doi: *10:5191/jiaee.2013.20203*

Effectiveness of Farmer Information Needs Assessment as Perceived by the Farmers

Md J Meagy
Stockbridge School of Agriculture
Department of Plant and Soil Sciences
University of Massachusetts Amherst
201 Natural Resources Road
Bowditch Hall 102
Amherst MA 01003-9294, USA
Tel: (413)-577-3102
Fax: (413)-545-0260
jmeagy@psis.umass.edu

Md Harunor Rashid
Department of Agricultural Extension Education
Bangladesh Agricultural University, Mymensingh 2202
Bangladesh, Tel: +88091-52087
Tel: +8801732-016646,
rashid.ext.bau@gmail.com

Allen V Barker
Stockbridge School of Agriculture
University of Massachusetts,
Amherst MA 01003-9294 USA,
Tel: (413) 5454733
barker@umass.edu

Md Monirul Islam
Department of Agricultural Extension Education
Bangladesh Agricultural University, Mymensingh 2202
Bangladesh
mdmonirul@yahoo.com

Md Nazrul Islam
Graduate Training Institute
Bangladesh Agricultural University, Mymensingh 2202
Bangladesh
Tel: +8801711-362652,
Fax: +880-91-61510
islam.gti.bau@gmail.com

Abstract

In Bangladesh, adoption of new extension program and implication is still limited. The objectives of the study were to determine and describe farmers' perceptions on the effectiveness of Farmer Information Needs Assessment (FINA) and to explore the relationships between farmers' characteristics and their perceptions of FINA. The study was conducted in Hajigonj, Chandpur, Bangladesh. One hundred twenty FINA-participating farmers were interviewed with a multistage, random-sampling method. An overall moderate to highly favorable perception of the FINA program was found. About half of the farmers responded with moderately favorable perceptions of FINA in providing extension services. However, less than half of the farmers responded moderately favorably in adopting recommended practices, even though more than one-third of the farmers responded with highly favorable perceptions of FINA. Seven of twelve farmer characteristics showed a significant relationship with farmer perceptions of the effectiveness of FINA: that is, middle-aged farmers were more active participants in FINA and in farming than young people; more than 60% of participants operated small farms, and they were more motivated by the FINA program than large-farm operators; farmers with moderate to high incomes participated more in FINA than did low-income farmers; and increased contact with extension personnel and increased agricultural knowledge improved farmers' perceptions of FINA. The results allowed a conclusion that FINA, the leading problem assessment approach in agricultural extension, was effective for sustainable agricultural production. Extension departments and farmers can benefit from studying these results to identify and to solve their farming questions.

Keywords: Agricultural Extension Approach, Farmers' Perceptions, FINA, Hajigonj, Bangladesh.

Introduction

Agricultural enterprises involve two thirds of the rural population of Bangladesh (FFYP, 1998), which has an area of 56,000 sq miles and a population near 115 million (BBS, 2000; Mahtab & Karim, 1992). The economy of Bangladesh is dependent predominately on agriculture. About 85% of the total population lives in rural areas, and the major occupation of these residents is farming. Bangladesh has a limited cropped area of 14.27 million ha, and its cropping intensity is 176% (BBS, 2000), meaning that more than one crop is grown per year on the same land. In the 1999–2000 financial years, the agricultural sector contributed 25.5% of the Gross Domestic Product (GDP) (Anonymous, 2000; BBS, 2000). Despite these achievements, agriculture in Bangladesh has faced tremendous problems in sustainable crop production. A vast number of farmers seek substantial help for their farming problems. For sustainable food production, great care should be taken to address the needs of the farmers and to provide them with necessary inputs and information. Well-managed extension services are, therefore, needed for efficient transfer of technology (Enos, 1989; Pretty & Chambers, 1993).

Agricultural extension in Bangladesh has followed an evolutionary process of implementation with components of several organizational approaches (Rogers, 1995; Stone, 1997). A major role of agricultural extension in developing countries has been disseminating technologies generated by public sector research organizations through appropriate strategies such as demonstrations, field visits, farmers'

meetings, and use of media. Among these, the Training and Visit (T&V) approach was established during the late 1970s by putting extension services under supervision of the Department of Agricultural Extension (DAE) (Feder & Slade, 1986; Suryanarayana et al., 1990). The T&V approach improves communications between research and extension, and more than 40 countries have adopted this approach (Birkhaeuser et al., 1991). However, a study noted that agricultural T&V extension personnel (e.g., block supervisors) were found to lack technical and performance appraisal training that focused challenges in agricultural extension in Bangladesh (Reynar & Bruening, 1996). However, a practical study in Ethiopia revealed that the T&V approach was effective in disseminating innovations and increasing yields among contacted farmers, upgrading extension agents' skills, and imparting valuable lessons for other extension systems (Dejene, 1989).

Farmer information needs assessment (FINA) is an approach by the Department of Agricultural Extension (DAE), Bangladesh, in which farmers can identify their needs and extension workers assess these needs and recommend support. FINA is a principle of the revised extension approach of DAE. In this approach, the FINA program determines the key problems and opportunities that farmers face and types of information that they require to get a responsive extension services (DAE, 1999). The main elements of FINA are the Block Supervisors (BSs) diary, the Problem Census, Participatory Rural Appraisal (PRA) and consultation with other organizations responsible for conducting this program. Problem Census and BSs diary mainly are adopted by DAE where FINA programs are conducted by their field staffs, who meet with group of farmers to review agricultural situation, identify main problems, and discuss opportunities for possible solutions. The Problem Census is a participatory technique of DAE that assists farmers in analyzing, planning, and developing agriculture. In the field, it is focused in a group discussion where farmers identify their problems and suggest solutions through BSs. In the most cases, FINA is following the Problem Census process in which four major steps occur (a) organizing a meeting, (b) explaining a topic, (c) forming sub-groups and listing problems, and (d) discussing problems and concluding with solutions for assessment of farmers needs.

DAE suggested that FINA is an effective tool for identifying farmers' needs and solutions (DAE, 1999). Recently, it is argued generally that FINA programs are not sincere in identifying farmers' needs and providing effective extension services, resulting in a poor flow of information to the farmers. In accordance with the extension services, a study revealed that methods like personal contact, demonstration, group discussion, and literature were the most effective extension services for technology transfer, whereas radio programs, film shows, and meetings were moderately effective (Tripathy & Panday, 1967). An early study regarding the role of extension workers found that the field extension agent was the most effective person or means in agricultural motivation, as compared to neighbors and friends, village level worker, radio, Agricultural Extension Officer (AEO), literature, and film show. The finding also revealed that Block Development Officers (BDO) were not contacted by the farmers at all in any stages for farming questions (Rajaguru & Satapathy, 1971). In spite of huge challenges in communicating new agricultural developments to potential farmers, extension program plays an important role in providing food and fuel for the world's most

densely populated large country (Bartholomew, 1994). A similar study linked with the agricultural extension program revealed that the Mennonite Central Committee's (MCC) extension work had contributed to increasing the net income level of farmers and provided technical assistance to extension activities for accessing good quality seeds (Reynar et al., 1996).

A study was conducted regarding to the role of organizational group when a group reaches its goal based on its goal model. The results suggested that there was a significant positive relationship between group effectiveness and its members' performances (Deep, 1978). Another study revealed that 65% of contacted farmers were classified as *most effective* in influencing other fellow farmers, whereas 23% of the farmers were *moderately effective* and 12% were *less effective*. The findings stated that farmers who used extension teaching methods were effective in transferring extension knowledge on improved technology to other farmers in the area of their operation (Suryanarayana et al., 1990).

An extension study of communication media found no significant relationship between age of the farmers and their opinion of the effectiveness of the Mati-O-Manush program on Bangladesh Television in disseminating agricultural information (Islam, 1998). On the other hand, a study found that the age group of contact farmers has a significant negative relationship with the effectiveness of farmers in influencing the adoption behavior of the other fellow farmers (Suryanarayana et al., 1990).

A study revealed a positive significant relationship between the level of education of farmers and their opinion regarding effectiveness of information disseminated to the farmers through Agricultural Radio Programs (ARPs). The findings also indicated that an increased level of education of the farmers increases the opinion of the farmers regarding effectiveness of information passed through ARPs (Sarker, 1996). Research conducted on adoption of potato technologies found that the fertilizer costs, high seed costs, lack of quality seeds, lack of awareness, lack of knowledge about technologies and low price of potato at harvest period were perceived as great barriers for the adoption of technologies (Muttaleb et al., 1998).

Purpose and Objectives

The purpose of this study was to determine the effectiveness of the Farmer's Information Need Assessment (FINA) extension program as perceived by the participants. The specific objectives of the study were to:

1. Determine and describe the farmers' perception on the effectiveness of FINA in terms of (i) providing extension services and (ii) adopting recommended agricultural practices.
2. Find out the problems faced by the farmer in implementing FINA program.
3. Explore and describe the role of the selected characteristics (age, educational qualification, family size, farm size, annual income, organizational participation, cosmopoliteness, extension media contact, farming experience, farming facilities, innovativeness, and agricultural knowledge) of the farmers and reveal the relationships between farmers' characteristics and their perception on the effectiveness of FINA.

Methods

The study was conducted in six randomly selected unions from a total of twelve unions of the Hajigonj Upazila of

Chandpur District in Bangladesh (Table 1; Figure 1). The farmers who participated in the FINA extension program conducted by the BSs of DAE constituted the population of the study. The selected Unions were Hajigonj Paurashava, Barkul Paschim, Hajigonj, Hatila Purba, Rajargaon Dakshin, and Kalocho Uttar. First, eleven blocks from total nineteen were selected randomly for collection of population so that at least 50% of the blocks of each union were considered. Then, half of the FINA participating farmers of each of eleven blocks were selected using a table of random numbers (Kerlinger, 1973). Thus, a total of 120 sample populations were selected from 432 FINA participating farmers in nineteen blocks. In this study, variables were constructed as independent or dependent variables. The twelve selected characteristics (Table 2) of the FINA farmers were considered the independent variable, and *farmers' perception on the effectiveness of FINA* was considered the dependent variable of the study. Data were collected using interview schedules in a local language with respect to the objectives of the study. All qualitative data were converted into quantitative data using a suitable score wherever necessary, as in the following text and in Table 2.

Table 1. Distribution and Selection of Population in Unions and Blocks Constituting FINA Program in Hajigonj Upazila, Bangladesh

Name of Union	Name of Block	Total Population	Sample population	Reserve list[†]
Hajigonj Paurashava	Toragar	25	0	0
	Kongaish	23	11	1
	Katrabilwai	20	10	1
	Balakhal	24	0	0
Barkul Pschim	Ram Chandrapur	23	11	1
	Jakni	25	0	0
	Natehara	20	10	1
Hajigonj	Uechanga	22	11	1
	Olipur	20	10	1
	Suhilpur	23	0	0
	Kajirgaon	20	0	0
	Sudia	24	12	1
Hatila Purba	Hatila	23	0	0
	Tongirpar	20	10	1
	Belgar	24	12	1
Rajagaon Dakshin	Bakila	25	12	1
	Sorna	24	0	0
Kalocho Uttar	Kapikap	22	11	1
	Tarapalla	25	0	0
Total		432	120	11

[†] Reserve lists used in case of absence during data collection

Appropriate tests were developed to measure the independent variables (Table 2). *Age* of a respondent farmer referred to the period of time from birth to the time of the interview. The age of a farmer was measured in terms of years and was obtained during the interview. *Educational qualification* was measured in terms of grades (classes) passed by a respondent. If a respondent passed the final examination of class five, his education score was taken as 5. However, illiterate persons who could not read or write were given a score of 0; a person who did not know how to read or write but was able to sign only was given a score of 0.5.

Family size was measured by the total number of family member of the respondent, including the farmer, spouse, children, and other dependents full or partial. *Farm size* (FS) was measured in terms of actual operating land of a respondent. Farm size was computed in hectares using the following formula; $FS = A_1+A_2+A_3+ ½ (A_4+A_5)$, where, A_1 is the homestead area; A_2 is the cultivated area owned by a farmer; A_3 is the cultivated area taken by a farmer from others on a lease system; A_4 is the area given to others on the borga system (i.e., landlord and producer each get half of produce); A_5 is the area taken by a farmer from others on the borga system. *Annual income* has been used to refer to the total earnings of the respondent and the members of the family from agricultural and non-agricultural sources during a year and expressed in taka (local currency of Bangladesh). *Organizational participation* (OP) was computed of a respondent in the following formula, $OP = P_{om} \times N_i + P_{em} \times N_i + P_{eo} \times N_i$, where, P_{om} is the ordinary member, P_{em} is the executive committee member; P_{eo} is the executive officers (president, secretary etc.); and N_i is the number of organizations (i=1, 2, 3…). *Cosmopoliteness* was computed of a respondent in terms of the degree of cosmopoliteness (5-point scale) on the basis of the farmer's visits to the eleven different types of selected external places from the farmer's social system. *Extension media contact* was measured of a respondent in respects to the extent of contact with each of the twenty-one selected sources of extension media during last one year prior to data collection. The respondent's answer was classified as any of six responses scored from 0 to 5, where 0 indicated contact with extension media to be "not at all", and 5 indicated a "daily" basis. *Farming experience* was computed of a respondent on the basis of experience from active farming and was expressed in years.

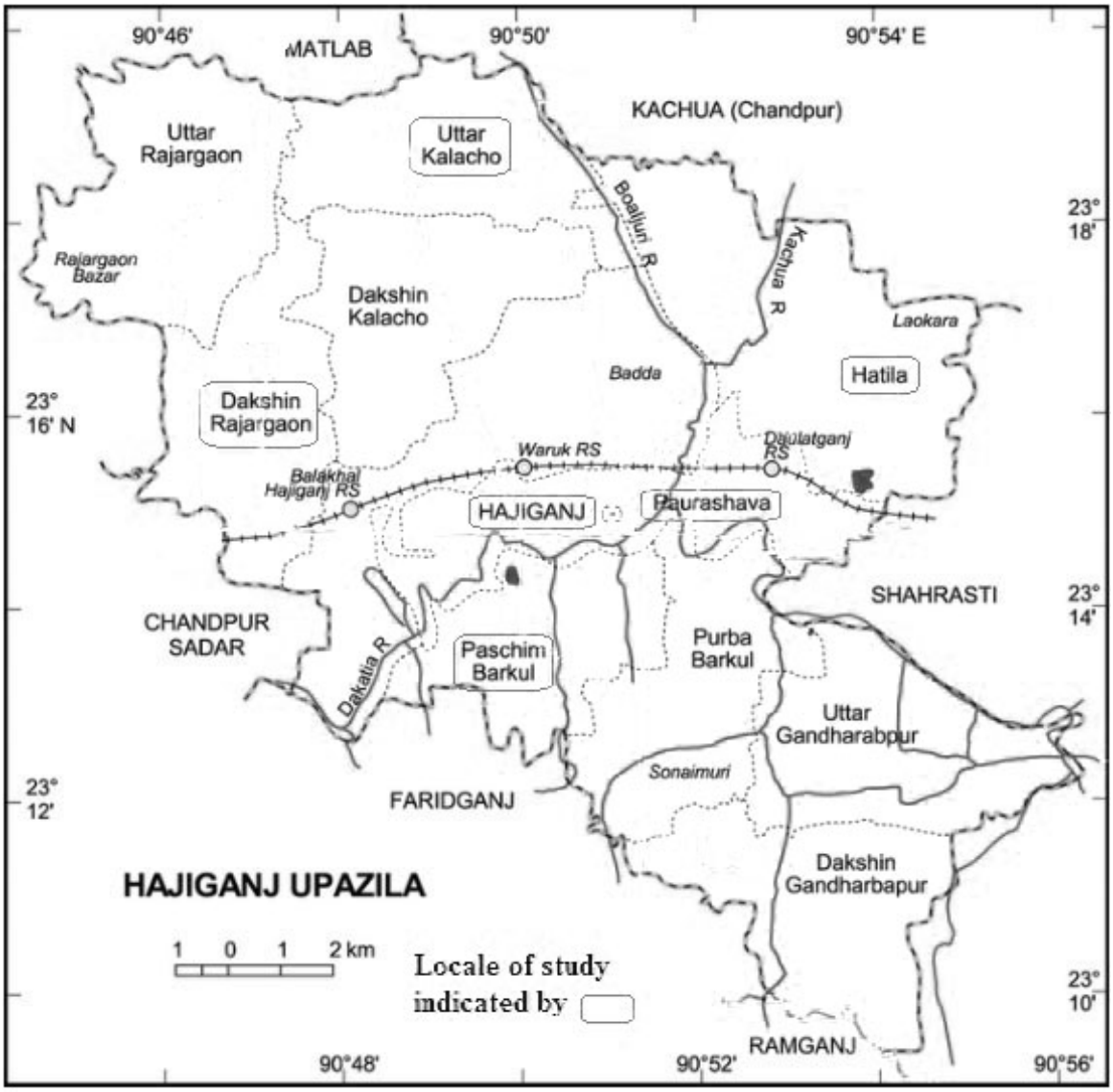

Figure 1. Distribution of locale in Hajigonj Upazila under Chandpur District of Bangladesh

Table 2. Prominent Features of the Selected Characteristics and Distribution of the Farmers in Accordance with their Scores (n=120).

Characteristic	Scoring unit	Possible score	Observed score	Categories	Farmers (%)	Mean	SD*
Age	Years	None	25 to 85	Young aged	12.5		
				Middle aged	52.5	51.6	12.97
				Old	35		
Educational qualification	Years of schooling	None	0 to 14	Illiterate	2.5		
				Primary	31.6		
				Secondary	47.5	7.2	3.88
				Higher secondary	14.2		
				Degree and up	4.2		
Family size	No. of members	None	3 to 22	Small	5.8		
				Medium	60.8	8	3.54
				Large	33.4		
Farm size	Hectare	None	0.2 to 5.5	Small size	61.7		
				Medium size	18.3	1.1	0.73
				Large size	20		
Annual income	000' Taka	None	18 to 543	Low	15		
				Medium	49.2	100.9	78.25
				High	35.4		
Organizational participation	Scores	0 to 51	0 to 25	Zero or no	5		
				Low	74.2	3.9	4.10
				Medium	20.8		
Cosmopolite-ness	Scores	0 to 40	7 to 34	Low	19.2		
				Medium	56.7	18	6.50
				High	24.1		
Extension media contact	Scores	0 to 105	22 to 75	Low	31.7		
				Medium	47.5	45.5	12.36
				High	20.8		
Farming experience	Years	None	2 to 65	Low	20		
				Medium	41.7	29.1	14.25
				High	38.3		
Farming facilities	Scores	0 to 63	10 to 59	Low	25.8		
				Moderate	64.2	37.4	9.67
				Sufficient	10		
Innovativeness	Scores	0 to 60	8 to 38	Low	17.5		
				Medium	47.5	27.1	6.47
				High	35		
Agricultural knowledge	Scores	0 to 50	24 to 48	Low	17.5		
				Medium	54.2	36.8	5.52
				High	28.3		

*SD, Standard deviation

Farming facilities was measured from twenty-one selected farming facilities on the basis of the following weighted scale, where 0 means no facilities, 1 means few facilities, 2 means moderate facilities, and 3 means sufficient facilities. *Innovativeness* was measured on the basis of the period of adoption of fifteen improved agricultural practices. Adoption of each practice was scored as 0 to 4, where 0 means no adoption, 1 means one year of adoption, 2 means two years of adoption, 3 means three years of adoption, and 4 means four or more years of adoption. *Agricultural knowledge* was computed of a respondent on the basis of response to twenty-five selected questions in the interview schedule. Score was assigned for correct answers from 1 to 3 according to the basis of the questions, and a 0 score was assigned for wrong answer.

Farmers' perception of the effectiveness of FINA was measured on the basis of the perception of the farmers in terms of (a) providing extension services and (b) adopting recommended agricultural practices. A four-point scale was used to measure the perception of the farmers. The scale contained fifteen statement questions on the effectiveness of FINA in terms of "providing extension services" and "adopting recommended agricultural practices" respectively. The response of each statement was weighted from 1 to 4. Where 1 means "disagree," 2 means "no opinion," 3 means "agree," and 4 means "strongly agree" with the statement. The perception score of a respondent was determined by adding up the weights for responses against all the thirty statement questions. The score ranged from 30 to 120, where a score of 30 indicated the most unfavorable perception and 120 indicated the most favorable perception on the effectiveness of FINA. The perception indices (PI) were measured by multiplying the frequency counts of each of the statements cell of perception scored as above assigned weights. The PI of each statement along with rank order was computed using the following formula: $PI = P_{da} \times 1 + P_{no} \times 2 + P_{ag} \times 3 + P_{sa} \times 4$, where P_{da} is the percentage of respondents who disagree; P_{no} is the percentage of respondent with no opinion; P_{ag} is the percentage of respondents who agree; and P_{sa} is the percentage of respondents who strongly agree. The PI score ranged from 100 to 400 in each individual statement, where a score of 100 indicated the most unfavorable perception and 400 indicated the most favorable perception on the effectiveness of FINA.

Problems faced during FINA program were computed on the basis of the twenty selected problems in the interview schedule. The answers of the respondents were scored as "very high," "high," "little," or "not at all." Weight was assigned to each response from 0 to 3, where 0 means not at all, 1 means little, 2 means high, and 3 means very high. The problem confrontation indices (PCI), along with rank order, was computed using the following formula: $PCI = P_{no} \times 0 + P_{lo} \times 1 + P_{hi} \times 2 + P_{vh} \times 3$, where, P_{no} is the percentage of respondents with no problem, P_{lo} is the percentage of respondents with a *little* problem, P_{hi} is the percentage of respondents with a problem classified as *high*; and P_{vh} is the percentage of respondent with a problem classified as *very high*. The value of the PCI score ranged from 0 to 300, where, score 0 indicated no problem at all and 300 indicated a *very high* problem in conducting the FINA program. Mean, standard deviation and co-efficient of correlation (r) were computed to test the hypothesis.

Results

Characteristics of Farmer

The age of the farmers ranged from 25 to 85 years, with average 51.6 (Table 2). The results revealed that the highest portion of FINA-participating farmers (52.5%) were middle aged, whereas a very low portion of farmers (12.5%) were young aged. The data noted that middle-aged farmers actively participated in farming activities. However, young farmers did not actively participate in their farming activities. The correlation data (Table 3) showed a significant negative relationship between age of the farmers and their perception on FINA. Perhaps, the older, experienced farmers felt that they did not need the services of FINA as much as the younger farmers did. Educational qualification of the farmers ranged from 0 to 14 with average 7.2. The data indicated that a major portion of the farmers (47.5%) was grouped as having secondary education. The data further showed that a very low portion (2.5%) of the farmers who participated in the FINA program were illiterate. The results showed that primary and secondary education farmers were higher participations in the FINA program than illiterate farmers. These higher rates of participation indicated their active participation because they were facing some problems and wanted to find the solutions from the FINA program. Therefore, a significant positive relationship occurred between education of farmers and their perception on FINA. Educated farmers believed that FINA is effective in identifying their problems and providing targeted solutions. On the other hand, the highest portion (60.8%) of the farmers had a medium-sized family. The data suggested that medium-sized families had positive attitudes on the effectiveness of FINA regarding their farming problems compared to small and large-sized families. However, the data overall showed no significant relationship between family size and farmers' perception of the effectiveness of FINA. The largest part of respondents (62%) owned small-sized farm. The correlation data showed a significant relationship between farm size and their perception on FINA. The results noted that farmers of small farm sizes were more motivated than big farmers. This is because small-sized farm operators want to develop their production efficiently using modern technologies and inputs. They believe that FINA is the effective way to identify their problems and to find solutions. Annual income was a great factor for farmers' perceptions. The results showed a significant relationship between incomes of the farmers and their perceptions of FINA. The highest portion (49%) of the respondents were medium-income farmers. Farmers with moderate to high income participated more in FINA than low-income farmers. Farmers who were not economically stable had low participation in FINA, perhaps because they might be involved in other income-generating activities during the FINA program.

Table 3. Co-efficient of Correlation (r) Between the Dependent Variables of Farmers' Perception of the Effectiveness of FINA and Independent Variables

Dependent variable	Independent variable	'r' value
Farmers' perception on the effectiveness of FINA	Age	-.27**
	Educational qualities	.20*
	Family size	-.06^{NS}
	Farm size	.18*
	Annual income	.19*
	Organizational participation	.01^{NS}
	Cosmopoliteness	-.10^{NS}
	Extension medial contact	.37***
	Farming experience	-.17^{NS}
	Farming facilities	.21*
	Innovativeness	.15^{NS}
	Agricultural knowledge	.26**

^{NS}Nonsignificant; *, **, ***Significant at 0.05, 0.01, 0.001 respectively.

Organizational participation (74.2%), cosmopoliteness (56.7%), extension media contact (47.5%), farming experience (41.7%), farming facilities (64.2%), innovativeness (47.5%), and agricultural knowledge (54.2%) were characteristics of the majority of farmers participating in the FINA (Table 2). Farmers who had higher contact with extension media and high agricultural knowledge had better perceptions of the effectiveness of FINA than farmers with lesser exposure to extension information. A similar study supported the idea that extension media contact helped farmers in gaining knowledge about fertilizer application and influenced the adoption of chemical fertilizer in Mozambique (Cavane, 1993).

The data further showed a significant relationship (Table 3) of extension media contact, farming facilities, and agricultural knowledge of farmers with their perception of FINA. However, organizational participation, cosmopoliteness, farming experience, and innovativeness had nonsignificant relationships with perception of FINA. The results showed that farmers with agricultural knowledge participated willingly because they knew FINA was the way to get their problems solved. Additionally, in the FINA extension program, Agricultural Extension Officer (AEO) and BSs are actively involved so that farmers concentrated in the meeting and got more answers about farming problems directly from extension officer

Table 4, Distribution of Farmers' Perception on the Effectiveness of FINA In a Potential Scoring Range of 15 to 60 (n=120).

Perception term	Categories	Farmers (No.)	(%)
Providing extension services	Slightly favorable perception (20 to 30)	32	27
	Moderately favorable perception (31 to 40)	55	46
	Highly favorable perception (41 to 49)	33	28
	Mean	**36**	
Adopting recommended agricultural practices	Slightly favorable perception (20 to 30)	25	21
	Moderately favorable perception (31 to 40)	53	44
	Highly favorable perception (41 to 53)	42	35
	Mean	**37**	

Farmers' Perception of the Effectiveness of FINA

Farmers' perception of the effectiveness of FINA in terms of providing extension services ranged from 20 to 49 against a range limit of 15 to 60, with an average score of 36. The highest portion of respondents (46%) was moderately favorable in this regard (Table 4). However, perception indices (PI) on fifteen selected statements ranged from 197 to 307 against a range limit of 100 to 400 (Table 5). According to rank order of PI, the most favorable perception statement was "develop a good relationship between farmers and extension workers due to FINA," whereas the lowest perception statement was "DAE conduct total extension activities based on responsiveness of farmers needs."

Farmers' perception of the effectiveness of FINA in terms of adopting recommended agricultural practices ranged from 20 to 53 against a potential range of 15 to 60, with an average of 37. A large portion (44%) of the respondents was moderately favorable toward adopting recommendations (Table 4). However, perception indices (PI) on fifteen statements in this regard ranged from 131 to 322 against a potential score of 100 to 400 (Table 6). According to the rank order of PI, the most favorable perception statement was "information gained about importance of organic manure application to the field due to FINA program," whereas the lowest perception statement was "knowledge gained about modern irrigation management through FINA."

Table 5. Following Statements Related to the Effectiveness of FINA on Farmers' Perception Indices (PI) and Rank Order (RO) in Terms of Providing Extension Services (n=120)

SL No	Statements	PI	RO
1	Develop a good relationship between farmers and extension workers due to FINA	307	1
2	Increased familiarity with different information media through FINA	305	2
3	Farmers can obtain rapid solutions of their identified problems from the extension workers through FINA	294	3
4	Increased accountability of the extension workers to the farmers due to FINA	288	4
5	Opportunity given to the farmers in participating to the different extension activities through FINA	283	5
6	Increased visits and monitoring of the extension workers to the farmers field due to FINA	279	6
7	Increased communication linkage of the farmers with different extension offices due to FINA	250	7
8	Ensure demand driven extension services of the farmers due to FINA	249	8
9	Decreased the cost of production of the farmers due to FINA	247	9
10	Farmers can participate more in different training activities through FINA	246	10
11	Farmers can reach the proper target of production through FINA	236	11
12	Farmers can identify their actual needs and problems through FINA	235	12
13	Farmers can use necessary practices for their farm due to participation in FINA	232	13
14	Increased familiarity of different extension methods to the farmers through FINA	207	14
15	DAE conduct total extension activities based on responsiveness of farmers needs	197	15

The overall perception of farmers on the effectiveness of FINA was that nearly half of the farmers (44%) responded moderately favorable (Figure 2). These data show that the FINA program was somewhat effective in providing extension services and encouraging farmers to adopt recommended agricultural practices. Nearly one third of

the farmers (32%) perceived the FINA program as highly favorable, but one fourth of the farmers (24%) perceived the FINA program as slightly favorable in providing extension services and adopting recommended agricultural practices. The data further revealed that extension service programs of FINA appeared not highly effective in identifying all agricultural problems and their solutions but found potential in solving some specific problems ranked in Table 5 & 6. The results further suggest rapport communication of agricultural extension officials to the farmers for increasing efficiency of FINA program.

Problem Confrontation in Implementing FINA

Problem confrontation indices (PCI) of the farmers according to the selected twenty problems (Table 7) in implementing FINA program PCI ranged from 114 to 270 in a possible range of 0 to 300. According to the rank order of PCI, "lack of adequate allowance for the participating farmers" was ranked at the top. However, "lack of coordination of the BSs with farmers in implementing FINA" was ranked at the bottom. The data showed some of the problems that were hindering the effectiveness of the FINA program. Farmers

Table 6. Farmers' perception indices (PI) and rank order (RO) in terms of adopting recommended agricultural practices by FINA (n=120).

SL No.	Statements	PI	RO
1	Information gained about importance of organic manure application to the field due to FINA programs	322	1
2	Knowledge increased about high yielding varieties of rice through FINA	315	2
3	Knowledge gained on high yielding potato cultivation through participating in FINA	297	3
4	Eagerness increased in cultivating fruits and vegetables to the homesteads through FINA	292	4
5	Information gained about modern techniques of jute cultivation due to FINA	290	5
6	Knowledge gained about seed production and management of vegetable crops due to FINA	283	6
7	Knowledge increased about pesticide application to the field due to participating in FINA	270	7
8	Knowledge gained about balanced fertilizers application to the field due to participating in FINA programs	248	8
9	Information gained about the reasons of Zn-fertilizers application due to FINA	246	9
10	Knowledge increased about homestead gardening techniques through FINA	242	10
11	Information obtained about methods of compost fertilizers preparation through participating in FINA	237	11
12	Knowledge gained about use of IPM to the field through participating in FINA	231	12
13	Knowledge gained about 'guti-urea' application due to participating in FINA	226	13
14	Information gained about cultivating green manure crops to the fields due to FINA	155	14
15	Knowledge gained about modern irrigation management through FINA	131	15

in rural areas did not have appropriate socio-economic conditions for active participation in FINA; consequently, they were busy in farming activities. They needed some extra

incentives for active participation in the FINA program and, hence, had lack of interest in participating in such programs.

Conclusion, Recommendations and Implications

The results revealed farmers' perception of the effectiveness of FINA. Data about farmers' characteristics revealed categories of the farmers who actively participated in the FINA program. Seven personal characteristics of farmers showed a significant relationship with farmers' perceptions of the effectiveness of FINA. Five characteristics of farmers did not show any relation with farmers' perception. Nearly half of the farmers showed a moderately favorable perception of the effectiveness of FINA. On the other hand, only a quarter of the farmers showed a highly favorable perception. Also, a quarter of the farmers showed a less favorable perception on FINA. Precisely half of the farmers perceived that FINA is effective in providing extension services. Hence, more extension work is recommended to achieve a goal of two thirds of the farmers having a favorable perception of FINA. The study revealed many of the problems that inhibit the success of the FINA program. It is suggested that the extension officers and field extension workers, including other agricultural supporting organizations, should concentrate on addressing the uppermost problems of the farmers.

More studies are needed to explore how the FINA extension program can be more effective for farmers. These results encourage future studies on the following points: (a) the scope of developing other techniques of FINA that can be employed through using training demonstration for farmers' educational progress, (b) problems that prevail in rural Bangladesh in the use of FINA and ways to overcome them, and (c) future prospects of FINA in Bangladesh.

Table 7. Problems Confrontation Indices (PCI) and Rank Order (RO) Faced During Implementing FINA Program (n=120)

SL No.	Problems	PCI	RO
1	Lack of adequate allowance (salary) for the participating farmers	270	1
2	Lack of good quality seed supply	241	2
3	Low market price of agricultural products	238	3
4	Disagree to attend in FINA meeting at distant places for high communication expense	236	4
5	High price of agricultural inputs, like seeds, fertilizers and insecticides	230	5
6	Lack of much remuneration and rewards for the participating farmers	227	6
7	Farmers don't want to spend enough time in FINA meeting	218	7
8	Lack of enough knowledge about FINA	206	8
9	Lack of eagerness of the BSs in conducting FINA due to insufficient budget	202	9
10	Lack of getting urgent solution of the identified needs of farmers	188	10
11	Farmers don't want to be present in the FINA meeting in a group	181	11
12	Lack of importance in collecting information from small and marginal farmers	175	12
13	All participant farmers don't express their opinion in the FINA session	157	13
14	Lack of proper knowledge about new technology	150	14
15	Inability to understand the FINA discussion meeting due to illiteracy	147	15
16	Lack of adequate places and environment for conducting FINA	130	16

	program		
17	Negligence of BSs responsibilities in conducting FINA	128	17
18	Farmers aren't aware about their needs	126	18.5
19	Irresponsibility of the BSs in explaining the importance of the FINA to the farmers and its justification	126	18.5
20	Lack of coordination of the BSs with farmers in implementing FINA	114	20

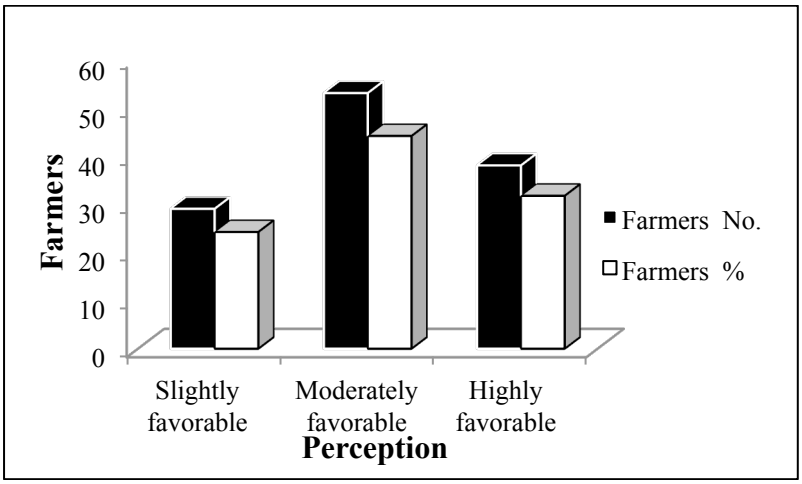

Fig 2: An overall distribution of farmers' perception of the effectiveness of FINA.

Acknowledgment

We thank the FINA farmers who spared their time to be participants of this study. The encouragement of Professor A. K. M. Ziaul Karim, Department of Agricultural Extension Education, Bangladesh Agricultural University is acknowledged. Specially remembered is Dr M. H. Rashid, the co-author, for his interest in this study and the University of Massachusetts Amherst for providing publication funding.

References

Anonymous. (2000, April 2). Agricultural and economic condition of Bangladesh, *The Daily Ittefaq,* p. A3.

Bartholomew, H. M. (1994). The world's largest extension system. *Journal of International Agricultural and Extension Education, 1*(1), 32-36.

BBS. (2000). *Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics*. Dhaka, Bangladesh: Government Printing Office.

Birkhaeuser, D., Evenson, R. E., & Gershon, F. (1991). The economic impact of agricultural extension: A review. *Economic Development and Cultural Change, 39*(3), 607-650.

Cavane, E. (1993). *Farmers' attitude and adoption of improved maize varieties and chemical fertilizers in Mozambique.* Paper presented at the African Crop Science Conference Proceedings.

DAE. (1999). *Agricultural Extension Manual (Revised edition), The Department of Agricultural Extension*. Dhaka, Bangladesh: Government Printing Office.

Deep, S. D. (1978). *Human Relation in Management*. Encino, California: Glencoe Publishing Co.

Dejene, A. (1989). The training and visit agricultural extension in rainfed

agriculture: Lessons from Ethiopia. *World development, 17*(10), 1647-1659.

Enos, J. L. (1989). Transfer of technology. *Asian-Pacific Economic Literature, 3*(1), 2-36.

Feder, G., & Slade, R. (1986). The impact of agricultural extension: The Training and Visit system in India. *The World Bank Research Observer, 1*(2), 139-161.

FFYP. (1998). *Fifth Five Year Plan (1998–2002), Ministry of Planning*. Dhaka, Bangladesh: Government Printing Office.

Islam, M. R. (1998). *Effectiveness of Mati-O-Manush television program in disseminating agricultural informaition to the television viewer farmers.* (Master's thesis), Bangladesh Agricultural University, Mymensingh, Bangladesh.

Kerlinger, F. N. (1973). *Foundation of Behaviorral Research*. Delhi: Surject Publication.

Mahtab, F. U., & Karim, Z. (1992). Population and agricultural land use: Towards a sustainable food production system in Bangladesh. *Ambio, 21*(1), 50-55.

Muttaleb, M. A., Hussain, M. A., & Rashid, M. A. (1998). Adoption level and its constraints to selected recommended potato technology. *Bangladesh Journal of Training and Development, 11*(1 & 2), 101- 108.

Pretty, J. N., & Chambers, R. (1993). Towards a learning paradigm: New professionalism and institutions for agriculture. In J. M. Harris (Ed.), *Rethinking sustainability: Power, knowledge, and institutions* (pp. 189-221). Michigan: The University of Michigan Press.

Rajaguru, G. S., & Satapathy, C. (1971). Effectiveness of sources of information in the adoption of high yielding varieties by the farmers of Puri District of Orissa. *Indian Journal of Extension Education, 7*(1), 88-89.

Reynar, R., & Bruening, T. (1996). Agricultural Extension Issues: Perceptions of Bangladesh T&V Extension Personnel. *Journal of International Agricultural and Extension Education, 3*(1), 53-62.

Reynar, R., Musser, F., & Bruening, T. (1996). The Potential for Linking Private and Public Extension Services in Bangladesh. *Journal of International Agricultural and Extension Education, 3*(2), 5-14.

Rogers, E. M. (1995). *Diffusion of innovations*. New York, NY: The Free Press.

Sarker, M. M. R. (1996). *Effectiveness of agricultural information disseminated to the farmers through agricultural radio programs.* (Master's Thesis), Bangladesh Agricultural University, Mymensingh, Bangladesh.

Stone, B. B. (1997). A system's approach to professional development. *Journal of Extension, 35*(2), 1-3.

Suryanarayana, R., Rao, R. N., & Hussain, S. M. (1990). Effectiveness of contact farmers in Training and Visit system. *Indian Journal of Extension Education, 26* (1 & 2), 82-84.

Tripathy, S. L., & Panday, L. R. (1967). Comparative effectiveness of the extension teaching Methods in C. D. block. *Indian Journal of Extension Education, 16*(1 & 2), 47-49.

doi: *10.5191/jiaee.2013.20204*

Farmer Innovativeness and Hybrid Maize Diffusion in Thailand

Sutthiporn Poolsawas
Department of Agricultural and Resource Economics
Faculty of Economics, Kasetsart University
Bangkok 10900 Thailand
Center of Advanced Studies for Agriculture and Food
KU Institute for Advanced Studies, Kasetsart University: (CASAF, NRU-KU)
Bangkok 10900 Thailand
Tel: +662-5798547
Fax: +662-9428047
s.poolsawas@gmail.com

Orachos Napasintuwong
Department of Agricultural and Resource Economics
Faculty of Economics, Kasetsart University
Bangkok 10900 Thailand
Center of Advanced Studies for Agriculture and Food
KU Institute for Advanced Studies, Kasetsart University: (CASAF, NRU-KU)
Bangkok 10900 Thailand
Tel: +662-5798547
Fax: +662-9428047
orachos.n@ku.ac.th

Abstract

Hybrid maize in Thailand is one example of successful technology dissemination in a developing country. The first hybrid maize variety was released in 1982 by a public research institute, but did not become rapidly adopted until the privatization of the seed market in the early 1990s.Previous studies on the adoption of hybrid maize in Thailand mainly analyzed factors influencing the adoption decision, but none evaluated the timing of the adoption process. This study reveals the diffusion pattern of hybrid maize varieties and categorizes farmers by the time of adoption. It was hypothesized that different categories of farmers would differ in their innovativeness. The results show that the distribution of hybrid maize adoption in Thailand approaches a normal distribution consistent with the literature. Younger and less educated farmers with larger households and farm size tended to adopt hybrid maize faster than others. Furthermore, social activities, extension services, private company promotion programs and access to information on hybrid varieties played important roles in the adoption lag.

Keywords: Technology Diffusion, Technology Adoption, Hybrid Maize, Innovativeness, Communication Channels