaluation	3.7	3.7	3.7

Rating scale: 1 – 1.33 Low; 1.34 – 2.66 Moderate; 2.67 – 4.0 High

In general, the data imply that the respondents were able to take part actively in the different phases of the rice security programs. The results indicate that the farmers were fully involved since project identification until monitoring and evaluation. Zoghy (1987) emphasized that organizations should put premium on enhancing the local people's participation. This can be realized by responding to their basic needs and allowing them to participate in the solution of their problems.

Factors Affecting Community Participation in the Rice Security Programs

The regression analysis as shown in Table 8 indicates that year of membership and trust in farmers' group, with odds ratio of 0.578918 and 17.76533, respectively, were found to have significant correlation with project identification phase of the rice security programs. This

Table 8. Regression analysis of respondents' participation in the project identification phase of the rice security programs and selected socio-economic variables

SOCIO-ECONOMIC VARIABLES	ODDS RATIO	P > z
Age	1.004289	0.921
Year of membership	0.578918	0.026*
Household size	0.901434	0.603
Farming experience	0.985808	0.751
Total area of rice farm (ha)	0.824691	0.791
Parcel of land used for rice farming	1.228747	0.771
Household income per month (US\$)	0.997065	0.464
Rice production income per month	0.979841	0.126
Financial resources of farmers' group	0.392561	0.099
Attitude towards joining farmers' group	5.864384	0.215
Trust in co-farmers	1.811430	0.222
Trust in farmers' group	17.765330	0.002*

*significant at 0.05% level

means that longer duration of membership ($p=0.036$) and presence of trust in farmers' groups ($p=0.002$) increase the probability that the farmers will participate fully in the project identification phase of the program.

For the planning phase, Table 9 summarizes the results of the regression analysis of the different planning activities and selected socio-economic variables. With respect to problem analysis, no variable was found significant based on the computed odds ratio. In terms of goals/objectives setting, years of membership with an odds ratio of 0.6722593 and total number of household size which recorded an odds ratio of 0.6773216 were significant variables. This indicates that the farmer-respondents who have been members of a farmers' group for a long time and have large families participate more in the planning activities. Long membership means commitment and loyalty to the farmers' group while a big family size serves as a motivation for the farmers to join farmers' groups for the benefits that they can derive such as attendance to training, free seeds, and other materials.

Table 9. Regression analysis of participation in the planning phase of rice security programs and selected socio-economic variables

SOCIO-ECONOMIC VARIABLES	PROBLEM ANALYSIS		GOALS/ OBJECTIVES SETTING		RULES AND REGULATIONS CRAFTING		YEARLY PLANNING	
	Odds Ratio	P> z	Odds Ratio	P> z	Odds Ratio	P> z	Odds Ratio	P> z
Age	1.032522	0.385	1.03998	0.278	1.007900	0.766	0.981153	0.590
Year of membership	0.767356	0.187	0.672259	0.049*	0.940613	0.668	0.956976	0.826
Household size	1.103091	0.539	0.677322	0.030*	0.947353	0.649	1.291306	0.145
Farming experience	0.945035	0.132	1.011362	0.769	0.999848	0.995	1.015340	0.684
Total area of rice farm (ha)	0.405715	0.225	0.534265	0.400	0.499173	0.338	3.415518	0.567
Parcel of land used for rice farming	2.676994	0.182	2.180733	0.293	1.376714	0.654	0.538253	0.776
Household income per month (US\$)	0.997654	0.479	0.997427	0.483	1.006677	0.102	1.008283	0.169
Rice production income per month	0.985862	0.194	1.021627	0.247	1.007978	0.463	0.989929	0.506
Financial resources	0.667638	0.530	0.630937	0.464	0.524358	0.174	0.519103	0.309
Attitude towards joining farmers' group	5.468954	0.148	1.169862	0.947	1.035985	0.975	11.131550	0.085
Trust in co-farmers	1.222337	0.593	1.43278	0.719	1.109358	0.726	0.294709	0.032*
Trust in farmers' group	1.799887	0.495	9.16958	0.675	0.704494	0.638	0.722377	0.768

*significant at 0.05% level

Table 10. Regression analysis of participation in the implementation of rice security programs and selected socio-economic variables

SOCIO-ECONOMIC VARIABLES	CONDUCT OF MONTHLY MEETING		SETTING UP THE ORGANIZATIONAL STRUCTURE		IMPLEMENTATION OF PROJECT ACTIVITIES	
	Odds Ratio	P> z	Odds Ratio	P> z	Odds Ratio	P> z
Age	1.051455	0.123	1.031316	0.286	0.871726	0.004**
Years of membership	1.12233	0.541	1.119077	0.490	0.921359	0.683
Household size	1.084644	0.579	0.935381	0.603	1.287513	0.205
Farming experience	0.985528	0.641	0.998242	0.950	1.069139	0.780
Total area of rice farm (ha)	0.465543	0.340	0.624517	0.476	5.270895	0.311
Parcel of land used for rice farming	1.714732	0.488	1.667111	0.433	0.396846	0.559
Household income per month (\$)	1.001855	0.547	1.00019	0.953	0.997409	0.497
Rice production income per month	1.000539	0.965	1.006244	0.560	0.989701	0.440
Financial resources	0.073992	0.000**	.4931318	0.168	1.344525	0.564
Attitude	7.232459	0.199	4.365362	0.244	2.747052	0.509
Trust in co- farmer	0.557822	0.150	0.979527	0.944	1.354009	0.477
Trust in farmers' group	0.849875	0.840	1.290426	0.887	1.311879	0.804

** significant at 0.01% level

With regard to rules and regulations crafting, no variable showed significant odds ratio. However, in terms of yearly planning, trust in co-farmers with an odds ratio of 0.294709 implies that trust enhances participation among the farmers and is important to sustain through time.

For the implementation phase, Table 10 shows that among the variables in the conduct of monthly meeting, financial resources of farmers' group with an odds ratio of 0.073991 had a significant p-value of 0.000. This suggests the probability of farmers participating fully in implementing the programs if the farmers' groups have resources to support the group activities.

In setting up the organizational structure, no variable was found significant in terms of the computed odds ratio and p-values. However, in terms of implementation of project activities, age with an odds ratio of 0.871726 (p-value = 0.004) indicates that older farmers tend to participate more due to their experience.

Finally, in the monitoring and evaluation activity, not one among the selected variables analysed was found significant. However, in terms of information for monitoring and evaluation activity, age recorded an odds ratio of 1.116144 (p-value = 0.009). This suggests that farmers participate more as they get older maybe due to their wisdom and experience (Table 11).

CONCLUSIONS

Majority of the farmers in Cailaco and Maliana who joined the farmers' groups were in their prime age with a mean of 44 years. They have been members of their farmers' group for four years and have been into farming for about 20 years. They were married, with low formal education and had relatively large household size. They had very favorable attitude toward joining farmers' groups and very high trust toward co-farmers and their farmers' group. Their farms generally measured 2 ha with two parcels used for farming. Their household income averaged US\$172.50 per month, while income from rice production ranged from US\$10 to US\$180 per month.

Table 11. Regression analysis of participation in the monitoring and evaluation of rice security programs and selected socio-economic variables

SOCIO-ECONOMIC VARIABLES	MONITORING AND EVALUATION		INFORMATION FOR MONITORING AND EVALUATION	
	Odds Ratio	P> z	Odds Ratio	P> z
Age	0.997278	0.943	1.116144	0.009**
Years of membership	0.771408	0.185	0.761369	0.162
Household size	0.937615	0.706	0.816089	0.218
Farming experience	0.994992	0.900	0.972272	0.508
Total area of rice farm (ha)	0.423517	0.311	0.259669	0.219
Parcel of land used for rice farming	2.197373	0.574	3.755490	0.222
Household income per month (US\$)	0.997976	0.574	0.992749	0.086
Rice production income per month	0.985272	0.205	0.979486	0.084
Financial resources	1.545885	0.543	1.356120	0.622
Attitude	10.39565	0.072	0.896352	0.934
Trust in co- farmer	1.182164	0.697	1.081149	0.853
Trust in farmers' group	1.54047	0.652	2.481384	0.237

** significant at 0.01% level

Among the four phases of the rice security programs, respondents' participation was highest in project identification. In other phases, participation was highest in yearly planning (planning phase), implementation of the project activity (implementation phase), and information for monitoring and evaluation (monitoring and evaluation phase). The results indicate that the farmers were fully involved from the beginning of the project until its monitoring and evaluation.

Several socio-economic factors affected the respondents' participation in the different phases of rice security programs. Year of membership in farmers' group and trust in co-farmers significantly affected problem identification phase; household size, income to support the family, and year of membership in farmers' group affected planning; age and financial resources were significantly related to implementation; and age significantly affected monitoring and evaluation.

RECOMMENDATIONS

Farmers' groups have significant contribution in the implementation of rice security program in Cailaco and Maliana sub-district, Timor-Leste. Based on the contribution extended by the farmers' groups, it is recommended that the project implementers strengthen the use of participatory project cycle management to enable members of farmers' groups to participate from the beginning until the implementation of food security programs. In this manner, they would appreciate the programs and develop a sense of belongingness in the farmers' groups.

Although farmers have attended a number of trainings to improve their farming practices, they still need to be empowered with knowledge on irrigation and off-season intensive farming of high-value crops to improve food security. This should be given attention because most of the farmers depend on rice and cassava as their main food staples.

Farmers' groups were initiated by the government and other non-government organizations in Cailaco and Maliana. For this reason, support should be properly provided so that farmers' groups until such time that they can stand by themselves once left on their own.

Farmers' groups should adopt and continuously practice improved rice technologies in order to be sufficient even during the "lean months." They should have a reserve supply of their staples and should not rely on the government's importation of rice during shortage.

Lastly, a further study should be done on the role of the various stakeholders in the sustainability of food security programs. This requires the involvement of the community in coordination with the Ministry of Agriculture and Fishery to ensure the adoption of improved agricultural practices. Policies that would safeguard and strengthen stakeholders' participation should be anchored on the needs of farmers' groups.

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