

Training Need of the Farmers on Farm Resource Management: A Case of North-Eastern Region in Rural Bangladesh

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Abstract: Capacity strengthening of the farmers is crucial for their resources management. In connection to this issue, this study was undertaken while the main purpose of the study was to determine the extent of training needs of the farmers on farm resource management. At the same time an attempt was also made to identifying the factors influencing the training needs on farm resources management along with different problems faced by them were also investigated. The study was conducted in four villages, namely Purba Gram, Nikli, Kamarhati and Nogor Gram under Nikli sub-district of Kishoreganj district in Bangladesh. Data were collected from a sample of 100 farmers through personal interview using a pre-tested structured questionnaire from 02 October to 23 October, 2018. Training needs of the farmers on farm resources management was the focus variable and twelve selected characteristics of the respondents constituted the explanatory variables. Appropriate scores and scales were used to measure the mentioned variables. Both descriptive and inferential analyses were used to analyze the collected data. The finding indicates that the majority (88 percent) of the respondents belonged to high training needs category while 12 percent of them belonged to medium training needs category and none of them belonged to low training needs category. Correlation analysis indicated that organizational participation, extension media contact, social mobility and knowledge on haor resources management had significant relationships with their training needs while others variables did not show any relationship. Level of education, annual family income, extension media contact, social mobility and knowledge on haor resources management were identified as influential factors as confirmed by the linear regression model. While this model also indicates that about 52% variations of the focus variable explained by the identified influential variables mentioned above. Besides, scarcity of storage facilities, poor knowledge on resources management, lack of cold storage, lack of training, poor credit facilities, lack of livelihoods capitals and so on were identified as the major problems as faced by farmers in managing the resources. Respective authority such as Department of Agricultural Extension (DAE), Department of Fisheries (DoF), Department of Livestock Services (DLS), NGOs etc. should emphasize the identified training needs and problems to take initiatives for improving the socioeconomic conditions of the farmers.

Keywords: training need; farmers, farm resource; rural Bangladesh

Introduction

Bangladesh is a low-lying riverine country and its topography, ecology and human habitat are greatly influenced by the two main river systems (Ganges and Brahmaputra river systems) originating from the Himalayas (Monwar et al., 2014). Changing courses of the river systems and frequent flooding throughout the monsoon have formed a large amount of diverse wetlands (4 million ha), such as rivers,

beels and haors (natural depressions) and flood lands that are largely affected by seasonal flood (Islam and Gnauck, 2008). Haor are large bowl-shaped depressions and seasonal wetlands prevailed by subtropical monsoon climate, which have distinctive hydro-ecological characteristics. The haor basins are mainly located in north eastern region of Bangladesh covering about 1.99 million hectares of area (Alam & Hossain 2009; CEGIS, 2012; Nowreen et al., 2014) and accommodating about 19.37 million people (CEGIS, 2012). There are about 373 haors located in the districts of Sunamganj, Habiganj, Netrakona, Kishoreganj, Sylhet, Maulvibazar and Brahmanbaria. Those haors cover an area of about 859,000 ha which is around 43% of the total area of the haor region. The population density of the haor basin is relatively low compared to the rest of the country, average 1000 population per village, household size stands at 6.5, birth rate 3.2 and 35% of the population is below the age of 10 years. The average annual rainfall in the areas is 4130 mm which is almost double compared to the country rainfall average (Salaudhin and Islam, 2011; Nowreen et al., 2014). Consequently haors receive surface runoff water from rivers and canals and become an extensive water body (covered by water almost 6 months) all over the monsoon (Sarma, 2010; Raju, 2013; Roy, 2015). However, during the post-monsoon, they mostly dry up. Usually the water body in haor area remains at the zero level from January to March and then starts to increase and again go down from August. Mostly, in June and July, the water level reaches the highest point. Almost all of the haor basins are inundated for 7–8 months to depths of 5 m or more during the monsoon (NERP, 1995).

The physical settings and hydrology of the haor area created countless opportunities and constraints for the inhabitants (Islam and Gnauck, 2008; CEGIS, 2012; Hanif et al., 2015). The wetlands are the habitat for over 289 indigenous fish species (13 orders, 61 families), 11 exotic fish species, 24 species of prawns (Hanif et al., 2015) and hundreds of thousands of migrating birds (Bird Life International, 2004). Therefore, the wetlands provide rich biodiversity which is an important income source and nutrition for millions of households in rural Bangladesh, particularly the poor (Salaudhin and Islam, 2011; Kazi et al., 2016).

Despite the economic importance of the haors, local people are seriously disadvantaged than any other parts of the country due to extreme poverty in terms of socioeconomic services (Parvin and Akteruzzaman, 2012; Rahman, 2014). Despite the economic progress of the country is increasing gradually at a moderate pace, the people of these regions face serious challenges due to the changes of environment and to the impacts of anthropogenic factors (Ahmed et al., 2008; CEGIS, 2012). More than 28% of farmers live below the lower poverty line. The haors often experience the most severe hydrological conditions such as extreme rainfalls and subsequent flash floods (Nowreen et al., 2014; Uddin et al., 2015). People's life and livelihood change cyclically round the year due to the land cover alteration (Rahman, 2014; Sarma, 2010). During monsoon, their livelihood depends on fishing, while during the winter boro rice cultivation becomes their occupation (Rahman, 2014). Transport accessibility of farmers has been always a challenge, especially during the monsoon, and they always face a limited access to many basic facilities (Chakraborty et al., 2005).

Land cover of the earth's surface is changing drastically due to the natural calamities and anthropogenic activities (Muttitanon and Tripathi, 2005; Sewnet, 2015). Haor area is mainly changed by natural forces other than human actions. Modifications of land cover of Haor basin also initiate due to various natural events such as weather, flooding, variations of climatic factors and ecosystem dynamics (Salaudhin and Islam, 2011).

The livelihood pattern of farmers is quite different and they are more disadvantaged than those of the

mainland or non farmers due to unique geographical settings (Rahman and Salam, 2008). Though the country has significant development over the past few years, the socio-economic development of farmers is almost same throughout the decade (Alom, 2016; Roy, 2015).

Overall, the haor region remains a part of Bangladesh where natural shocks, seasonal food insecurity and patterns of socio-economic and political exploitation create conditions of extreme and widespread vulnerability for a significant proportion of the population for long periods of the year. The region is also considered to be highly vulnerable to climate change impacts due to its unique physical setting and hydrology. Changing weather patterns in the region, including a rise in temperature and reduction in rainfall are recognized as having caused negative impacts on agricultural production in terms of both the annual rice harvest and winter vegetable crops, and fisheries, although there is as yet little empirical evidence of a consistent trend for increased flash flooding. Women and girls in the haor region are particularly vulnerable to context-specific negative impacts due to the implications of flooding and a fall for their access to healthcare and education, with early marriage being seen as a way of protecting girls from risks of sexual harassment during the flood season.

Livelihoods of the farmers are not quite good although they have household resources (handicraft, household properties, nutritious high value food, dry fish, tube well, sanitary latrine, sewing machine, homestead land etc.), farm resources (family farm land, hybrid /improved breed cow for milk, goat and sheep rearing/farm, duck rearing /farm, small scale cattle fattening farm, mechanized farm equipment etc.) and natural resources (land, water, forestry etc.). It is assumed that farmers of the haor area are not able to utilize their resources properly due to their poor knowledge and skill and others related issues. So, it is necessary to improve their skill to utilize their resources especially farm resources for the livelihoods improvement.

Besides, several research works have been conducted on flood hazards, and human and agricultural adjustment processes to flood in Bangladesh especially in Haor areas (Younus, 2012; Younus and Harvey, 2014). However, few studies conducted on flood coping ability issues in Haor and char areas (Khatun, 2009 and Munna 2009) while flood coping strategy for rural people also studied by Kamruzzaman 2010 and Rafique 2016. Hasan (2018) studied on effectiveness of flood coping strategies practiced by the fish farmers. On the other way, a good numbers of study conducted on training needs identification on different issues except farm resource management (Sharma and Riyazddin, 1995; Nikam and Rajmane, 1995, Rasel, 2004; Suman, 2015; Palleb, 2017; Bashar, 2017; Siddique, 2017). But, to date, no available studied found on training need identification on farm resources management. Thus, the researcher took a study of research entitled “Training Need of the Farmers on Farm Resource Management: A Case of North-Easter Region in Rural Bangladesh” to fulfill the following objectives:

- i. To determine the extent of training needs of the farmers on farm resource management.
- ii. To identify the factors influencing the training needs of the farmers on farm resource management.
- iii. To find out the problems faced by the farmers in managing farm resources.

Methodology

The study was conducted in specific areas of Nikli sub-district of Kishoreganj district. There were

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seven unions while Nikli and Dampara union were selected purposively which is intensively covered by adequate haor areas and natural resources. The respondents were selected from the villages of Purba Gram, Nikli, Kamarhati, and Nogor Gram.

The subjects of this study were households of the farmers within the two unions listed above. According to the information provided by the Upazila Agriculture Office, the numbers of farmers in the selected two Unions were around 1800 while 667 farmers belonged to landless, marginal and small farm size that were selected purposively for population of the study. Because this study was conducted under the support of project entitled "Capacity Strengthening of Resources Poor farmers in Resources Management for their Livelihood Improvement" funded by the Bangladesh Agricultural University (BAU) where landless, marginal and small farmers were recognized as resources poor farmers. Later on, 100 farmers were selected as sample of the study using simple random technique (15% of the population).

This study employed a mixed methods approach, collecting qualitative and quantitative data in two stages. The design of the study was based on an exploratory sequential mixed-methods design that aimed to collect qualitative data in the first stage to assist in building the second stage quantitative data collection instrument. The first stage employed interviews and focus groups to prepare the data collection instrument. The second stage employed a questionnaire survey that was conducted by the researchers to collect the final data from the farmers. Face to face interviews and two focus group discussions (FGDs) were conducted during the first stage to collect preliminary information about training related issues on farm resources from the farmer's group. The FGDs were facilitated by using a checklist of information on training needs on farm resources management that the researchers developed with the help of the experts. The second stage of data collection employed a questionnaire that was developed based on the information the researchers obtained from the FGDs and interviews conducted in the first stage. The questionnaire was piloted by 10 farmers. Then the necessary corrections and modifications were made accordingly. The questionnaire was deployed during the months of August to September, 2018. The questionnaire was comprised the sections that included demographics and relevant farm/farmer characteristics such the farmer's organizational participation, social mobility, extension media contact, social mobility, knowledge on haor resources management, training needs of the farmers on farm resources management and Problem faced by the farmers on resources management. The personal interview was conducted from 02 October to 23 October, 2018.

A four-point rating scale was used to determine the extent of training needs of the farmers on farm resources management. Twenty three training aspects namely management of homestead gardening, environment friendly farming practices, vegetable gardening, insect-pest management, preparation of organic manure (FYM, Composting, vermin-compost etc.), quality seed production, processing and preservation, fish processing, management of intercultural operations (weeding, mulching, thinning etc.), floating agriculture, cage culture, management of fish disease, management of poultry farming, management of dairy farming, disease management of livestock, quality feed and fodder, beef fattening, duck rearing, farm mechanization, nutrient management in soil, marketing of farm products, vaccination, artificial insemination, management of fishing instruments(boat, net etc.). The farmers were asked to rate the training needs on farm resources management using high, medium, low, or none with a corresponding score of 3, 2, 1, and 0, respectively. Hence, the scale score ranged from 0 to 69, where 0 indicated no training need and 69 indicated a high training need. The ranking of the statements was carried out to prioritize the statements where the training needs on farm resources management are high. A weighted average index (WAI) (Ndamani and Watanabe, 2016) for an

individual training need was computed to find out the important strategies in the study area (Equation (1)).

$$WAI = F_h \times 3 + F_m \times 2 + F_l \times 1 + F_n \times 0(1)$$

Where, WAI = weighted average index, F_h = frequency of responses with high training need, F_m = frequency of responses with medium training need, F_l = frequency of responses with low training need, F_n = frequency of responses with no training need, and N = total number of responses.

The Problem faced by the hoar people on resources management were identified by using closed form question. The farmers were asked to give their opinion on selected 13 problems. The responses obtained from the farmers were scaled as high, medium, low and not at all, with a corresponding score of 3, 2, 1, and 0, respectively. The score ranged from 0 to 39, where 0 indicated no problem and 39 indicated high problem. A total problem score (TPS) for individual faced on farm resources management (Equation (2)).

$$TPS = P_h \times 3 + P_m \times 2 + P_l \times 1 + P_n \times 0(2)$$

Where, TPS = Total problem score, P_h = Number of farmers indicating high problem, P_m = Number of farmers indicating medium problem, P_l = Number of farmers indicating low problem, P_n = Number of farmers indicating no problem at all

Results and Discussion

Training Needs of the Farmers on Farm Resources Management

Training needs of the farmers on farm resource management was the main focus of the research work. Twenty three types of training needs were selected to measure the extent of training needs of the respondents on farm resource management. The total score of training needs could range from 0 to 69. Based on their training needs scores the farmers were classified into three categories as shown in Table 1. The observed training needs scores ranged from 38 to 62.

Table 1. Categorization of respondents according to their overall training needs on farm resources management

Categories	Respondents		Mean	SD*
	Number	Percentage		
Low training need (up to 23)	0	0	53.13	5.382
Medium training need (24-46)	12	12		
High training need (above 46)	88	88		
Total	100	100		

*SD = Standard Deviation

Data presented that the highest proportion (88 percent) of the respondents belonged to high training needs category and 12 percent of them belonged to medium training needs category. But none of respondents had belonged to low training needs category. It indicates that most of the farmers in the study area having poor skills which might affect their livelihoods outcomes. Therefore, intervention needs to be taken the concerned authority considering the above mentioned situation.

Extent of training needs of the farmers on farm resources management

There were 23 aspects that considered while measuring the extent of training needs of the respondents on farm resources management. The computed total score of the entire dimension have been shown in Table 2. Observed range of total score was 141-294 while possible score was 0-300. It can be mentioned that much difference was observed between the total score of aspects of training needs opined by the respondents. The respondents did not feel similar extent of training needs for all these twenty three aspects regarding farm resources management.

Table 2. Extent of training needs on farm resources management (n = 100)

Aspects of Training Need	Extent of training needs				Total score	Rank order
	H(3)	M(2)	L(1)	N(0)		
Quality Seed production , processing and preservation	94	6	0	0	294	1
Cage culture	92	5	3	0	289	2
Floating agriculture	91	6	3	0	288	3
Environment friendly farming practices	80	20	0	0	280	4
Preparation of organic manure (FYM, Composting, vermin-compost etc.)	75	25	0	0	275	5
Duck raring	69	29	2	0	267	6
Management of dairy farming	66	34	0	0	266	7
Management of poultry farming	59	40	1	0	258	8
Management of homestead gardening	57	43	0	0	257	9
Quality feed and fodder	63	27	10	0	253	10
Management of fish disease	53	37	10	0	243	11
Disease management of livestock	45	53	2	0	243	12
Vegetable gardening	23	74	3	0	220	13
Management of intercultural operations (weeding, mulching, thinning etc.)	8	91	11	0	217	14
Insect-pest management	20	70	10	0	210	15
Management of fishing instruments (boat, net etc.)	14	77	9	0	205	16
Beef fattening	14	75	10	1	202	17
Fish processing	13	76	11	0	202	18
Farm Mechanization	11	74	15	0	196	19
Vaccination	18	57	23	2	191	20
Artificial insemination	27	19	52	2	171	21
Nutrient management in soil	18	27	50	5	158	22
Marketing of farm products	7	39	42	12	141	23

Notes: H = High (score: 3), M = Medium (score: 2), L = Low (score 1), N = Not at all (score: 0),

Out of twenty three aspects, on the basis of computed total score, eighteen aspects belongs to high training need, these are: quality seed production processing and preservation, cage culture, floating agriculture, environment friendly farming practices, preparation of organic manure (FYM, composting, vermin-compost etc.), duck raring, management of dairy farming, management of poultry

farming, management of homestead gardening, quality feed and fodder, management of fish disease, disease management of livestock, vegetable gardening, management of intercultural operations (weeding, mulching, thinning etc.), insect-pest management, management of fishing instruments (boat, net etc.), beef fattening and fish processing. On the other hand, another five aspects that belongs to medium training needs and these are: farm mechanization, vaccination, artificial insemination, nutrient management in soil and marketing of farm products. But, none of aspects of training needs belonged to low category. Due to lack of knowledge on resources management, lack of education, low social mobility and poor communication exposure may lead to fell need for training on farm resources management. Based on the identified training needs, policy makers in the same line should take initiative to improve the farmers' skills. Quality seed is one of the inputs for crop production while cage culture is crucial especially in the flooded area. Therefore, both these area should gets priority while taking action in the same area for socioeconomic development of the poor farmers.

Factors influencing the training needs of the farmers

Coefficient of correlation analysis

The coefficient of correlation (r) was computed in order to explore the relationships between the selected characteristics of the farmers with their training needs on farm resource management and results placed into the Table 3. Correlation analysis indicates that the organizational participation, extension media contact, social mobility, farmers knowledge on haor resource management were significantly correlated with their training needs on farm resource management. However age, level of education, family size, farm size, farming experience, annual family income, duration of training and amount of credit had no relationship with their training needs on farm resource management.

Table 3. Relationship between the selected characteristics of the farmers and their training needs on farm resources management

Selected characteristics	Correlation co-efficient (r) value with 98 df	Tabulated values (r) Significant at (98 df)	
		0.05	0.01
Age	-0.155	0.197	0.257
Level of education	-0.014		
Family size	0.038		
Farm size	0.084		
Farming experience	-0.085		
Annual family income	-0.135		
Duration of training	0.055		
Amount of credit	0.089		
Organizational participation	0.208*		
Extension media contact	0.395**		
Social mobility	0.593**		
Knowledge on Haor resources management	0.441**		

** Significant at 0.01 level of probability

* Significant at 0.05 level of probability

Econometric Estimation of Factors Influencing the Training Needs of the Farmers on Farm Resources Management

To determine the factors associated with extent of training needs of the farmers on farm resources management, multiple regression analysis (enter method) was conducted and results are placed in the Table 4.

The value of R and adjusted R² values found in the multiple regressions was .718 and .516, the corresponding F value 7.722**and also significant at 0.001 level. The findings of linear regression analysis indicated that the determinant factors influencing the training need were level of education, annual family income, extension media contact, social mobility and knowledge on haor resources management. This model also explains that about 52 percent variation of the dependent variable explained by the identified factors mentioned above. It can also be said that about 48 percent variation of the dependent variable explained by the unknown factors. Thus, it can be predicted that there was an error while selecting the independent variables (may be very influential factors missing) or errors occurred during data collections or others reasons for the same.

Table 4.Summary of the linear multiple regression analysis (n=100)

Explanatory variables	Unstandardized Co-efficient		Standardized Co-efficient	t	Sig. B
	B	Std .Error	B		
(Constant)	41.936	3.645		11.504	.000
Age	-.148	.084	-.339	-1.754	.083
Level of education	-.423	.178	-.258	-2.382	.019
Family size	.379	.233	.169	1.625	.108
Farm size	-.916	4.735	-.016	-.194	.847
Farming experience	.110	.092	.226	1.189	.238
Annual family income	-.030	.015	-.202	-1.985	.050
Duration of training	.077	.110	.054	.695	.489
Amount of credit	.037	.034	.084	1.075	.286
Organizational participation	-.463	.658	-.081	-.704	.483
Extension media contact	.417	.154	.256	2.710	.008
Social mobility	.698	.199	.369	3.501	.001
Knowledge on haor resources management	.748	.261	.301	2.862	.005
R=.718 R ² = .516 Adjusted R ² =.449 F-Value=7.722**					

The findings of the multiple linear regression analysis indicated that level of education was significant at 5 percent level of significant and showed negative trend, it implies that the training needs on farm resources management increases with the decreases of level of education of the respondents. On the other way, it is also indicates that if one unit of level of education increases then the probability of training needs decrease is 0.423. The findings of the multiple linear regression analysis indicated that annual family income was significant at 5 percent level of significant and showed negative trend, it implies that the training needs on farm resources management increases with the decreases of annual family income of the respondents because poor economic condition lead to the individuals willing to do for their livelihoods improvement. Here it is also interpret that if one unit

income of the farmers increases that the probability of training needs on farm resources management decrease is 0.030.

The findings of the multiple linear regression analysis indicated that extension media contact was significant at 1 percent level of significant and showed positive trend, it implies that the training needs on farm resources management increases with the increase of extension media contact of the respondents. With the increase of the extension media contact farmers are more aware and knowledgeable, that can affect significantly on their training needs on farm resources management. Besides, if one unit extension media contact of the farmers increases that the probability of training needs on farm resources management also increase is 0.417.

The findings of the multiple linear regression analysis indicated that social mobility was significant at 1 percent level of significant and showed positive trend, it implies that the training needs on farm resources management increases with the increase of social mobility of the respondents. Mobility of the farmers may influence about the orientation of the innovation and this lead to adopt new practice along with related training for their skill development. It can be interpreted that if one unit social mobility of the farmers increases that the probability of training needs on farm resources management also increase is 0.698.

The findings of the multiple linear regression analysis indicated that farmer's knowledge on haor resources management was significant at 1 percent level of significant and showed positive trend; it implies that the training needs on farm resources management increases with the increase of knowledge on haor resources management of the respondents. With increasing knowledge of individuals understanding on different issues will be increased. On the other hand, it can be said that if one unit knowledge of the farmers increases that the probability of training needs on farm resources management also increase is 0.748.

Problem faced by the Farmers on Farm Resources Management

As many as thirteen problems in connection with resources management were included in problems confrontation scale. The total score of problems faced by the farmers on farm resources management range from 0 to 39. Based on their problem scores the respondents were classified into three categories as shown in Table 5.

Table 5. Distribution of respondents according to their overall problem (n = 100)

Categories	Respondents		Mean	SD*
	Number	Percentage		
Low problem (up to 13)	0	0	24.77	2.326
Medium problem (14-26)	75	75		
High problem (above 26)	25	25		
Total	100	100		

*SD = Standard Deviation

Data show that 25 percent of the respondents had faced high problem and 75 percent of them had faced medium problem on resources management.

Table 6. Problem faced by the farmers on resources management (n = 100)

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Serial No.	Problems	Extent of problem				Total score	Rank order
		H(3)	M(2)	L(1)	N(0)		
1	Scarcity of storage facilities	86	13	1	0	285	1
2	Poor knowledge on resources management	84	16	0	0	284	2
3	Lack of cold storage	83	14	1	2	278	3
4	Lack of training	79	20	1	0	278	4
5	Poor credit facilities	25	74	1	0	224	5
6	Lack of livelihoods capitals	20	80	0	0	220	6
7	Poor access to haor	6	90	4	0	202	7
8	Sudden flood	6	63	31	0	175	8
9	Lack of farm machineries	8	43	48	1	158	9
10	Lack of good governance	3	40	55	2	144	10
11	Pest and disease outbreaks	0	34	64	2	132	11
12	Labour crisis	2	16	16	66	54	12
13	Poor transports/vehicles facilities	1	12	11	76	38	13

Notes: H = High (score: 3), M = Medium (score: 2), L = Low (score 1), N = Not at all (score: 0)

From the rank order it was found that Scarcity of storage facilities occupied first position and seems to be most severe problem on farm resources management in that area. On the other hand most of the respondents are faced with poor knowledge on resources management and lack of cold storage which were ranked second and third position. There were also different problems associated with farm resources management, such as lack of training, poor credit facilities, lack of livelihoods capitals, poor access to haor, sudden flood, lack of farm machineries, lack of good governance, pest and disease outbreaks, labour crisis and poor transports/vehicles facilities . During discussion with the respondents they opened that the management practice of farm resources could be increased if the extension activities in the study area increased along with the improvement of training facilities on farm resources management.

Conclusions

Most of the farmers of the study area having poor skills to utilize their resources properly resulted in seeking training for improving their skills. In addition, it can also be concluded that 23 identified aspects on which they need to improve their skill and thus, respective authority like Department of Fisheries (DoF), Bangladesh gets opportunity to arrange training programmes for the farmers. Level of education, annual family income, extension media contact, social mobility and knowledge on haor resources management were identified as determinants of training needs of farmers as confirmed by the regression model. Therefore, it can be concluded that these five factors are expected to important factors that influencing the training needs of farmers on farm resources management. The major problems faced by the farmers were scarcity of storage facilities that got first ranked while poor knowledge on resources management and lack of cold storage which got the second and third ranked respectively. In addition, problems associated with farm resources management according to rank order are lack of training, poor credit facilities and so on. Therefore, it can be concluded that these mentioned problems may be the main reasons having high level of training needs of the farmers. Policy makers may be taken interventions to minimize of these identified problems for improving the socioeconomic conditions of the farmers.

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