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Empowering Farmers through the Farmers' Field School Approach: A Constructive Pathway to Knowledge Acquisition

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Abstract

Enhancing farmers' knowledge through the Farmers' Field School (FFS) approach is vital for boosting agricultural production. This study aimed to evaluate farmers' knowledge acquisition through the FFS approach and identify the factors influencing it. The research was conducted in the Saidpur Upazila (sub-district) within the Nilphamari district of Bangladesh. Face-to-face interviews were held with 75 FFS farmers, selected randomly as participants for the study. Data collection occurred from April to May 2025. Farmers' understanding of the FFS approach served as the dependent variable and was measured using 18 questions aligned with six levels of Bloom's revised taxonomy of the cognitive domain. The results categorized farmers' knowledge into low, medium, and high levels: 61.3% of respondents demonstrated medium knowledge, 36% exhibited high knowledge, while only 2.7% displayed low knowledge. Descriptive statistics (number, percent, mean, standard deviation) and inferential statistics (correlation and regression analysis) were employed to evaluate knowledge acquisition and identify the factors influencing it. Key factors influencing this knowledge included age, education level, family size, farming experience, farm size, annual family income, organizational involvement, social mobility, and contact with extension media. Multiple linear regression analysis revealed that age, education level, and farming experience significantly impacted farmers' knowledge levels. It is essential for relevant authorities, particularly the Department of Agricultural Extension (DAE), to implement further initiatives to support farmers and improve their knowledge. Additionally, increasing institutional support and providing follow-up assistance are crucial for maximizing the long-term benefits of FFS training.

Keywords
Farmers Empowerment, Knowledge Acquisition, FFS Approach, Bangladesh agriculture

1. Introduction

The Farmers Field School (FFS) is a training approach that teaches farmers practical, science-based agricultural skills. Initiated by the FAO in the late 1980s, it now covers pest control, soil fertility, and sustainable methods (Van den Berg et al., 2020). The FFS model promotes experiential learning in group settings, encouraging collaboration where farmers participate in hands-on experiments and improve their ability to adapt to changing conditions. Studies show that farmers who attend FFS are more likely to adopt sustainable practices, leading to higher crop yields, less pesticide use, and better profits (Akter et al., 2023). While FFS has the potential to enhance farming techniques, pest management, soil health, and climate resilience, its success depends on farmers' perceptions, knowledge, and willingness to apply recommended practices (Davis et al., 2012). Several obstacles, including low literacy, financial issues, and insufficient government support, often hinder farmers from fully participating in FFS programs (Ahmed et al., 2019).

In Bangladesh, where almost 40% of the population depends on farming (Uddin et al., 2024; BBS, 2021), the government has made significant strides by partnering with organizations like the UNDP and FAO to implement extensive FFS initiatives aimed at improving farmers' technical skills. Many smallholders have limited access to extension services, leading to a lack of knowledge about innovative farming methods (Rahman et al., 2025; Rahman et al., 2020). Farmers face challenges such as low soil fertility, pest outbreaks, unpredictable rainfall, and climate

variability (Hasan et al., 2021). A key benefit of FFS is the promotion of peer-to-peer learning, enabling farmers to collaboratively observe and evaluate field experiments. Research indicates this method greatly enhances farmers' understanding of pest control, soil health, and water conservation (Jiggins and Van den Berg 2020).

Although the Department of Agricultural Extension (DAE) has actively promoted FFS in rural areas to boost smallholder resilience and productivity (BBS, 2022), a gap remains between trained and untrained farmers, leading to unequal adoption of improved practices (Hasan et al., 2021). The gap between theoretical training and real-world application is a major issue for Bangladesh's FFS efforts (Davis et al., 2012). Despite widespread FFS implementation, many farmers only acquire basic knowledge and struggle to apply or interpret what they learn. In Saidpur Upazila, factors like limited education, poor follow-up, and social barriers hinder the effective use of FFS practices. Additionally, the influence of factors such as age, experience, and access to media on farmers' knowledge is not well understood, which hampers efforts to enhance training results. This study aims to assess farmers' knowledge gained through FFS, identify factors influencing this knowledge, and examine the challenges faced by FFS farmers working within this framework.

1.1 Review of literature

The FFS, first introduced in Southeast Asia by the Food and Agriculture Organization (FAO) in the late 1980s, aims to empower farmers to become experts in their fields rather than passive recipients of top-down agricultural advice (Jiggins and Van den Berg 2020). Participants in FFS generally scored higher on knowledge assessments compared to non-participants, as shown in a meta-analysis by Waddington et al., (2014) covering 30 countries. Davis et al., (2012) found that East African farmers attending FFS could correctly identify insect life cycles and implement integrated management techniques. Similar findings in Indonesia, where Feder et al., (2004) observed that farmers retained more information two years after training, suggest that FFS significantly enhances farmers' technical skills in various agricultural practices.

Bangladesh has also implemented the FFS model through several government and donor-funded initiatives. Research by Rahman and Sarker (2020) indicated that farmers in northern Bangladesh who participated in FFS could accurately identify beneficial insects. Likewise, women involved in FFS programs effectively applied organic pest management strategies, as reported by Ahmed et al., (2019). Another study by Islam et al., (2022) noted that FFS participants adopted sustainable pest management techniques. Younger farmers retained FFS-taught skills more effectively than older farmers, according to Davis et al., (2012). Additionally, Feder et al., (2004) observed that literate farmers tend to apply their knowledge more frequently than their illiterate counterparts within the FFS framework.

1.2 Conceptual framework of the study

The focus of this study is knowledge acquisition of farmers through the FFS approach. The selected personality variables, socio-economic characteristics, and communication behaviors of the respondents, including age, level of education, family size, farming experience, farm size, annual family income, family cooperation, daily time allocation, credit received, organizational participation, social mobility, and contact with extension media, may influence the knowledge of the FFS farmers. Having appropriate knowledge is essential for FFS farmers, as it leads to better persuasion, decision-making, implementation, and confirmation, ultimately improving their production. This knowledge enables them to make informed decisions regarding the accurate use of various chemicals in their fields. Consequently, in the long term, this will increase production and enhance their economic stability. It is hypothesized that the various opportunities provided by different agencies, including governmental organizations (GOs) and non-governmental organizations (NGOs), will contribute to increasing the knowledge of FFS farmers. The conceptual framework for this study is illustrated in Figure 1.

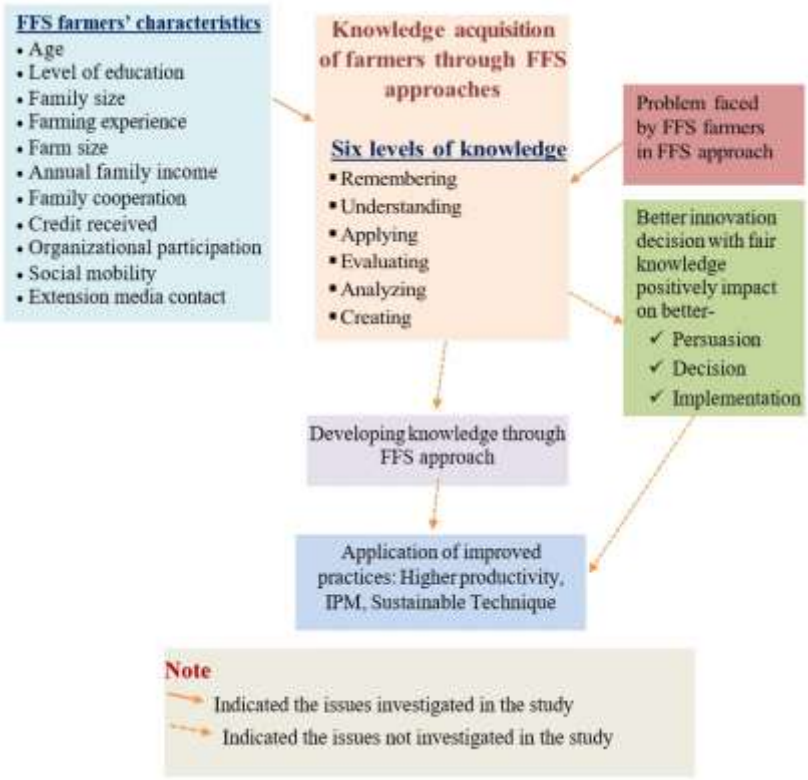

Figure 1. Conceptual Framework of the Study

2. Materials and Methods

2.1 Study Area

The study was carried out in Kamar Pukur Union, Saidpur Upazila, in the Nilphamari district of Bangladesh (Figure 2). This area was chosen intentionally because the FFS approach is practiced there. Before participating in this approach, farmers were unaware of various modern techniques. After completing the sessions, they are now able to apply this knowledge in their fields to boost production and income. The selection was based on recommendations from the Upazila Agricultural Officer and the Agriculture Extension Officer of Saidpur Upazila.

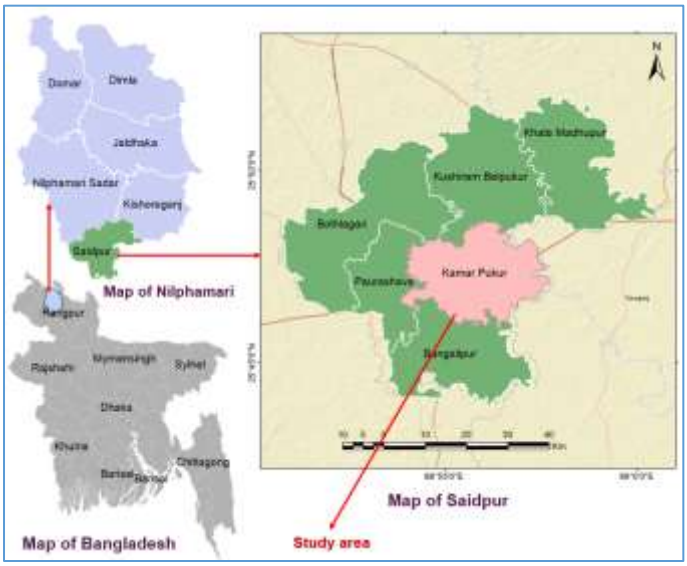

Figure 2. Map of the study area

2.2 Population, sampling, and procedures of data collection

The total population of FFS farmers in Kamar Pukur union, under Saidpur Upazila, was documented. With the help of the Sub-Assistant Agriculture Officer (SAAO), a list of farmers was compiled. The study targeted a total of 480 farmers. A random sampling method was employed to select FFS farmers from each village, resulting in a sample of 75 farmers from the population. An organized interview schedule was carefully designed to align with the study's objectives, ensuring reliable and accurate data collection. Data was gathered using various scales and simple, easy-to-understand questions, including both open- and closed-ended formats. The interview schedule was pre-tested with 10 FFS farmers to identify and address any problematic questions, leading to necessary adjustments. The interview schedule was designed to gather comprehensive information and was organized into three main sections: (i) socio-economic characteristics of the respondents; (ii) knowledge acquisition of farmers through the FFS approach, the core variable of the study; and (iii) the problems faced by FFS farmers. Additionally, relevant secondary information was gathered from books, journals, theses, official reports, and credible online sources to support and complement the study findings.

2.3 Measurement of farmers' knowledge gained through FFS

The dependent variable of the study, knowledge acquisition of farmers through the FFS approach, was measured by using modified Bloom's Taxonomy of Cognitive Domain (Anderson and Krathwohl, 2001). To have an appropriate understanding of the comparative knowledge of the farmers, a knowledge index was computed. Therefore, six indices for six levels were computed. As the number of questions were 18 under the six levels was not the same, the sum of the computed scores for each of these levels was also different. Hence, the standardized knowledge index (SKI) for a level of knowledge was determined by the following formula:

SKI = CS/PS X 100, Where,

SKI = Standardized knowledge index for a specific level

CS = Sum of the computed scores for a level of knowledge obtained by all the farmers

PS = Sum of possible scores for a level of knowledge of all the farmers

Possible SKI for a level of knowledge could range from 0 to 100, while 0 indicates no knowledge and 100 indicates very high knowledge.

2.4 Measurement of the relationship between variables

To determine whether there is a connection between the socio-economic qualities of farmers and knowledge gained through the FFS, Karl Pearson's Product-Moment Correlation Coefficient (r) was employed. Karl Pearson's Product-Moment Correlation Coefficient (r) for an individual can be calculated using the following equation:

$$r_{xy} = \frac{\sum(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum(x_i-\bar{x})^2\sum(y_i-\bar{y})^2}}$$

Here,

r_{xy} = The value of the Pearson correlation between the two variables x and y

x_i = Experiment x-values $\bar{x}$ = Mean of x-variable values y_i = Experiment y-values $\bar{y}$ = Mean of y-variable values

2.5 Measurement of the factors affecting the knowledge of farmers gained through FFS

To identify the key factors influencing the knowledge of farmers gained through FFS, multiple linear regression analysis was utilized. The multiple regression model used in the study is as follows:

$$Y=\beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4+\beta_5 X_5+\beta_6 X_6+\beta_7 X_7+\beta_8 X_8+\beta_9 X_9+\beta_{10} X_{10}+\beta_{11} X_{11}+e$$

Where,

Y = Dependent variable (knowledge of farmers gained through FFS), β0 = Regression coefficient,

X = Independent variables viz. X_1 = Age, X_2 = Educational level, X_3 = Family size, X_4 = Farming experience, X_5 = Farm size, X_6 = Annual family income, X_7 = Family cooperation, X_8 = Credit received, X_9 = Organizational participation, X_{10} = Social mobility, X_{11} = Extension media contact, and e = Error term.

2.6 Measurement of the problems faced by the FFS farmers

A four-point rating scale was used to assess the extent of problems experienced by each FFS farmer. Nine (9) key problems were identified through FGDs and a review of relevant literature. Each problem was rated using four response options: high problem (3), medium problem (2), low problem (1), and not at all (0). Thus, individual scores could range from 0 to 27, where 0 indicates no problem and 27 indicates the highest level of problem. Based on the total score, the extent of problems was categorized as low (0-9), medium (10-18), or high (above 18). A similar approach was followed by Uddin et al., (2024), Kowsari et al., (2022), Mithun et al., (2018), and Das et al., (2020).

To identify the most critical issues, a rank order of the problems was made by calculating the Problem Facing Index (PFI) for each problem using the formula adapted from Sheheli et al., (2023), Kowsari et al., (2022), Mithun et al., (2018), and Das et al., (2020):

$PFI= (P_h\times3) + (P_m\times2) + (P_l\times1) + (P_n\times0)$ Where,

PFI = Problem Facing Index, P_h = number of farmers with high problems, P_m = number of farmers with medium problems, P_l = number of farmers with low problems, and P_n = Number of farmers with no problems.

2.7 Analysis of data

The collected data from the questionnaire surveys were coded and processed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA). Descriptive statistics, including frequency, mean, and standard deviation, as well as inferential statistical analyses, such as correlation analysis and multiple linear regression, were conducted using the Statistical Package for the Social Sciences (SPSS v.25).

3. Results and Discussion

3.1 Socio-demographic features of the FFS farmers

The socio-demographic characteristics of the FFS farmers are summarized in Table 1. It shows that the largest segment of the population (38.7%) falls within the middle-aged category, specifically those aged 36 to 55 years, followed by 32% in the old-aged category, 29.3% in the young-aged category. The educational attainment levels reveal that a significant number of individuals (32%) have completed primary schooling (1-5 years), indicating a foundational level of education. Most individuals (72%) belong to medium-sized families, defined as having 5 to 7 members, which can influence social dynamics and resource sharing.

Table 1. Socio-demographic features of the FFS farmers

Characteristics	Scoring system	Categories	Percent	Mean	SD*
Age	Actual years	Young-aged (18-35)	29.3	44.23	13.388
		Middle-aged (36-55)	38.7		
		Old aged (>55)	32		
Educational level	Years of schooling	Illiterate (0)	16	6.59	4.547
		Primary (1-5)	32		
		Secondary (6-10)	30.7		
		Above secondary (>10)	21.3		
Family size	Number of members	Small (up to 4)	9.3	6.37	1.531
		Medium (5-7)	72		
		Large (>7)	18.7		
Farming experience	Years	(Up to 10) years	52	15.44	10.210
		(11-20) years	34.7		
		(>20) years	13.3		
Farm size	Hectare	Small (0.2 to1.0)	41.3	0.269	0.374
		Medium (1.01-3.0)	44		
		Large (above 3.0)	14.7		
Annual family income	'000' Tk	Low (up to 150)	46.67	248.34	165.66
		Medium (151-300)	33.33		
		High (>300)	20		
Family cooperation	Score	Low (up to 2)	8	5.266	1.70
		Medium (3-4)	16		
		High (>4)	76		
Credit received	'000' Tk	Low (up to 30)	64	38.84	62.81
		Medium (31-60)	28		
		High (above 60)	8		
Organizational participation	Score	No involvement	0	1.84	1.30
		Low (up to 8)	90.67		
		Medium (9-16)	9.33		
		High (>16)	0		
Social mobility	Days	No mobility (0)	1.34	3.96	2.7
		Low (up to 4)	45.32		
		Medium (5-8)	53.34		
		High (> 8)	0		
Extension media contact	Score	Low (1-9)	21.3	15.08	5.05
		Medium (10-18)	60		
		High (>18)	18.7		

SD*= Standard Deviation

A notable 52% of individuals have up to 10 years of farming experience, showcasing a community that possesses essential agricultural skills. Additionally, the majority (81.3%) manage small farms (up to 0.15 hectares) or medium-sized farms (0.16-0.30 hectares), indicating a landscape dominated by smallholder agriculture. The income distribution suggests that a significant majority (46.67%) of families fall within the low-income bracket (up to 150,000 Tk), which limits opportunities for investment and growth.

There is a strong trend of family cooperation, with 76% of individuals reporting collaborative efforts within households. However, a majority of farmers (64%) indicate they receive low amounts of credit (up to 30,000 Tk), highlighting limited access to financing that could support agricultural improvements or enhance livelihoods.

Table 1 also emphasizes a significant lack of organizational involvement, with 90.67% of individuals categorized as having low participation. This trend reveals a gap in community engagement and access to organizational resources. The data shows that most individuals (53.34%) experience medium social mobility, suggesting systemic barriers to progress within the community. Finally, patterns of engagement with extension media indicate that a majority (60%) have moderate levels of contact with agricultural information channels, pointing to potential areas for improving access to educational resources.

3.2 Different levels of knowledge of the FFS farmer

The data depicted in Figure 3 provides a detailed assessment of farmers' knowledge levels concerning the Farmer Field School (FFS) approach, segmented into six distinct cognitive domains: remembering, understanding, applying, analyzing, evaluating, and creating.

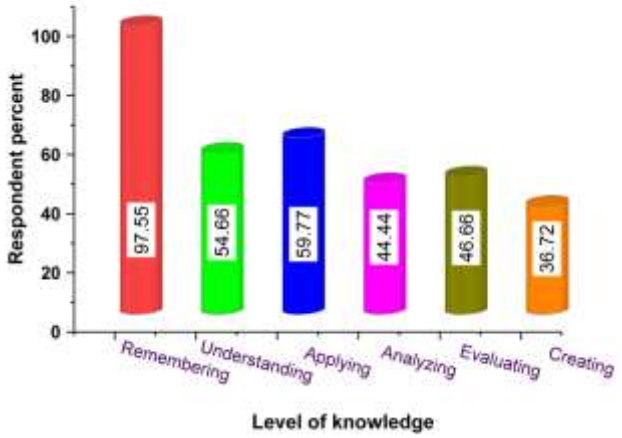

Figure 3. Level of farmers' knowledge gained through the FFS Approach

Remarkably, farmers demonstrated exceptional performance in the remembering category, achieving a striking score of 97.55%. This high score reflects their strong ability to recall information effectively. Their comprehension capabilities were also commendable, with an understanding score of 54.66%, indicating a solid grasp of the concepts presented. Faouque et al., (2025) reported that farmers with better memory can easily identify their farming problems and find appropriate solutions with the help of extension agents.

However, as we move into the higher-order cognitive levels, performance begins to wane. In the applying category, farmers achieved a score of 59.77%, showcasing a moderate level of proficiency in utilizing their knowledge in practical scenarios. The analysis category revealed an even steeper decline, with a score of 44.44%, suggesting that farmers faced challenges in breaking down and interpreting complex information.

The evaluation and creation categories presented the most significant hurdles. With a score of 46.66% in evaluating, farmers struggled to apply critical thinking skills to assess situations effectively. Even more pronounced was their difficulty with creating, where they scored a mere 36.72%. This low score highlights substantial challenges in generating innovative solutions and new ideas, emphasizing a critical area for further development and support in fostering their analytical skills.

3.3 Category of the FFS farmers according to their knowledge

Data presented in Figure 4 indicated that approximately 61.3% of farmers had a medium level of knowledge, while 2.7% had low knowledge, and 36% had high knowledge. Most respondents had limited formal education; however, their extensive farming experience contributed to their medium knowledge level. Similar findings were reported by Islam et al., (2019), who noted that 46.1% of farmers also had medium knowledge levels. In contrast, Farouque and Sarker (2018) and Ghosh et al., (2020) found that 65% and 51.1% of farmers, respectively, had low levels of knowledge. Das et al., (2019) reported that 65% of farmers in their study had a high level of knowledge.

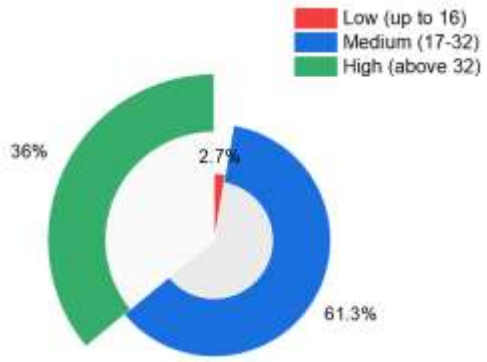

Figure 4. Categorization of the farmers according to their knowledge score on FFS

3.4 Relationship between the selected characteristics and the level of farmers' knowledge

To determine the knowledge acquisition of farmers through the FFS approach, Pearson's Product-Moment Coefficient of Correlation (r) was used. The results of the correlation coefficient test between the explanatory and focus variables are shown in Table 2.

Table 2. Results of the correlation analysis

Dependent variable	Selected Characteristics	Correlation coefficient (r)
Knowledge acquisition of farmers through the FFS approach	Age	-0.465**
	Level of Education	0.757**
	Family size	-0.249*
	Farming experience	-0.295*
	Farm size	0.253*
	Annual family income	0.460**
	Family cooperation	0.117
	Credit received	-0.145
	Organizational participation	0.405**
	Social mobility	0.403**
	Extension media contact	0.520**

**Correlation is significant at the 0.01 level of probability (2-tailed)
*Correlation is significant at the 0.05 level of probability (2-tailed)

Table 2 shows that out of eleven individual characteristics of the farmers, nine exhibited a significant correlation with their knowledge. Specifically, factors such as education level, farm size, annual family income, family cooperation, organizational participation, social mobility, and extension media contact had positive relationships. Conversely, age, family size, farming experience, and credit received showed negative correlations.

According to Table 2, the correlation coefficient between farmers' age and their knowledge gained through the FFS approach (r=-0.465**) indicated a significant negative relationship, suggesting that older farmers tend to have less knowledge about FFS. Younger farmers are more open to training and innovations, likely due to their familiarity with advanced strategies, making it easier for them to adopt the FFS approach.

Regarding education level, the correlation coefficient (r=0.757**) showed a significant positive relationship with knowledge acquisition through the FFS approach. Higher education facilitates better understanding and adoption of FFS practices because educated individuals can learn, accept, and implement new methods more easily. According to Mithun et al., (2020), education can improve technical proficiency and problem-solving abilities. Similar findings were reported by Sharmin & Hasan (2020).

The correlation between family size and knowledge gained through the FFS approach (r=-0.249*) was weak but significant. Larger families may limit the attention given by senior members to new approaches like FFS, as resources and focus are divided among family members. Sharmin & Hasan (2020) found similar results.

The correlation coefficient (r=-0.295*) between farming experience and knowledge indicated a significant negative relationship, suggesting experienced farmers may resist new methods, relying instead on traditional practices. Their confidence in their experience might hinder their acceptance of innovative approaches.

For farm size, the coefficient of correlation (r=0.253*) revealed a significant positive relationship with knowledge acquisition through the FFS approach. Larger farms motivate farmers to adopt improved practices, aiming to increase productivity by thinking bigger, as supported by Das et al., (2019) and Sharmin & Hasan (2020).

The correlation between annual income and knowledge (r=0.460**) showed that wealthier farmers have better access to training and extension services, making it easier for them to implement new methods, unlike poorer farmers who find it harder to adopt innovations.

Participation in organizational activities had a correlation coefficient (r=0.405**) indicating a strong positive relationship. Engagement in group programs promotes knowledge sharing, learning, and motivation to adopt new approaches.

Social mobility also showed a strong positive correlation (r=0.403**) with knowledge, implying that more socially mobile farmers tend to interact more, gain more knowledge, and broaden their outlook.

Finally, extension media contact had a high correlation (r=0.520**) with knowledge, signifying a significant positive relationship. Regular contact with diverse media sources facilitates learning and adaptation to the FFS approach, with extension services playing a crucial role in enhancing farmers' knowledge.

3.5 Factors influencing the farmers' knowledge acquisition through the FFS approach

To identify the factors that may influence farmers' knowledge through the FFS approach, a multiple linear regression analysis using the enter method was conducted (Table 3). The explanatory variables considered in this analysis included age, education level, family size, farming experience, farm size, annual family income, family cooperation, credit received, organizational participation, social mobility, and contact with extension media. The primary focus of the regression analysis was the knowledge acquisition of farmers through the FFS approach.

Table 3. Summaries of linear multiple regression analysis

Explanatory variables	Unstandardized Coefficients		Standardized Coefficients	t value	Sig. B
	β	Std. Error	Beta		
(Constant)	14.668	4.650		3.154	.002
Age	-.176	.080	-.365	-2.193	.032
Education	.699	.195	.493	3.590	.001
Family size	.125	.369	.030	.338	.737
Farming experience	.177	.086	.280	2.063	.043
Farm size	-.300	1.648	-.017	-.182	.856
Annual family income	.003	.003	.085	1.015	.314
Family cooperation	.262	.291	.069	.902	.370
Credit received	-.002	.007	-.023	-.316	.753
Organizational participation	.602	.460	.122	1.308	.196
Social mobility	.388	.266	.163	1.461	.149
Extension media contact	.233	.130	.183	1.790	.078
n=75, R=0.842, R^2=0.708, Adjusted R^2= 0.652, F=12.55					

The R-squared value obtained from the linear regression analysis was 0.708, with a corresponding F-value of 12.55, which was significant at the 0.001 level. The results of the multiple regression analysis revealed that key influencing factors included age, education level, and farming experience (Table 3). The adjusted R-squared value indicated that these three explanatory variables accounted for 65.2% of the variance in knowledge acquisition through the FFS approach.

The regression analysis showed that age was a significant factor with a negative correlation. Specifically, the results suggested that for each one-year increase in age, the knowledge gained through the FFS approach decreased by 0.176 units. This might imply that older farmers tend to rely more on traditional practices and are less likely to embrace new participatory learning methods such as FFS. They may have limited exposure to contemporary agricultural information sources or lesser motivation to alter long-established practices. Conversely, younger farmers may be more receptive to innovative, group-based learning opportunities. Similar observations have been noted in studies by Jiggins and Van den Berg (2020).

In contrast, the analysis indicated that the level of education was a significant factor showing a positive correlation. The results revealed that for each additional year of education, the knowledge obtained through the FFS increased by 0.699 units (refer to Table 3). Higher education typically broadens perspectives and enhances

observational, understanding, and decision-making skills in farming activities. This suggests that advancing educational levels significantly improves farmers' knowledge gained through the FFS approach, aligning with findings from Jiggins and Van den Berg (2020).

Furthermore, the analysis indicated that farming experience was also significant and displayed a positive trend. The findings showed that an increase in farming experience by one year corresponded to a 0.177 unit increase in knowledge obtained through the FFS approach. It appears that experienced farmers accumulate valuable insights over the years through trial and error, exposure to extension services, and peer interactions. They are likely to contrast FFS teachings with their past experiences, thus enhancing their understanding through reflective thinking. However, while experience plays a positive role, it does not diminish the significance of formal education or the willingness to embrace new methods. This finding is consistent with the results reported by Rahman and Parvin (2020).

3.6 Problems faced by the farmers with the FFS approach

After the observation, it was found that about 62.7% of farmers faced the selected problems to a low degree. About 37.3% of farmers faced the problems moderately. There was no farmer found who had not faced any serious problems. These findings align closely with the studies by Hoque et al., (2021) and Mithun et al., (2018), both of which documented that farmers in Bangladesh encountered moderate levels of obstacles in crop farming.

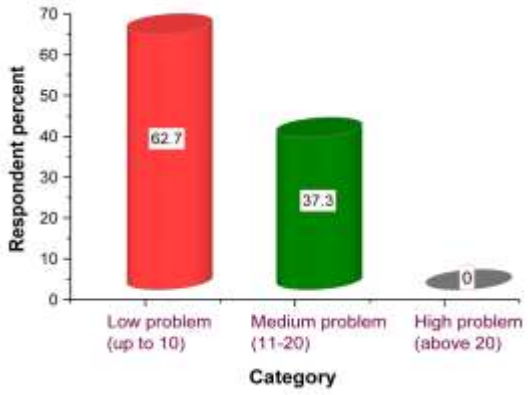

Figure 4. Category of the FFS farmers according to their problems

The extent of problems faced by farmers under the FFS approach, along with their rank-order values, is presented in Table 4. The problem facing index (PFI) was used to rank the problems.

Table 4. Rank order of problems faced by the farmers with the FFS approach

Statements	Extent of the problems				PFI	Rank order
	High (3)	Medium (2)	Low (1)	Not at all (0)		
Not possible to include all interested farmers in a locality	13	15	23	24	92	5
Complex registration process	0	3	13	59	19	8
Difficult to replace a new member	2	9	16	48	40	6
Not all members manage to attend all the sessions	20	28	18	9	134	3
Meetings are not held regularly	0	3	15	57	21	7
Irregularity of extension services	0	0	11	64	11	9
Not all members get all technological training	16	20	24	15	112	4
No significant support in the market linkage	20	31	16	8	138	2
Not all members get equal benefits	26	32	10	7	152	1

The data presented in Table 4 reveal several critical challenges associated with the FFS approach, highlighting the disparities faced by its members. Firstly, the benefits of the program are not distributed evenly among participants, leaving some farmers at a disadvantage. Secondly, there is a notable lack of robust support for establishing market linkages, which hampers farmers' ability to sell their produce effectively. Thirdly,

participation is inconsistent, as not all members are able to attend every session, leading to gaps in knowledge and experience. Lastly, the technological training provided is insufficient, preventing some farmers from fully mastering essential agricultural practices. Farmer Field School is regarded as an extension strategy in which farmers receive season-long training on various elements of crop production, including soil and crop management in an economical and environmentally friendly manner (Ali and Wais, 2025). These four significant issues represent the primary barriers confronting farmers. Governmental bodies must acknowledge and address these obstacles, as they fundamentally undermine the effectiveness of the FFS approach and the overall advancement of farmers' knowledge and skills.

4. Conclusion and Recommendations

The study showed that about 61.3% of farmers possessed a medium level of knowledge, with 2.7% having low knowledge and 36% demonstrating high knowledge. The acceptance of the FFS approach among farmers is currently limited due to a lack of knowledge, which hinders their ability to innovate and apply new practices. Long-term engagement with the FFS is expected to increase acceptance as farmers improve their incomes. Key factors such as age, education level, family size, farming experience, farm size, income, organizational participation, and contact with extension media significantly influence farmers' knowledge acquisition through the FFS approach. Older farmers tend to rely on traditional methods, while younger, educated farmers are more open to adopting new techniques.

Several challenges hinder farmers' connection to the FFS, including a lack of market support, unequal benefit distribution among members, inconsistent attendance in sessions, and inadequate technological training. To address these issues, authorities need to implement training, motivational campaigns, and awareness programs. The study highlights the importance of considering age, education, and experience when developing policies to enhance farmers' knowledge gained through the FFS approach, emphasizing the need for significant support from the Department of Agricultural Extension (DAE) and NGOs.

Future research should use surveys to examine the long-term effects of Farmer Field School (FFS) participation on farmer knowledge retention, technology uptake, and income outcomes. More study is needed to determine the significance of digital extension tools and gender-inclusive initiatives in increasing equal engagement and knowledge dispersion. Comparative evaluations across agro-ecological and institutional settings are also proposed to assess the efficacy of FFS vs traditional extension tactics.

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