A STUDY ON THE EFFECTIVENESS OF UTILIZATION OF THE UNION DIGITAL CENTER AGRICULTURAL INFORMATION BY THE FARMERS IN BANGLADESH

ABSTRACT

Aims: The aims of the study were to determine the effectiveness of Union Digital Center (UDC) in the utilization of agricultural information by the farmers, also to investigate the contribution of the selected characteristics of the farmers to the effectiveness of UDC in the utilization of agricultural information and to resolve the problems faced by the farmers in receiving agricultural information from the UDC.

Study Design: It is a Field Survey Research. Firstly, different research themes are collected and analyzed followed by research problem formulation. Reviews were studied to select appropriate variables and the surveying tool (interview schedule) preparation. After that, pre-testing of the interview schedule was done before the final data collection. Finally, data were collected, analyzed and the report was prepared. An explanatory and cross-sectional research design was used in this research.

Place and Duration of Study: The study was conducted in a union named Alokjhari under Khanshama Upazila of Dinajpur district of Bangladesh. Most of the farmers of this area are directly and/or indirectly engaged in agricultural activities and few people are service holders and businessmen. There are eight villages in this union. The study was conducted in these eight villages from January 2020 to February 2022.

Methodology: The farmers of Alokjhari Union who were members of the Common Interest Group (CIG) under the National Agricultural Technology Project (NATP) of the Department of Agricultural Extension (DAE) constitute the population of the study. There were 10 CIGs in this union and each CIG consist of 20 members. Thus, the population was 200. According to Yamane's (1967) formula, the sample size was determined as 154 from 200 population. A simple random sampling method was used in order to select the sample. Data were collected using a structured interview schedule. Descriptive statistics and stepwise multiple regression were used for analysis. The effectiveness of UDC was determined on 10 selected agricultural information based on three dimensions viz. information receive, information understanding and information application.

Results: The highest proportion 49.4 percent of the farmers had low effectiveness of UDC in utilizing agricultural information compared to 30.5 percent with medium effectiveness and 20.1 percent with high effectiveness. And the highest effective information that the farmers asked for was found on 'compost preparation' followed by 'tree plantation', 'recommended seed rate', 'recommended varieties' and so on. Among the selected agricultural information, the lowest effective information was 'fruits processing techniques.' Among the influential variables level of education, family income, innovativeness, agricultural knowledge and aspiration provided a 53.1 percent contribution to the effectiveness of UDC. Among the ten selected constraints faced by

the farmers ‘employee shortage in Union Digital Center’ ranked first and lowest was ‘Negative attitude and obstacles from local leaders.’

Conclusion: The findings indicate that UDC plays a moderate role in the utilization of agricultural information. Where Agricultural knowledge was the main contributor to the improvement of the effectiveness of UDC while agricultural knowledge should be increased to both farmers and UDC staff levels. The study findings recommend that DAE and the Ministry of Agriculture should take necessary steps for the improvement of farmers’ agricultural knowledge offering need-based training and strengthening farmers through FFSs, IPM clubs, etc. and besides these eligible agriculturists should be appointed.

Keywords: Effectiveness, Union Digital Center, agricultural information, interview schedule, stepwise multiple regression

1. INTRODUCTION

1.1Background of the study

Bangladesh is one of the leading developing countries in the World. About 61.05 percent of her population lives in rural areas, approximately 169.4 million people [1]. About three-fourths of the total population lives in rural areas and virtually all of them make their living exclusively or substantially from agriculture. Agriculture is one of the largest sectors of the economy in Bangladesh. The contribution of agriculture to the Gross Domestic Product (GDP) in the economy of Bangladesh is 11.50 percent [2]. Bangladesh is an overpopulated country and blessed with fertile land. But due to poverty and limited application of modern technology and inputs, its per hectare yield of crops is still very low. There is a big gap between the actual and potential yield of many crops; therefore, there is ample scope to increase the yield of many crops [3].

Due to increased population pressure in Bangladesh, till now the main thrust of the government is being consistently given on food production [4]. In order to increase production substantially, each and every farmer has to be given attention and proper guidance along with appropriate information. Government extension service is not efficient at the appropriate level due to a lack of manpower and sufficient fund. The government should take immediate measures to strengthen the extension system to ensure food security. Private sector initiatives with funding from national and international donor agencies and in association with the government extension system have become very much essential. Not only knowledge is needed, but an approach will also be needed to supply the right knowledge and tools to the right people at the right time and place.

The Union Digital Centre (UDC) in Bangladesh is an information technology-based telecentre that launched in 2009 with only 30 Union Parishads (UPs) through the Access to Information program under the Prime Minister’s Office (PMO) and Local Government Division partnership, now operating 4562 Union Parishads of Bangladesh [5]. The Union Digital Centers (UDCs) were established to facilitate and provide services on agricultural information as well as computer facilitation and training, internet browsing, email support, video conferencing,

photography and other related technical information [6]. According to the UDC Census 2023, approximately 555 million people receive information and services directly from UDCs [7]. The basic aims of the establishment of these centers are to provide facilitation and services in a cheap cost and to develop an information database for assurance of easy access to information at the union level. Through the use of ICT, UDC is able to bring various types of information related to government, livelihood and private services to the doorstep of citizens in rural areas. Operating under the Public-Private-Peoples' Partnership (PPPP) modality, these centers are run by local entrepreneurs, hosted by union parishads and supported by central administration. The entrepreneurs of the UDCs provide information to the village people for make consciousness about featured content on agriculture, health, education, law and right of people, industry, business, employment, etc. The UDCs are situated within the union council complex so that the rural people can take advantage of the facilitation and services easily. Research is not available on whether the aims and objectives have been fulfilled or to what extent the objectives of UDC have been achieved. Keeping this in mind the present study was conducted to determine the effectiveness of the union digital center in the utilization of agricultural information by the farmers. The study aimed to find out the answer to the following questions: i)To what extent of effectiveness, are the farmers receiving agricultural information from the UDC? ii) What are the relationships among the farmer's selected characteristics with the effectiveness of UDC in the utilization of agricultural information as perceived by the farmers? iii) What is the contribution of the farmer's selected characteristics to the effectiveness of UDC in the utilization of agricultural information as perceived by the farmers? iv) What are the constraints faced by the farmers in receiving agricultural information from UDC?

1.2. Objectives of the Study

In view of the problems, stated above, the following objectives are put forward for giving proper direction to the study:

1. To determine the effectiveness of the union digital center in receiving agricultural information by the farmers
2. To determine and describe the selected characteristics of the farmers.
3. To determine the contribution of the selected characteristics of the farmers to the effectiveness of UDC in the utilization of agricultural information as perceived
4. To know the problems faced by the farmers in receiving agricultural information from the UDC

2. MATERIALS AND METHODS:

2.1 Locale of the Study

The study was conducted in a union named Alokjhari under Khanshama Upazila of Dinajpur district which was purposively selected. Most of the farmers of this area are directly and/or indirectly engaged in agricultural activities and few people are service holders and businessmen. There are eight villages in this union. The study was conducted in these eight villages as stated in figure 1 below.

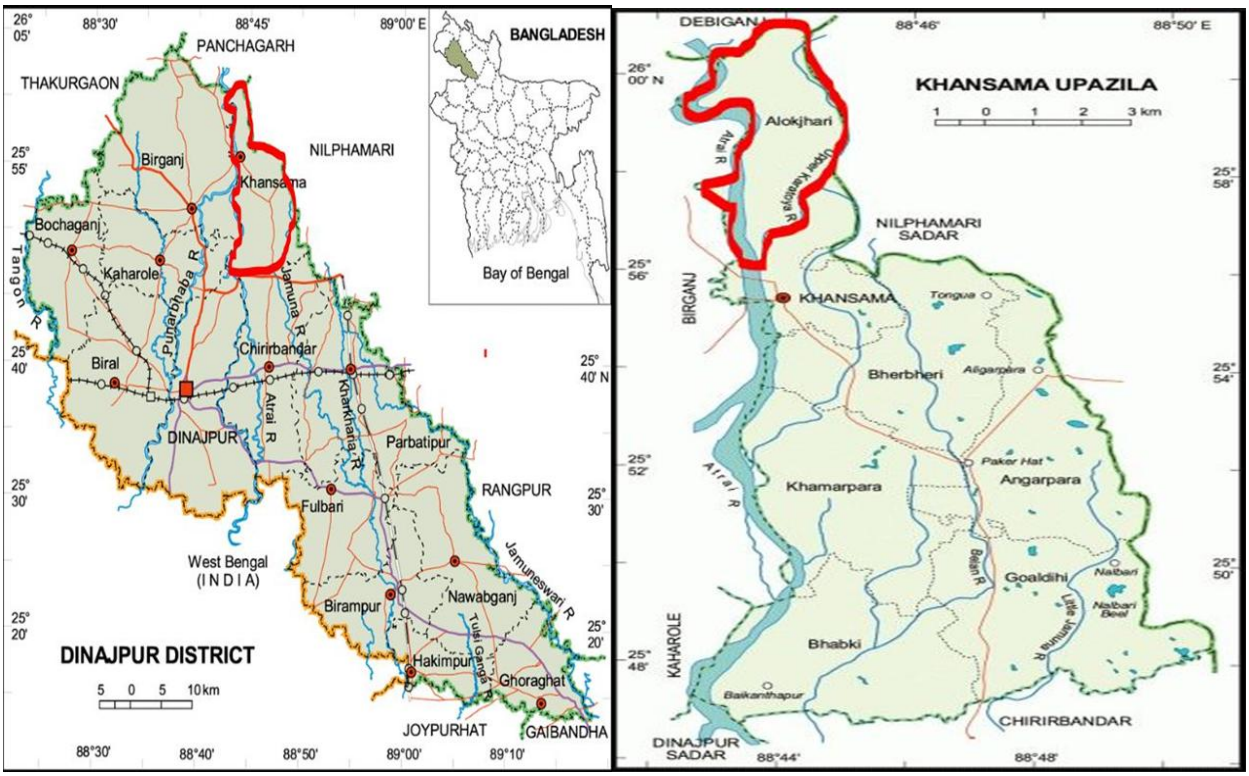

Figure 1: The above map showing the study area

Source: www.google.com

2.2 Population and Sampling Procedure

The farmers of the Alokjhari Union who were members of the Common Interest Group (CIG) under the National Agricultural Technology Project (NATP) of the Department of Agricultural Extension (DAE) constitute the population of the study. There were 10 CIGs in this union and each CIG consist of 20 members. Thus, the population was 200. The sample size was determined as 154 using Yamane's formula [8]. In calculating sample size from the following formula, a 5% precision level, 50% degree of variability and value of Z = 2.57 at 99% confidence levels were chosen. Then 154 farmers were selected with the help of a calculator from the population.

The formula is shown below -

$$n = \frac{Z^2 P(1-P)N}{Z^2 P(1-P) + Ne^2}$$

Where,
n = sample size
N = population size
e = the level of precision
z = the value of the standard normal variable given the chosen confidence level
p = the proportion or degree of variability

A simple random sampling method was used in order to select the sample. A reserve list of 23 farmers which is about 15 percent of the sample size was prepared so that these farmers could be used for interview in case of unavailability of any farmer.

2.3 Research Instrument

An interview schedule was prepared mostly with close-form questions. Simple questions and statements were included in the schedule to obtain information regarding the research topic. Open-ended questions were also used to give respondents the opportunity to give their opinion and suggestions regarding receiving agricultural information from UDC. Scales were developed for suitable scores in the effectiveness of the Union Information and Service Center. The interview schedule was pre-tested in an actual field situation before using the same for the final collection of data among 15 respondents in the study area. Necessary corrections, additions and alternations were made in the interview schedule on the basis of the results of the pre-test. The modified and corrected interview schedule was then printed in final form for data collection.

2.4 Data Collection

A face-to-face interviewing method was used for data collection. Data were collected from the selected 154 farmers, using an interview schedule. Necessary coordination was obtained from the Sub-Assistant Agriculture Officers (SAAOs) and the Common Interest Group (CIG) members. During the visit, the aims and objectives of the study were explained to most of the respondents. This helped the researcher to have a friendly orientation to the group members. Before going to the respondents for an interview, advanced information was taken with the help of Sub-Assistant Agriculture Officers (SAAOs). Data were collected from 13 January to 15 February 2021.

2.5 Measurement Techniques of the Independent Variable

Table 1 Showing the Measurement Techniques of the Independent Variable

Sl. No	Characteristics	Score Technique
1.	Age	1 for each complete year of age of the respondent
2.	Level of education	1 for each year of school education,0 for illiterate and 0.5 for can sign only
3.	Family size	1 for each member of the family
4.	Farm size	1 for each hectare of land
5.	Family income	1 for each (‘000’ Taka) income in a year
6.	Innovativeness	0 for no adoption at all, 1 for adoption above 5 years of hearing, 2 for adoption between 4-5 years of hearing, 3 for adoption between 2-3 years of hearing and 4 for adoption within 1 year of hearing
7.	Extension media contact	0 for no contact, 1 for rare contact, 2 for occasional contact and 3 for regular contact

8.	Agricultural Knowledge	2 for the full answer to a question, 1 for the partial answer to a question and 0 for the wrong/no answer to a question
9.	Marketing Awareness	5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and 1 for strongly disagree
10.	Aspiration	5 for strongly agree, 4 for agree, 3 for undecided, 2 for disagree and 1 for strongly disagree
11.	Constraints faced by the farmer	0 for no problem, 1 for low problem, 2 for moderate problem and 3 for severe problem

2.6 Measurement Techniques of the Dependent Variable

Effectiveness of Union Digital Center (EUDC):

To measure the Effectiveness of Union Digital Center (EUDC), the scores of selected three dimensions such as information received, understanding of the received information and application of the received information were added. The first dimension included the involvement of the farmers in receiving information, the second one ensured understanding of the received information and the third dimension covers the information application on their farming activities. Each of the dimensions was measured separately with 5- point rating scale against the selected agricultural information.

2.6.1 Information received from UDC

Information received from the UDC was calculated by computing information received from sub-scores (IRS) for each of the farmers. The weights assigned to the scale were 0 for ‘none’, 1 for ‘low’, 2 for ‘moderate’, 3 for ‘high’ and 4 for ‘very high’. The IRS of a farmer was obtained by adding the score obtained by selected agricultural activities. Thus, the IRS of a respondent was from 0 to 40, where 0 indicated non-receive and 40 indicated very high receive of agricultural information from UDC.

2.6.2 Understanding of the received information

It was assumed that the understanding of information may be less than the information received. The understanding of the received information by the farmers was calculated by computing information understanding sub-scores (IUS) for each of the farmers. The weights assigned to the scale were 0 for ‘none’, 1 for ‘low’, 2 for ‘moderate’, 3 for ‘high’ and 4 for ‘very high’. The IUS of a farmer was obtained by adding the score obtained by selected agricultural activities. Thus, the IUS of a respondent could range from 0 to 40, where 0 indicated no understanding and 40 indicated a very high understanding of the received information from UDC.

2.6.3 Application of received information

The third dimension of the dependent variable means after understanding of agricultural information how much information they applied in their farm. It was assumed that the application of information may be less than the understanding of information. The application of information

by the farmers was calculated by computing information application sub-scores (IAS) for each of farmer. The weights assigned to the scale were 0 for 'none', 1 for 'low', 2 for 'moderate', 3 for 'high' and 4 for 'very high'. The IAS of a farmer was obtained by adding the score obtained by selected agricultural activities. Thus, the IAS of a respondent could range from 0 to 40, where 0 indicated no application and 40 indicated very high application of the received agricultural information from UDC.

2.6.4 Development of Indices

For making a comparative analysis of the 10 selected agricultural information with respect to receiving, understanding and application an overall Effectiveness of the Union Digital Center Index (EUDCI) was calculated.

EUDCI was calculated by adopting the following formula [9]:

$$\text{EUDCI} = \frac{P_n \times 0 + P_l \times 1 + P_m \times 2 + P_h \times 3 + P_{vh} \times 4}{4}$$

Where,
Pn = Percentage of farmers for none effectiveness
Pl = Percentage of farmers for low effectiveness
Pm = Percentage of farmers for moderate effectiveness
Ph = Percentage of farmers for high effectiveness
Pvh = Percentage of farmers for very high effectiveness

For making a comparative analysis of the 10 agricultural information in respect of receiving information, understanding, and application, a comparative index was calculated. Thus, the value of receive index (RI) for each of the 10 agricultural activities could range from 0 to 100, where 0 indicated no-receive and 100 indicated very high receive of the agricultural information. A similar procedure was followed to calculate the understanding index (UI) and application index (AI). The EUDC for the selected agricultural information was the summation of RI, UI, and AI values. Thus, the possible value of EUDCI could range from 0 to 300, where 0 indicated no effect and 300 indicated very high effectiveness of UDC in the utilization of agricultural information as perceived by the farmers.

3. Results and Discussions:

3.1 Selected Characteristics of the Farmers

A variety of attributes that aggregate in human life influenced their activity directly and indirectly. For this reason, it can be assumed that different characteristics of farmers may influence the effectiveness of Union Digital Center in receiving their agricultural information and hence 10 selected characteristics (i.e. age, level of education, family size, farm size, family income, innovativeness, extension media contact, agricultural knowledge, marketing awareness, aspiration and constraints faced by the farmers) were considered as independent variables in this regard. The characteristics of the farmers were classified into suitable categories for description and interpretation in relation to the effectiveness of UDC Table 2.

Table 2 Characteristics Profile of the Farmers

SL. NO.	Characteristics	Measuring Unit	Range		Mean	Standard Deviation
			Possible	Observed		
01	Age	No. of year	Unknown	24-66	41.55	9.59
02	Level of education	Year of schooling	Unknown	0-14	7.17	3.83
03	Family size	No. of members	Unknown	2-12	5.75	1.93
04	Farm size	Hectare	Unknown	0.06-6.43	1.08	1.01
05	Family income	('000' Tk.)	Unknown	88-999	421.98	210.39
06	Innovativeness	Score	0-40	14-38	27.71	5.13
07	Extension media contact	Score	0-60	3-47	27.38	7.98
08	Agricultural Knowledge	Score	0-40	13-36	26.09	4.56
09	Marketing Awareness	Score	10-50	20-48	34.97	8.46
10	Aspiration	Score	10-50	20-48	35.61	8.25
11	Constraints faced by the farmer	Score	0-30	4-23	11.22	4.96

Source: Research Findings (2023)

3.2. Effectiveness of union digital center

The effectiveness of UDC was determined by computing the Effectiveness of Union Digital Center Index (EUDCI). EUDCI was computed by the summation of receive index (RI), understanding index (UI) and application index (AI). The EUDCI value of each of the selected agricultural information ranged from 84.98 to 166.94 against the possible range 0 to 300 (Table 3).

Table 3 Distribution of index value for calculation of the effectiveness of Union Digital Center with rank order

Sl. No.	Agricultural information	Dimensions index value			EUDCI	Rank order
		RI	UI	AI		
1.	Recommended varieties	70.48	49.73	35.03	155.24	4
2.	Recommended seed rate	70.93	47.38	38.60	156.91	3
3.	Recommended irrigation	68.70	46.23	33.10	148.03	7
4.	Recommended doses of fertilizer	68.55	45.75	37.15	151.45	6
5.	Integrated pest management (IPM) practices	70.15	46.88	36.65	153.68	5
6.	Modern cultivation technology	54.85	32.40	23.55	110.8	8
7.	Compost preparation	73.73	52.33	40.88	166.94	1
8.	Post-harvest management of vegetables	53.73	34.40	20.65	108.78	9
9.	Fruits processing techniques	41.35	24.83	18.80	84.98	10
10.	Tree plantation	72.75	50.68	37.83	161.26	2

Source: Research Findings (2023)

The findings contained in Table 4 indicate that the highest effective information was 'compost preparation' (EUDCI=166.94) followed by 'tree plantation' (EUDCI=161.26), 'recommended seed rate' (EUDCI=156.91), 'recommended varieties' (EUDCI=155.24) and so on. Among the selected agricultural information, the lowest effective information was 'fruits processing techniques' (EUDCI=84.98).

Compost preparation was found as the most effectively utilized information from UDC. The result might be that Bangladesh is predominantly an agricultural country and compost fertilizer is environment friendly, increase soil fertility and can be prepared easily in residence. Hence, peoples were very much interested in the information related to compost preparation.

The second most effectively utilized information was tree plantation. The result may due to that the land topography of the research area is about high. Therefore, it is easy to practice tree plantation ultimately farmers become aware of the information about tree plantation.

The lowest effectively utilized information was fruit processing techniques. The result might be that farmers are less aware of this information and less applied in their farms.

The findings and above-mentioned discussions promoted the researcher to conclude that the information which is easily available, close to farmers and widely practiced in agriculture have received from UDC by the farmers.

3.3 Overall Effectiveness of union digital center based on actual scores

The overall effectiveness of UDC was determined on the basis of their actual scores. Thus, the observed effectiveness scores of the farmers ranged from 16 to 99 against the possible score of 0 to 120. The mean and standard deviation were 55.92 and 16.13 respectively. The respondents were classified into three categories namely 'low effectiveness' (up to 40), 'medium effectiveness' (41 to 72) and 'high effectiveness' (above 72) on the basis of their effectiveness scores (Table 4).

Table 4 Distribution of the farmers according to their effectiveness

Categories (Mean ± 1SD)	**Number**	**Percent**	**Mean**	**SD**
Low (≤40)	76	49.4	55.92	16.13
Medium (41-72)	47	30.5		
High (>72)	31	20.1		

Source: Research Findings (2023)

The highest proportion (49.4 percent) of the farmers had low effectiveness of UDC in receiving agricultural information compared to 30.5 percent had medium effectiveness and 20.1 percent had high effectiveness. The findings revealed that above three a fourth (79.8 percent) of the farmers had medium to low effectiveness of UDC in the utilization of agricultural information. Therefore, it can be said that the UDC plays a moderately significant role in the utilization of agricultural information by farmers.

3.4 Contribution of the selected characteristics of the farmers to the effectiveness of UDC in the utilization of agricultural information

For this study, eleven characteristics of the respondent were selected and each of the characteristics was treated as independent variables. The selected characteristics were age (X_1), level of education (X_2), family size (X_3), farm size (X_4), family income (X_5), innovativeness (X_6), extension media contact (X_7), agricultural knowledge (X_8), marketing awareness (X_9), aspiration (X_{10}) and constraints faced by the farmers (X_{11}). The effectiveness of Union Digital Center (UDC) in the utilization of agricultural information (Y) was the only dependent variable of this study.

The full model regression analysis was run with selected 11 independent variables. But it was observed that the full model regression results were misleading due to the existence of interrelationships among the independent variables. Therefore, to avoid misleading results and determine the best explanatory variables, the method of step-wise multiple regressions was administrated and 11 independent variables were fitted together in step-wise multiple regression analysis. Table 5 shows the summarized results of step-wise multiple regression analysis with 11 independent variables on the effectiveness of Union Digital Center (UDC) in the utilization of agricultural information. It was observed that out of 11 variables 5 independent variables namely the level of education (X_2), family income (X_5), innovativeness (X_6), agricultural knowledge (X_8) and aspiration (X_{10}) were entered into the regression equation. The other six variables were not entered into the regression equation. The regression equation so obtained is presented below:

$$Y= -24.61 + 0.435\times X_8 + 0.205\times X_6 + 0.141\times X_2 + 0.193\times X_{10} + 0.149\times X_5$$

Table 5 Summary of stepwise multiple regression analysis showing the contribution of selected characteristics of the respondents to the effectiveness of Union Digital Center (UDC) in the utilization of agricultural information

Variables Entered	Standardized Partial 'b' Coefficients	Value of 't' with probability level	Adjusted R2	Increase in R2	Variation Explained in percent
Agricultural Knowledge	0.435	5.898(00)	0.417	0.417	41.7
Innovativeness	0.205	3.497(0.001)	0.478	0.061	6.1
Level of education	0.141	2.403(0.017)	0.498	0.02	2
Aspiration	0.193	2.672(0.008)	0.513	0.015	1.5
Family Income	0.149	2.549(0.012)	0.531	0.018	1.8
Total				0.531	53.1

Multiple R = 0.739
R-square = 0.546
Adjusted R^2 =0.531
F-ratio = 35.593

Standard error of estimation = 11.05
Constant = -24.61
Source: Research Findings (2023)

The multiple R and R^2 values were found 0.739 and 0.546 respectively and the corresponding F-ratio was 35.593 which was significant at 0.000 levels. For determining the unique contribution of knowledge on the effectiveness of Union Digital Center in the utilization of agricultural information of each of the five variables the increase in R^2 value was determined. These five variables had a 53.1 percent contribution to the effectiveness of Union Digital Center in the utilization of agricultural information. Agricultural knowledge had the highest contribution 41.7 percent of the variation followed by innovativeness 6.1 percent, level of education 2 percent, family income 1.8 and aspiration 1.5 percent variation in the effectiveness of Union Digital Center in the utilization of agricultural information. Table 5 showed that level of education, family income, innovativeness, agricultural knowledge and aspiration had significant contributions to the effectiveness of Union Digital Center in the utilization of agricultural information i.e. the farmers who had more level of education, family income, innovativeness, agricultural knowledge and aspiration were found to gather more information from UDC, some predictive importance has been briefly discussed below:

Agricultural knowledge

From stepwise multiple regressions, it was found that the agricultural knowledge of the respondent had the highest (41.7 percent) contribution to the effectiveness of Union Digital Center in the utilization of agricultural information.

There is a saying that ‘knowledge is power’. Actually, knowledge is a very sharp effective weapon to change fortune. The farmers having more agricultural knowledge can practice or adopt improved farming operations. The other farmers with poor or inadequate agricultural knowledge may likely contact knowledgeable farmers for agricultural information. In this way, the extent of contact with UDC may be increased in the community.

Innovativeness

Stepwise multiple regressions revealed that the innovativeness of the respondents had a 6.1 percent contribution to the effectiveness of Union Digital Center in the utilization of agricultural information. The findings indicated that the higher the innovativeness of the farmers, the higher the effectiveness of UDC.

Level of education

Stepwise multiple regressions revealed that the level of education of the respondents had a 2 percent contribution to the effectiveness of Union Digital Center in the utilization of agricultural information.

Education helps the farmers to face adverse conditions and adjust to unfavorable conditions through reading leaflets, booklets, books and other printed materials in this case. Education helps the farmers to broaden their outlook and expand their mental horizons by helping them to

develop proper attitudes and perceptions to decrease the knowledge gap about the production technology of crops. An educated man is relatively more responsive to technology, and new innovation. S/he can easily contact various extension agent and make frequent contact with other information sources, which make them able to acquire adequate accurate information. Such consideration indicates the need for improving literacy levels among the farmers for receiving, understanding and applying agricultural information in their field.

Family Income

From stepwise multiple regressions, it was found that the respondent's family income had a 1.8 percent contribution to the effectiveness of Union Digital Center in the utilization of agricultural information. The findings are quite logical because the effectiveness of UDC influences the respondents to adopt improved farming practices, increasing farm output and eventually improving their families' financial condition. Respondents having high family income may be interested to increase their living standard and also influence to receive more information on crop production.

Aspiration

From stepwise multiple regressions, it was found that the aspiration of the respondents had a 1.5 percent contribution to the effectiveness of Union Digital Center in the utilization of agricultural information.

The above findings indicated that the respondents having more aspiration make capable of being more confident. More confidence makes more working spirit among people and thus they earn more. The man, who has some cash or asset, wants to have more. It is a natural desire of human beings. It may be concluded that the more the aspiration of the farmers the more the effectiveness of UDC.

3.5 Constraints Faced Index in the Effectiveness of Union Digital Center (UDC) in the Utilization of agricultural information

The observed constraints faced index in receiving agricultural information from UDC ranged from 128 to 325 against the possible range of 0 to 462. The selected ten problems faced by the respondents were arranged in rank order according to their descending order of constraints faced index (CFI) as shown in Table 6

Table 6 Rank order of 10 selected constraints faced by the respondents in receiving agricultural information from UDC with rank order

Constraints	The Extent of Constraints Faced by the Farmer				CFI	Rank Order
	No Constraints (0)	Low Constraints (1)	Medium constraints (2)	High Constraints (4)		
Negative attitudes and obstacles from	72	40	38	4	128	10

local leaders						
Lack of cooperation of entrepreneurs	0	67	54	33	274	2
Lack of information-receiving capacity of the members	64	46	41	3	137	8
Lack of proper internet facility in UDC	50	71	31	2	141	7
Lack of efficiency of the personnel working in UDC	53	53	45	3	152	5
Lack of interaction among CIG_s	53	53	48	0	149	6
Lack of proper knowledge of modern agricultural information by the officers	55	65	33	1	134	9
Shortage of employee in Union Digital Center	36	11	7	100	325	1
Lack of courage to take entrepreneurship initiatives	51	55	46	2	153	4
Lack of regular publication on agricultural information from UDC	49	54	49	2	158	3

CFI= Constraints Faced Index

On the basis of CFI, it was observed that 'Shortage of employee in Union Digital Center' ranked first followed by 'lack of co-operation of entrepreneurs', 'lack of regular publication on agricultural information from UDC', 'lack of courage to take entrepreneurship initiatives', 'lack of efficiency of the personnel working in UDC', 'lack of interaction among CIG_s', 'lack of proper internet facility in UDC', 'lack of information receiving capacity of the members', 'lack of proper knowledge on modern agricultural information by the officers' and 'Negative attitude and obstacles from local leaders'

4. CONCLUSION:

The Union Digital Center offers a wide range of services and information to the local population in Bangladesh, where it has a minor impact on how farmers use agricultural information. The respondents' agricultural knowledge had the largest impact on the effectiveness of Union Digital Center in utilizing agricultural information. Therefore, agricultural knowledge should be

strengthened at both the farmer and UDC staff levels. The results of stepwise multiple regressions revealed that the respondent's family income significantly influenced how well the Union Digital Center (UDC) used agricultural information. It is possible to draw the conclusion that respondents with greater family incomes were more likely to use agricultural information from the Union Digital Center (UDC) more effectively. The majority of respondents said their involvement with UDC had led to modest effectiveness. It is possible to draw the conclusion that UDC has a minimal impact on how farmers use agricultural information. The respondents' agricultural knowledge made the biggest impact on the Union Digital Center's (UDC) ability to effectively use agricultural information. The Union Digital Center (UDC) used agricultural information more effectively with respondents who had higher knowledge of agriculture. Farmers' innovativeness provided a substantial contribution to the Union Digital Center's (UDC) ability to effectively use agricultural data. It is possible to draw the conclusion that as farmer innovation grows, so will the Union Digital Center's (UDC) efficiency in utilizing agricultural information. Comparatively, the farmers from Union Digital Center used the least effective information, "fruits processing techniques," while the highest effective information was "compost preparation," followed by "tree plantation," "recommended seed rate," and "recommended varieties.". Therefore, it may be concluded that farmers attempt to make use of that vital knowledge in their agricultural activities. Farmers experienced the most difficulties due to the lack of staff at the Union Digital Center, and improved services for farmers and those working in agriculture should be provided by hiring agriculturists with the necessary training.

Disclaimer

This paper is an extended version of a Thesis document of the same author.

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RECOMMENDATIONS:

To improve the effectiveness of the Union Digital Center in using farmers' agricultural information, the following measures should be taken:

- Union Digital Center needs a lot of publicity so that everyone knows about it. For sustainability of their utilization at a more increased level, authorities may arrange motivational campaigning, and prepare posters and leaflets about UDC.

- An interdisciplinary (crops, livestock, fisheries etc.) technical expertization for strengthening the “Farmers Information and Advice Center (FIAC),” within the framework of UDC need to be emphasized for achieving its full potential it.

- There should be appointed more skilled sector-specific manpower and technical expertise at the union level. Therefore, more common interest groups will be trained and information transfer will be easier than the present situation.

- The Union Digital Centers (UDCs) more specifically Farmers Information and Advice Center (FIAC) need to arrange training of a reasonable duration in crop cultivation involving as many farmers as possible who will be in turn arrange training for their neighbor farmers. The philosophy is 'let farmers be the teacher of other farmers'. More than three-fourths (78.8 percent) of the farmers were young and middle-aged and they should be encouraged in receiving training organized by FIAC.

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6. COMPETING INTERESTS

No Competing interests exist

7. AUTHORS' CONTRIBUTIONS

Authors MSI, MRI and TM designed the study. Authors MMA, NM and DD performed all the statistical analyses. Data collection was done by authors MSI and MRI. Authors TM, MMA, and NM made the rough draft and all authors edit the final draft.

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