

## **Factors in Participation and Non-Participation in Farmer Field Schools in Trinidad and Tobago**

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### **Abstract**

*This study identifies and analyzes the factors affecting participation and non-participation in FFS in Trinidad and Tobago. The socio-demographic variables which describe FFS participants and non-participants were described. It was determined whether there is a significant relationship exists between the socio-demographic variables and participation status. In addition, it was determined whether there is a significant relationship exists between the factors that impact participation (life situation factors, institutional factors, and dispositional factors) and participation status.*

*There was a significant difference in gender and participation status. Considering that 73.3% of participants and 92.1% of non-participants were male, MALMR should consider taking measures to increase the participation of women in FFS. There was also a significant difference in the number of family members who had participated in prior FFS and participation status. As MALMR increases the number of FFS in Trinidad and Tobago and increasing numbers of individuals have family members who participate, this will stimulate non-participating farmers to join FFS.*

*The voluntary nature of participation in FFS necessitates that agricultural extension policymakers and practitioners give careful attention to the current patterns of participation in FFS in Trinidad and Tobago. They may employ strategies that impair or eliminate the factors leading to attrition and non-participation, thus making programs more accessible, prevent attrition, and increase participation and may decrease farmers' expenditures on pesticides, increase income, and benefit the environment.*

**Key words:** adult education, technology transfer, agro-ecology

### Introduction

In 2000, the Commonwealth Agricultural Bureau International (CABI) introduced the Farmer Field School (FFS) initiative to the Caribbean. In 2003, the Trinidad and Tobago Ministry of Agriculture Lands and Marine Resources (MALMR) and CABI introduced FFS in two locations, in the Caura Valley and South Aranguez (Dolly, 2005). As of December 2007, MALMR has carried out FFS in more than forty locations in Trinidad and Tobago. MALMR is using FFS as the vehicle for teaching farmers the principles and practices of integrated pest management (IPM) for vegetable production targeted for the local market.

The FFS approach to agricultural education and extension was developed by the Food and Agriculture Organization of the United Nations (FAO) in 1989. The approach was designed as hands-on way of diffusing knowledge-intensive integrated pest management principles and practices for East Asian rice-based systems (van de Fliert, 1993). According to Tripp, Wijeratne, & Piyadasa (2005), the “defining characteristics of FFS include discovery learning, farmer experimentation, and group action.” (p. 1707) The purpose of FFS was to enable farmers to engage in decision-making processes on the ecology of their own fields by improving their analytical and decision-making skills. Agro-ecosystems analysis (AESA) is the discovery learning methodology taught in FFS. The intent of the AESA approach is to discontinue dependency on pesticides as the primary pest-control measure. To achieve this, farmers needed to understand the ecological principles and processes governing pest population dynamics.

FFS groups are generally composed of 15-25 farmers who meet once a week in a designated field throughout the crop cycle. Farmer experimentation plays a critical role in FFS. Using AESA to understand pest population dynamics, farmers observe the processes and relationships between the harmful insects and their natural enemies in two plots, one using conventional practices and the other IPM practices. They then draw their observations on flip-chart paper and discuss them. The FFS facilitator, usually an extension agent or NGO staff member, takes particular care to not provide answers through lectures, but to stimulate the farmers to ask questions and find their own answers. In addition, FFS facilitators build group dynamics through activities designed to foster group action (Tripp, Wijeratne, & Piyadasa, 2005). Thus, FFS provide opportunities for farmers to learn-by-doing, based on the principles of non-formal education. Extension agents and farmer-trainers facilitate the learning process, stimulating farmers to discern key agro-ecological concepts and develop skills through experiential learning in the field (Braun, Thiele, & Fernandez, 2000).

Extension practitioners and academics have noted the effectiveness of FFS for the transmission of agricultural knowledge. In a study of rice-farmers in the Philippines, Rola, Jamias, and Quizon (2002) found that FFS graduates possess greater knowledge of integrated pest management than their non-FFS peers and that graduates retain their field school knowledge. In recent years, extension agencies have expanded FFS to include in its curriculum other topics relevant to resource-poor farmers. In a study on the effectiveness of FFS for soil and crop management technologies in Kenya, Bunyatta, Mureithi, Onyango, and Ngesa (2006) found that FFS graduates acquired high to very high levels of knowledge of the technologies presented in comparison to non-FFS farmers. David (2007) noted that FFS graduates in Cameroon acquired “superior knowledge on cocoa integrated crop and pest management generally compared to non-FFS farmers.” (p. 35) The results of a study on FFS pilot projects in three South American countries showed that FFS-trained farmers, compared to other farmers, acquired

increased knowledge on diseases affecting potatoes (Thiele, Nelson, Ortiz, & Sherwood, 2001). FFS, a non-formal adult education program, holds great potential as a vehicle for the dissemination of agricultural knowledge and practice.

Every year, millions of adults enroll in adult education programs. These programs may range from vocational training, including agricultural extension programs, to basic education classes, to sports and recreational classes. Adults' motivations for participating in adult education are as diverse as the lives they lead (Silva, Cahalan, Lacireno-Paquet, 1998). Moreover, there are many adults, who despite the educational opportunities provided in their communities chose to not participate. It is widely believed by adult education theorists and practitioners that program non-participants would benefit from educational programming. As a result, a great deal of research has been conducted in recent decades to identify factors that advance or constrain participation in adult education programs (Burgess, 1971; Dirx & Jha, 1994; Garrison, 1985).

### **Purpose and Objectives**

David Dolly, from the University of the West Indies in Trinidad and Tobago, and Pauline Dowlath of MALMR, identified the issue of non-participation as salient to the challenges faced by agricultural extension in Trinidad and Tobago (personal communication, January 2006). The limited understanding of the factors of participation in FFS hinders the progress of FFS as a means for agricultural education and extension in Trinidad and Tobago. In addition, Davis (2006) declared of FFS on a global scale, "The issue of participation in farmer field schools has barely been touched in the literature." (p. 94) The absence of literature on the issues surrounding participation in FFS in Trinidad and Tobago and elsewhere hinders our knowledge-base required for effective scaling-up of this approach.

Considering that FFS is a financially expensive vehicle for conducting agricultural extension and educational outreach (Rola, Jamias, & Quizon, 2002), non-participants' reticence constitutes a challenge for the dissemination of the FFS methodology. Understanding why non-participants do not participate (Beder, 1990, Darkenwald & Valentine, 1985) is a major concern of researchers, policymakers, and practitioners of adult education, including agricultural extension (Norland, 1992).

The purpose of the study is to identify and analyze factors affecting participation and non-participation in FFS in Trinidad and Tobago. The objectives identified to accomplish the purpose were:

1. To describe the socio-demographic variables which describe FFS participants and non-participants,
2. To determine if a significant relationship exists between the socio-demographic variables and participation or non-participation status
3. To determine if a significant relationship exists between the factors that impact participation (life situation factors, institutional factors, and dispositional factors) and participation status.

### **Theoretical Framework**

The theoretical framework rests on the literature in the field of adult education focused on participation theories. According to Knowles (1980), lifelong learning is the organizing principle of education. Considering the value of adult education, it is no wonder that "one of the most widespread, enduring, and passionate commitments of continuing education practitioners is

to reduce barriers and to encourage participation and persistence in our educational programs for adults.” (Knox, 1987, p. 7)

It is vitally important to understand the differences between adult education and other types of education. Adults fulfill a variety of roles, such as worker, spouse, and parent, each with its respective set of responsibilities. These competing responsibilities reduce the amount of time and energy adults may spend on educational endeavors. Adults, therefore, typically seek educational opportunities that enable them to “solve problems”; that is, they are willing to invest their time and energy in educational pursuits which better prepare them to address their perceived areas of need. Considering the voluntary nature of adult education, adults typically choose to attend educational activities only if they satisfy immediate needs. It is plain to see the very practical importance for adult educators to know what motivates people to attend educational activities as well as the barriers to participation. (Kowalik, 1989)

Houle’s (1961) seminal research on participation motivation classified adult learners based on their reasons or motives for participation in educational activities. According to Houle’s typology, individuals may be classified as goal-oriented, activity-oriented, or learning-oriented. Goal-oriented individuals participate in educational activities to accomplish clear-cut objectives. Activity-oriented individuals participate in educational activities primarily for social contact with other adults rather than for any specific educational pursuit. Finally, learning-oriented individuals seek knowledge for its own sake.

Despite the heuristic value of Houle’s typology, it did not address the barriers to education facing adults. Cross’s (1981) Chain of Response (COR) Model integrated concepts from Houle’s typology and other adult education researchers into a paradigm describing the motivation to participate. Included in the model is Cross’s conceptualization of the barriers to participation. Cross developed a typology consisting of three categories of barriers to participation in adult education: situational barriers, institutional barriers, and dispositional barriers. Situational barriers stem from “one’s situation in life at a given time, such as the lack of time due to job and home responsibilities.” (Cross, 1992, p.98) Institutional barriers are those factors related to the institution which discourage participation, such as inconvenient schedules and meeting places. Dispositional barriers are those related to attitudes and self-perceptions of the individual (Kowalik, 1989).

### **Methods and Data Sources**

This study employed an ex post facto research design. According to Gall, Gall, and Borg (2007), an ex post facto research design relies on “observation of relationships between naturally occurring variations in the presumed independent and dependent variables” (p. 306).

The population in this study consisted of FFS participants and non-participants in Trinidad and Tobago. The sample consisted of the FFS participants (n=56) in five FFS: Transfer Village (n=11), La Trinidad (n=13), Grand Fond (n=9), Cemetery Trace (n=8), and Platanite (n=15). Non-participants (n=38) were farmers in the physical proximity of a FFS: Transfer Village (n=10), La Trinidad (n=9), Grand Fond (n=7), Cemetery Trace n=6), and Platanite (n=6). Non-participating farmers attended the initial session of a FFS but chose to not participate during the educational cycle.

Instruments were developed to gather socioeconomic data of FFS participants and non-participants, including gender, marital status, whether they had participated in any prior agricultural extension activities, education, number of family members who have participated in prior FFS, number of friends who have participated in prior FFS, age, size of their farm, number

of years lived in the community, number of years farmed, and the percentage of income derived from agriculture. In addition, the research instrument included a quantitative, close-ended category-scale questionnaire that gathered participants' and non-participants' perceptions regarding the life situation factors, institutional factors, and dispositional factors that influenced their participation (or non-participation) in FFS. The quantitative, close-ended category-scale questionnaire consisted of a four-point Likert-type scale (1=Strongly Disagree; 2=Disagree; 3=Agree; 4=Strongly Agree).

The instruments were checked for face validity by a panel of 15 MALMR extension agents familiar with the issues of participation and non-participation in FFS in Trinidad and Tobago. The panel gave suggestions to improve the clarity and cultural sensitivity of the questions. Five members of the panel were selected to carry out the survey in the five FFS. Training was conducted to ensure that the interviewers would follow a standard protocol, thus ensuring the content validity of the instruments.

Data were gathered in May-October 2007. Quantitative data analysis was conducted via SPSS© (Version 15) to determine basic statistics such as frequencies, percentages, means, standard deviations, chi-square test for independence, and t-tests.

## Results

### *Socio-Demographic Variables*

As shown in Table 1, participants (73.2%) and non-participants (92.1%) are overwhelmingly males. The vast majority of participants (80.3%) and non-participants (81.5%) are married. Roughly two-thirds of participants (67.9%) and non-participants (71.1%) had not participated in any agricultural extension program prior to FFS. The most common levels of education attained by participants are Standard 4-5 (32.1%), Standard 6 (28.6%), and Form 4-5 (21.4%). In similar fashion, non-participants attained Standard 4-5 (26.3%), Form 4-5 (23.7%), and Standard 6 (21.1%). The majority of participants (57.1%) and non-participants (71.1%) had zero family members who had participated in prior FFS. Participants (39.3%) indicated that they had five or more friends who have participated in FFS while non-participants (23.7%) reported about half the rate. Nearly half of participants (41.1%) are younger than 44 while nearly half of non-participants (42.1%) are older than 53 years old. Participant's (44.6%) and non-participants (65.8%) report that their farms are 3-5 acres. Participants (44.6%) have lived in the community for 27-48 years whereas non-participants (44.7%) have lived in the community for forty-nine or more years. Participants (41.1%) and non-participants (28.9%) stated that they had farmed for twenty years or less. Other participants (28.6%) and non-participants (39.5%) stated that they had farmed for 36 years or more. Finally, roughly half of participants (57.1%) and non-participants (47.4%) indicated that all of their income was derived from agricultural enterprise.

Table 1

*Socio-Demographic Variables of Respondents by Completion Status in the Farmer Field School Program, Five Farmer Field Schools, Trinidad and Tobago, 2007*

	<i>Participants</i>		<i>Non-Participants</i>	
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
Socio-Demographic Variables				

<i>Gender</i>				
Female	15	26.8	3	7.9
Male	41	73.2	35	92.1
<i>Current Marital Status</i>				
Single	10	17.9	4	10.5
Married	45	80.3	31	81.5
Separated/Divorced	1	1.8	3	7.9
Widowed	0	0	0	0
<i>Participated in any agricultural extension programs before FFS</i>				
Yes	18	32.1	11	28.9
No	38	67.9	27	71.1
<i>Education</i>				
Standard 1-3	5	8.9	3	7.9
Standard 4-5	18	32.1	10	26.3
Standard 6	16	28.6	8	21.1
Form 1-3	4	7.1	5	13.2
Form 4-5	12	21.4	9	23.7
Form 6	1	1.8	2	5.3
Other	0	0	1	2.6
<i>Number of family who have participated in FFS</i>				
0	32	57.1	27	71.1
1	10	17.9	6	15.8
2+	14	25	5	13.2
<i>Number of friends who have participated in FFS</i>				
0-1	16	28.6	17	44.7
2-4	18	32.1	12	31.6
5+	22	39.3	9	23.7
<i>Age</i>				
0-44	23	41.1	10	26.3
45-52	18	32.1	12	31.6
53+	15	26.8	16	42.1
<i>Size of farm</i>				
0-2	23	41.1	10	26.3
3-5	25	44.6	25	65.8
6+	8	14.3	3	7.9

<i>Years lived in the community</i>				
0-26	18	32.1	10	26.3
27-48	25	44.6	11	28.9
49+	13	23.2	17	44.7
<i>Years farmed</i>				
0-20	23	41.1	11	28.9
21-35	17	30.4	12	31.6
36+	16	28.6	15	39.5
<i>Percentage of annual income derived from agriculture</i>				
0-50	16	28.6	16	42.1
51-99	8	14.3	4	10.5
100	32	57.1	18	47.4

*Relationship Between the Socio-Demographic Variables and Participation or Non-participation Status*

A chi-square test for independence was conducted to compare the nominal-scaled socio-demographic variables gender, marital status, participation in agricultural extension programs prior to FFS, and educational background with participation status. As shown in Table 2, a chi-square test for independence indicated no significant association between marital status, participation in agricultural extension programs prior to FFS, or education with participation status. A chi-square test for independence did indicate, however, a significant association between gender and participation status,  $X^2(1, n=94) = 4.07, p = .044, \phi = .236$ . The effect size approaches a medium effect.

Table 2

*Chi-Square Tests: FFS Participants and Non-Participants by Socio-Demographic Variables, Five Farmer Field Schools, Trinidad and Tobago, 2007*

Socio-demographic variables	$X^2$	<i>P</i>	<i>phi</i>
<i>Gender</i>	4.07	.044*	.236
<i>Marital Status</i>	2.87	.411	.175
<i>Participated in any agricultural extension programs before FFS</i>	.010	.919	.034
<i>Education</i>	4.03	.673	.207

Note. \* $p > .05$

Cohen's phi (1988): 0.10 (small effect), 0.30 (moderate effect), 0.50 (large effect)

T-tests were conducted to compare the continuous, dependent variables- number of family who have participated in FFS, number of friends who have participated in FFS, age, size of farm, years lived in the community, years farmed, and the percentage of annual income derived from agriculture- with participation status. As shown in Table 3, the only comparison to

yield a significant difference between participants ( $M= 1.13$ ,  $SD= 1.96$ ) and non-participants ( $M=.50$ ,  $SD= .95$ ;  $t(94) = 2.06$ ,  $p= .042$  was the number of participating family members in FFS. The effect size ( $d= .04$ ) approached a moderate effect. There was no significant difference in the other socio-demographic variables and participation status.

Table 3

*T-tests: FFS Participants and Non-Participants by Socio-Demographic Variables, Five Farmer Field Schools, Trinidad and Tobago, 2007*

Socio-demographic variables	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
<i>Number of family who have participated in FFS</i>						
Participants	56	1.13	1.96	2.06	.042*	.04
Non-Participants	38	.50	.95			
<i>Number of friends who have participated in FFS</i>						
Participants	56	5.20	5.20	1.63	.107	.628
Non-Participants	38	3.50	4.57			
<i>Age</i>						
Participants	56	45.3	11.6	-1.88	.063	.037
Non-Participants	38	49.6	10.2			
<i>Size of Farm</i>						
Participants	56	4.64	5.84	1.07	.287	.012
Non-Participants	38	3.59	1.91			
<i>Years lived in community</i>						
Participants	56	35.9	17.2	-1.63	.106	.028
Non-Participants	38	41.7	16.6			
<i>Years Farmed</i>						
Participants	56	26.8	15.2	-1.84	.068	.035
Non-Participants	38	32.5	13.4			
<i>Percentage of annual income derived from agriculture</i>						
Participants	56	77.4	30.3	1.22	.224	.015
Non-Participants	38	69.3	32.8			

Note. 1=Strongly Disagree; 2=Disagree; 3=Agree; 4=Strongly Agree

\* $p<0.05$

Cohen's  $d$  (1988): 0.01 (small effect), 0.06 (moderate effect), 0.14 (large effect)

*Relationship between Life Situation Factors, Institutional Factors, and Dispositional Factors and Participation Status*

T-tests were conducted to compare the life situation factors, institutional factors, and dispositional factors with participation status. As shown in Table 4, there was a significant difference in participants ( $M=2.39$ ,  $SD= .289$ ) and non-participants ( $M=1.86$ ,  $SD= .258$ ;  $t(94)$

= 9.08,  $p= 0.00$ ,  $d=.472$ ) on the life situation factors. This approaches a moderate effect size. There was a significant difference in participants ( $M= 3.41$ ,  $SD= .438$ ) and non-participants ( $M= 2.74$ ,  $SD=.539$ ;  $t(94) = 6.63$ ,  $p= 0.00$ ,  $d= .323$ ) on the construct Institutional Factors: Convenience. This is a small effect size. There was also a significant difference in participants ( $M=3.31$ ,  $SD= .468$ ) and non-participants ( $M=2.88$ ,  $SD= .605$ ;  $t(94) = 3.87$ ,  $p= 0.00$ ,  $d= .140$ ). This is a small effect size. Two constructs, Institutional factors: Process and Application and Dispositional Factors, were not statistically significantly different in regards to participation status.

Table 4

*T-tests: Relationship between Life Situation Factors, Institutional Factors, and Personal Preference Factors and Participation Status, Five Farmer Field Schools, Trinidad and Tobago, 2007*

Participation factors	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
<i>Life Situation Factors</i>						
Participants	56	2.39	.289	9.08	0.00*	.472
Non-Participants	38	1.86	.258			
<i>Institutional factors: Convenience</i>						
Participants	56	3.41	.438	6.63	0.00*	.323
Non-Participants	38	2.74	.539			
<i>Institutional factors: Process and Application</i>						
Participants	56	2.91	.443	1.10	.270	.012
Non-Participants	38	2.81	.347			
<i>Institutional factors: Outcomes</i>						
Participants	56	3.31	.468	3.87	0.00*	.140
Non-Participants	38	2.88	.605			
<i>Dispositional factors</i>						
Participants	56	2.60	.365	1.08	.280	.012
Non-Participants	38	2.52	.311			

Note. 1=Strongly Disagree; 2=Disagree; 3=Agree; 4=Strongly Agree

\* $p<0.05$

Cohen's  $d$  (1988): 0.01 (small effect), 0.06 (moderate effect), 0.14 (large effect)

### Conclusions, Implications, and Educational Importance

This study identified and analyzed the factors affecting participation and non-participation in FFS in Trinidad and Tobago. The socio-demographic variables which describe FFS participants and non-participants were described. It was determined whether there a significant relationship existed between the socio-demographic variables and participation status. In addition, it was determined whether a significant relationship existed between the factors that impacted participation (life situation factors, institutional factors, and dispositional factors) and participation status.

There was a significant difference in gender and participation status. Considering that 73.3% of participants and 92.1% of non-participants were male, MALMR should consider taking measures to increase the participation of women in FFS. There was also a significant difference in the number of family members who had participated in prior FFS and participation status. As MALMR increases the number of FFS in Trinidad and Tobago and increasing numbers of individuals have family members who participate, this will stimulate non-participating farmers to join FFS.

The voluntary nature of participation in FFS necessitates that agricultural extension policymakers and practitioners give careful attention to the current patterns of participation in FFS in Trinidad and Tobago. They may employ strategies that impair or eliminate the factors leading to attrition and non-participation, thus making programs more accessible, prevent attrition, and increase participation and may decrease farmers' expenditures on pesticides, increase income, and benefit the environment.

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