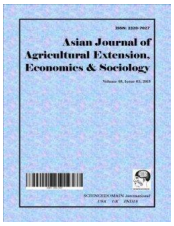

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Assessing Agricultural Extension Professionals Opinion towards Sustainable Agriculture in Bangladesh

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Authors' contributions

This work was carried out in collaboration between all the authors. Author SSH contributed to the research design, organized the research flow, data analysis and interpretation. Author MZT contributed to the data collection and data preparation. Author MKG contributed to the manuscript editing. Author MIK contributed to the interpretation of the results. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The farmers of Bangladesh is producing extra food for huge number of people by injudicious use of agro-chemicals thereby damaging the ecosystem and hampering the sustainability. For checking this ill practice, it requires shifting of good practice to the farmers by the extension agent although information gap exists regarding extension professionals opinion towards sustainable agriculture. The main target of this study is to chalk out the extension professional opinion towards

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sustainable agriculture in Bangladesh.
Study Design: A descriptive survey research design is followed for the study and mailed questionnaire is the main instrument of the research.
Place and Duration of Study: Data were collected from the Sub Assistant Agriculture Officers (SAAOs) under the department of Agricultural Extension (DAE) of five Upazilas (the lowest administrative unit of the country) of five Districts. The Upazilas were Sadar Upazila of Gazipur District, Sadar Upazila of Gaibandha District, Kaliganj Upazila of Jhenaidah District, Chakaria Upazila of Cox's Bazar District and Jhuraicharri Upazila of Rangamati District.
Methodology: A total number of 165 SAAOs of the five Upazilas were the population and out of the collected questionnaire from the SAAOs, 115 were treated as the sample of the study. The questionnaire was developed according to the objective of the research. For judging the opinion five point Likert scale was used. Multiple regression analysis was administered using SPSS for finding out the influence of extension professionals socio-demographic characteristics on their opinion towards sustainable agriculture.
Results: The extension professionals had moderate to low level of opinion towards sustainable agriculture. Three characteristics (eg. in-service training, in-service sustainable agriculture training and environmental consciousness) had influence on the opinion according to the regression results.
Conclusion: There is a need to arrange different types of in-service training related to sustainable agriculture. Future research is needed with incorporation of other variables along with the current one to get more robust results.

Keywords: Extension professional; opinion; sustainable agriculture; Sub Assistant Agriculture Officers (SAAOs); Bangladesh.

1. INTRODUCTION

Bangladesh is mainly rural and agricultural governed [1] one of the least developed countries of the globe [2]. Agriculture is one of the largest producing sectors of the economy of Bangladesh as it has an agrarian economy and the agriculture sector comprises about 18.70% during the fiscal year of 2012 to 2013 of the country's GDP [3]. White et al. [4] defined agricultural sustainability is the ability of a system of maintaining stable production level and quality of agricultural commodities without hampering the environment and economic profitability. Report from the FAO [5] indicates that the food production of the world has been increased since the 1960s as a result of increasing agricultural production and the food production accounts for an increase of 145%. However, the production of foods was increased by 280%, 140% and 200% in Asia, Africa, and Latin America, respectively. After the independence of Bangladesh during 1971, the agriculture has changed excessively and crop production has increased due to the adoption of modern technologies and mechanization in agriculture, use of chemical, specialization and government policies [6]. However, soil fertility has decreased as a result of the absence of restoration of the soil nutrients by the farmers. Currently, two strategies are followed for increasing national production, i.e., increasing cropping intensity and increasing yield per crop. The findings of Hatirli et al. [7] also noted that recently agricultural systems depended massively on using different types of chemical inputs. The increasing use of these synthetic chemicals results in soil and water contamination, out breaking different types of pests and diseases, degrading the food quality and creating environmental problems [8] and affecting human health [9]. Although the soil fertility related issues are very important for overall integrated management of plant nutrition [10] and in Bangladesh excessive and imbalance chemical fertilizer use is a critical matter of reduced crop yield and degrading environment [11]. Hence, all these factors help human societies to think critically to finding out suitable solution and accelerating to adopt sustainable agriculture. Moreover, organic matter percentage of Bangladesh soil is much lesser is also a cause of concern. Islam [12] reported that organic matter content in Bangladesh soils is below 1% in about 60% of the cultivable lands. Currently dramatic changes have been noticed in agricultural productivity, consumers attitude and behavior over food [13] as well as the political economy of agricultural production and food [14]. But the agricultural systems are now perceived as a powerful source of environmental damage [15,16,17]. This causes un-sustainability in agriculture. For making the agriculture sustainable, at first adequate number of extension workers is required and they should

have proper knowledge on sustainable agriculture to transfer the technology to the farmers and finally the farmers have intention to adopt the technology.

Adequate information is necessary for the adoption of an innovation and different sources like extension professionals, researchers, scientists, graduates of the universities etc. can spread this information to the end users that is the farmers [18]. Meanwhile, researchers around the world (example: [19-22] studied the issue related to adoption and dissemination of technology to the farmers. However, extension professionals should be motivated first on the important issues of sustainability and then try to convince and train the farmers towards that [23]. In Malaysia, Tiraieyari et al. [24] indicated that extension professionals attitude towards sustainable agriculture were the important cause of effective sustainable agriculture. Through another study, Liaghati et al. [25] proved that attitude is an important element of the human behavior that could guide and perform of human being. The findings from Udoto and Flowers [26] also exhibited that the extension professionals positive attitude towards sustainable agricultural practices motivated the extension professionals to transfers this technology to the farmers. Fishbein and Ajzen [27] opined that one's performance in any field was the expression of one's opinion or attitude towards it. Grossman [28], explained an attitude or opinion as a tendency to answer to a concept or a position in a particular way which is mostly considered as a perception to guide individual's behavior. Wheeler [29] conducted a research on factors influencing agricultural professional views towards organic agriculture and concluded that extension professional's decision making did not depended not only on scientific findings and innovation but also some other factors like knowledge, experience, information, education, occupational effect and attitudes on individual aspects of organic agriculture. Many researchers have done their research to judge the extension professionals role of transferring the technologies to the farmers [18,24,26,30-34]. So extension professionals require proper knowledge and positive attitude towards sustainable agriculture to influence the farmers.

The government of Bangladesh plans to ensure the sustainable environment and protecting the country from global warming and detrimental climatic effects [35]. Therefore, the opinion of the extension professionals towards sustainable agriculture is important to transfer the sustainable agricultural practices to the farmers. This thinking helped us to conduct this type of research in Bangladesh. In this connection, the current study was undertaken with the Sub Assistant Agricultural Officers (SAAOs) under the Department of Agricultural Extension (DAE), so that the SAAOs have direct contact with the farmers. Through this study, we investigated the opinion of the extension professionals towards sustainable agriculture. Additionally, we also examined the influence of some selected socio-demographic characteristics of the professionals on their opinion towards sustainable agriculture.

2. METHODOLOGY

Descriptive survey research design was followed in the current study and questionnaires were used as the instrument for data collection. The respondents of this study were the Sub Assistant Agriculture Officer (SAAO). The SAAOs are the grass root level agricultural extension professionals of Bangladesh who works in the Department of Agricultural Extension (DAE) under the Ministry of Agriculture (MoA) of Bangladesh. We selected purposively five Upazila of five districts as the study area. The Upazilas were Sadar Upazila of Gazipur District, Sadar Upazila of Gaibandha District, Kaliganj Upazila of Jhenaidah District, Chakaria Upazila of Cox's Bazar District and Jhuraicharri Upazila of Rangamati District. Total number of SAAOs in all of the five Upazilas was 165 which were the population of the study. We converted the English questionnaire into the Bengali language for easily understandable to the respondents. We also divided the questionnaire into two parts: (a) personal and professional characteristics of the extension professionals and (b) their viewpoint towards sustainable agriculture. In the second part of the questionnaire, we employed 20 opinion measurement items [2,36-40]. We then mailed those questionnaire to all of the 165 SAAOs and got returned of 121. Of the returned questionnaire, a total number of 115 (about 95%) were usable and were considered as the sample of the study. The entire data collection took 45 days during December 2015 to February 2016.

2.1 Variables and Their Measurement

2.1.1 Measurement of dependent variables

Agricultural extension professionals (SAAOs) opinion towards sustainable agriculture is the dependent variable of this study. We employed

twenty statements for judging the opinion of the SAAOs which were further grouped into four areas of sustainable agriculture, namely, production, environmental, economic and social viability [24]. Although many scales have been developed for measuring the opinion, but the Likert scale is the most widely used technique of opinion measurement [41]. Fixed choice responses are utilized in Likert-type or frequency scales for measuring opinion or attitude [42,43]. For the current study, we occupied five points Likert scale [36,37,44] and the respondents were asked to indicate their extent of agreement and disagreement on each of the twenty statements. The assigned scores were 5, 4, 3, 2 and 1 against strongly agree, agree, neither, disagree and strongly disagree, for positive statements, respectively and vice versa for negative statements.

2.1.2 Calculating reliability of opinion statements in the questionnaire

Measuring the reliability of the instruments in the questionnaire, Cronbach's Alpha test is utilized. It is the indexing of reliability associated with the variation and the Alpha coefficient varies from 0 to 1 [45]. When the inter-correlation amongst the test items increase, the Cronbach's Alpha will increase. The Cronbach's Alpha was calculated with the following formula:

$$\alpha = \frac{K\overline{C}}{(\overline{v} + (K\text{-}1)\ \overline{C})} \quad (1)$$

where, K is as above, $\overline{v}$ is the average variance of each component (item), and c is the average of all covariances between the components across the current sample of persons (that is, without including the variances of each component).

The Cronbach's Alpha of 15 respondents' opinion statement is 0.801 (Table 1) for the current study. While researchers [46-48] provided commonly accepted rules of thumb to describe internal consistency of the values of Cronbach's Alpha, like, > 0 .9 is Excellent, > 0.8 is Good, > 0.7 is Acceptable, > 0.6 is Questionable, > 0.5 is Poor, and < 0.5 is Unacceptable. So the opinion statements used for the current study were reliable according to the Cronbach's Alpha.

2.1.3 Measurement of independent variables

A total number of seven independent variables are used for the study. These are extension professional's age, educational level, extension

Table 1. Item analysis from SPSS output

Item total statistics	Scale mean if item deleted	Scale variance if item deleted	Corrected item total Correlation	Cronbach's Alpha if item deleted
Item 1	72.133	26.981	0.134	0.779
Item 2	71.800	23.457	0.838	0.739
Item 3	71.933	24.210	0.660	0.749
Item 4	72.333	27.524	0.088	0.779
Item 5	72.533	23.695	0.424	0.761
Item 6	74.333	31.095	0.438	0.830
Item 7	72.067	20.495	0.658	0.736
Item 8	72.000	24.143	0.688	0.748
Item 9	71.867	23.410	0.831	0.738
Item 10	72.200	27.029	0.146	0.778
Item 11	72.315	26.476	0.034	0.802
Item 12	72.667	26.381	0.132	0.784
Item 13	72.933	26.781	0.022	0.801
Item 14	71.933	23.781	0.751	0.743
Item 15	72.867	25.838	0.243	0.774
Item 16	72.200	26.314	0.316	0.770
Item 17	71.933	23.781	0.751	0.743
Item 18	72.000	24.857	0.537	0.757
Item 19	73.200	23.457	0.503	0.754
Item 20	72.266	27.210	0.135	0.778
Reliability coefficient for case 15			**Cronbach's Alpha**	**Standardized Item Alpha**
			0.801	**0.816**

service experience, in-service training experience, in-service sustainable agriculture training experience, environmental awareness and sustainable agricultural knowledge. Age of the extension professionals was measured based on actual length of his life and expressed in years. Minimum educational qualification requirement of the extension professionals in Bangladesh is Diploma in Agriculture Degree which s/he needs to obtain with Technical education system starting after Secondary School Certificate (SSC), after Higher Secondary Certificate (HSC), after Bachelor and after Masters Degree and the respondents are given a score of 1, 2, 3, and 4, respectively.

Extension service experience of a respondent is the service experience time in agricultural extension work under the Department of Agricultural Extension (DAE) and is expressed in years. We determined the training experience for the current study by the total number of training that an extension worker attended in his/her total service time from different agricultural as well as other organizations. Similarly, sustainable agriculture training experience was measured by the total number of training that a respondent obtained especially on sustainable agriculture from different organizations related to agriculture in Bangladesh. Meanwhile, environmental consciousness of the respondents on different issues related to the environment was determined by using a 4-point Likert-type scale like; strongly agree, agree, disagree and strongly disagree and assigned scores were given as 4, 3, 2, and 1, respectively to measure the quantity of the variable. Moreover, agricultural extension professional's knowledge on sustainable agriculture was measured by answering 19 questions related to sustainable agriculture. The respondents were asked to answer the questions and score was assigned for each correct answer as 2, each partial correct answer as 1 and each incorrect answer as 0.

2.2 Statistical Analysis

Statistical Package for Social Science (SPSS) was used to analyze the data. Descriptive statistic including the mean and standard deviation was measured to achieve objectives of the study. Throughout the study, different categories were used for classifying the data. According to the purpose of the study, different statistical tests like frequency count, percentage, mean, and standard deviation were applied to analyze and interpret the data. Moreover, we re-coded the original values of different variables to ensure the regression model estimating truly the mean differences at level of categories.

We utilized multiple regressions with 0.05 and 0.01 level probabilities for exploring the relationship and quantifying the influence of the socio-demographic characteristics and the opinion of the extension professionals towards sustainable agriculture in this study. The multiple regression works with the following formula:

$$y = \beta_o+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_k x_k+\epsilon \quad (2)$$

where, y is the probability of opinion as the dependent variable under the given independent variables: X_1, X_2 ……., X_n indicate the variables such as age, education level, extension service experience, training experience etc, while β_1, β_2, ……., β_n are the coefficients of regression analysis of independent variables. β_0 is the constant.

3. RESULTS AND DISCUSSION

3.1 Results

Seven socio-demographic information of the agricultural extension professionals, namely, age, education level, extension service experience, in-service training experience, in-service sustainable agricultural training experience, environmental awareness and sustainable agricultural knowledge are displayed in Table 2. The table represents categories, frequencies, and percentage for all of these socio-demographic variables. Data exhibited in the Table 2 showed that most percentages of extension professionals (35.7%) were in between 31 to 40 years of age compared to 30.4% were in between 51 to 60 years and 22.6% were in between 41 to 50 years of age. When the extension professionals education level was taken into consideration, it is evident that the most percentage that is 58.3% and 32.2% of the respondents obtained their Diploma in Agriculture degree after completing Secondary School Certificate (SSC) and after Higher Secondary Certificate (HSC) examination, respectively.

We see, 47% of the agricultural extension professionals of the study areas have less than 10 years of extension service experience, while 53% of them have more than 21 to 38 years of extension service experience. Data presented in the table showed that about 75% of the extension professionals received less than 10 in-

service training during their service period although a high percentage (77.4%) of the extension professionals received no training on sustainable agriculture and related issues during their service period under the Department of Agricultural Extension (DAE). The findings in the table exhibits that most (95%) of the extension professionals showed moderate to high level of environmental consciousness. Meanwhile, the extension professionals had good sustainable agricultural knowledge so as about 93% of them answered 51 - >90% more accurately.

3.1.1 Extension professionals opinion towards sustainable agriculture

The opinion of the extension professionals towards sustainable agriculture was the main theme of this article and was measured by collecting their opinion of different statements (here 20). We grouped the statements into four (Table 3), namely, production, environmental, economic and social viability of sustainable agriculture. Table 3 represents the mean and standard deviation of different individual opinion items of the extension professionals. Six statements were used to determine the production aspect of sustainable agriculture. The statement of "Technology must be appropriate to increase agricultural production efficiency" had the highest mean of 4.34 (also SD was 0.75) and which was followed by the statement of "Sustainable agriculture is useful to maintain long-term production of the farm" (Mean = 4.06, SD = 0.89) that was ranked second.

When the opinion of the extension professionals towards environmental aspect of sustainable agriculture was considered, then out of the six statements, the statement, namely, "Sustainable agriculture practices are useful for protecting the environment" had the highest mean and that was 4.18 (SD was 0.62) which was followed by the opinion of "Planting more trees is perceived as an indicator of sustainable agriculture" had a mean of 3.89 and SD=0.86. Meanwhile, out of three statements of economic aspects of sustainable agriculture, the statement of

Table 2. Demographic profiles of the agricultural extension professionals (n = 115)

Variable	Categories	Frequencies	%
Extension professional's age	24-30 years (min. age)	13	11.3
	31-40 years	41	35.7
	41-50 years	26	22.6
	51-59 years (max. age limit)	35	30.4
Education level	Diploma after SSC	67	58.3
	Diploma after HSC	37	32.2
	Diploma after Bachelor	8	7.0
	Diploma after Master	3	2.6
Extension service experience	Length less than 10 years	54	47.0
	Length 11-20 years	0	0.0
	Length 21-30 years	38	33.0
	Length 31-38 years (max)	23	20.0
In-service training experience	No. less than 10	86	74.8
	No. 11 to 20	22	19.1
	No. 21 to 30	4	3.5
	No. more than 31	3	2.6
In-service sustainable agricultural training experience	No training on SA	89	77.4
	No. fewer than 10	20	17.4
	No. 10 to 20	5	4.3
	upto 20	1	0.9
Environmental consciousness (EC)	Low EC (score less than 25)	5	4.3
	Moderate EC (score 26-30)	58	50.4
	High EC (score more than 30)	52	45.2
Knowledge on sustainable agriculture	>90% correct SA knowledge	2	1.7
	81-90% correct SA knowledge	27	23.5
	71-80% correct SA knowledge	48	41.7
	61-70% correct SA knowledge	21	18.3
	51-60% correct SA knowledge	11	9.6
	<50% correct SA knowledge	6	5.2

"Research emphasis should be given to less investment potentiality crops" had the maximum mean with 4.23 and SD was 0.69.

According to the Table 3, when the social aspects of sustainable agriculture were taken into consideration, the statement, as "It is an important duty to inform farmers to adopt SA practices" was ranked first (Mean = 4.39, SD = 0.51) followed by "Extension programs are needed for informing and educating the farmers on SA" (mean = 4.34) and "Sustainable agriculture practices improve the quality of life for both farmers and society as a whole" whose mean was 4.14.

3.1.2 Extension professionals overall opinion towards sustainable agriculture

Extension professionals overall opinion scores towards sustainable agriculture were measured in this section. The overall opinion scores ranged from 46 to 91, with an average was 75.57. The respondents were classified into three categories based on their overall opinion scores on sustainable agriculture. In their researches, Hasan et al. [36] and Ghosh and Hasan [37] also classified the attitude scores of the respondents into three classes like the current classification. The findings are shown in Table 4.

Table 4 represents that about 88% extension professionals of the study area had moderate to low level of opinion towards sustainable agriculture. The findings indicate that in-service training related to sustainable agriculture for the extension professionals might be a crucial factor to develop the opinion towards sustainable agriculture. Findings from Islam et al. [49] on the perception of agriculture extension agents towards sustainable agricultural practices in Bangladesh exhibited that most percentage

Table 3. Mean and standard deviation of extension professional's opinion towards different sustainable agricultural parameters

Statement	Mean	SD
Production viability		
Technology must be appropriate to increase agricultural production efficiency	4.34	0.75
SA is useful to maintain long-term production of the farm	4.06	0.89
SA practices are advantageous to agriculture	3.98	0.58
Agroforestry system is important for agricultural production	3.81	0.86
SA practices are difficult to apply	2.40	1.06
SA system should produce enough food for the whole world population	3.94	0.89
Overall	**3.76**	**0.84**
Environmental viability		
SA practices are useful for protecting the environment	4.18	0.62
Uses of chemical fertilizers are declined due to use of SA	3.82	0.66
Few fungal diseases can effectively be controlled without the use of fungicides in SA	3.12	1.92
Recycling of agricultural wastes are possible through SA	3.76	0.91
Plantation of more trees is perceived as an indicator of SA	3.89	0.86
Most of the insects can be controlled without the use of chemical insecticides	3.48	1.01
Overall	**3.70**	**0.99**
Economic viability		
Research emphasis should be given to less investment potentiality crops	4.23	0.69
Many SA practices that may be successfully adopted in other parts of Bangladesh, may economically be feasible to grow at this region	3.68	0.87
Agricultural system that utilizing crop rotation, green manure and animal manures can be economically comparable to traditional system that uses synthetic fertilizer	3.79	1.07
Overall	**3.89**	**0.87**
Social viability		
It is an important duty to inform farmers to adopt SA practices	4.39	0.51
The exercise of SA is less because the farmers have limited knowledge on that	4.04	0.79
Extension programs are needed for informing and educating the farmers on SA	4.34	0.57
SA practices should be considered only in agriculture	2.50	0.95
SA practices improve the quality of life for both farmers and society as a whole	4.14	0.68
Overall	**3.88**	**0.70**

Note: Score 1 = Strongly disagree, and Score 5 = Strongly agree

Table 4. Distribution of the respondents according to their overall opinion towards sustainable agriculture

Categories	Number	Percentage	Mean	SD
A. Low opinion (score less than 70)	17	14.80		
B. Moderate opinion (score 71 to 82)	84	73.00	75.57	6.43
C. High opinion (score more than 82)	14	12.20		
Total	**115**	**100**		

Note: A = Low: Mean – 2SD < B ≤ Mean – SD; B = Moderate: Mean - SD < C < Mean +SD; C = High: Mean + SD≤ D < Mean + 2SD

(51.25%) of the extension agents had medium perception followed by 37.5% and 11.25% had high and low perception, respectively.

3.1.3 Influence of extension professionals socio-demographic characteristics upon their opinion

The socio-demographic characteristics of the extension professionals had influence upon their opinion towards sustainable agriculture. The findings from Table 5 indicate the socio-demographic characteristics of the extension professionals which influence their opinion towards sustainable agriculture. From the regression analysis of the table, it is seen that among the seven characteristics, three were found to be statistically significant and which were, 1) in-service training experience; 2) sustainable agricultural training experience and 3) environmental consciousness that influences on respondents opinion towards sustainable agriculture. These variables together explained 24.7% of the variance of effective factors on extension professionals opinion towards sustainable agriculture. As such these variables were found to be important for the extension professionals opinion development. It was found that the extension professionals who had one or more of these characters at the higher level, had the higher level of opinion towards sustainable agriculture and it also made them easy to adopt and transfer the concept of sustainable agriculture to the farmers.

Shiri et al. [18] in their study on attitude of agricultural extension professionals towards organic farming in Iran also found that the extension professionals using more sources of data, using more internet, reading more scientific magazines and research journal and also watching more TV had more favorable attitude towards organic farming. They concluded that the extension professionals exposed more to information contacts of different types showed more positive attitude towards organic farming. The current research also shows the similar type of finding. In another study, Islam et al. [49] worked on the perception of extension agents on sustainable agricultural practices in Bangladesh and found the positive and significant relation of environmental awareness and perception. They also concluded that environmentally conscious person could exert more effort towards practicing sustainable agriculture and the more attentive persons were likely to be more responsive to new ideas or innovation.

3.2 Discussion

We selected only seven socio-demographic characteristics of the agricultural extension professionals during this study in Bangladesh. But there are still some other characteristics that

Table 5. Extension professionals characteristics and their influence on opinion towards sustainable agriculture

Variables	Coefficient (b)	SE	t -value	p
Extension professional's age	-0.315	0.245	-1.283	0.202
Education level	-0.520	0.754	-0.689	0.492
Extension service experience	0.228	0.202	1.128	0.262
In-service training experience *	0.179	0.071	2.530	**0.013**
In-service sustainable agricultural training experience **	-0.487	0.160	-3.044	**0.003**
Environmental Consciousness (EC)**	0.588	0.191	3.083	**0.003**
Knowledge on sustainable agriculture	0.024	0.128	0.191	0.849

*R^2 = 0.248, Adjusted R^2 = 0.193, Critical Value of F = 4.524 (*p< 0.05, **p≤0.001)*

may influence their opinion towards sustainable agriculture. For example, the extension professionals contact with different information sources, their cosmopolitan behavior, aspiration towards extension services may have influences on their opinion towards sustainable agriculture. However, a future study could employ the current variables together with aforementioned variables to examine the extension professionals opinion towards sustainable agriculture might yield more fruitful decision-making results.

Integrated fertility and nutrient management of soil and plants is an important prerequisite for boosting up crop production through more sustainable way. There are a number of strategies developing for the future for increasing agricultural production and focusing on using available natural resources more effectively, efficiently, and sustainably than in the past [50]. According to the report of FAO [51], there was no scope to increase the net cultivable land in Bangladesh, hence, intensive cropping through integrated soil fertility and nutrient management could be one of the important ways to further increase of crop production. This adoption of sustainable agricultural practice require the farmers to take the decision regarding proper nutrient management that enhances their higher crop production and improves the soil fertility as a whole. So, there is a crucial role of the extension professionals to play in assisting the farmers to take their decision regarding the adoption of sustainable agricultural practices. Minarvic and Mureller [33] reported through their study that the extension professionals' knowledge and support for the sustainable agricultural concept is not favorable although the concept was recognized as very important. So for transferring the knowledge, skill, and management of sustainable agriculture to the farmers, it is important to generate desirable changes in the opinion of the extension professionals.

Through a study In the USA, Agunga [23] reported that the extension professionals of Ohio did not have a firm understanding of sustainable agriculture. This influenced them to be less interested in promoting sustainable agriculture. Various researchers [30,52] also identified extension professionals problems of understanding of the sustainability concept. Extension professionals in New England also had the doubting attitude towards sustainable agriculture [53].

The finding of the study of Pretty and Hine [54] mentioned that currently sustainable agriculture is implemented in only 3 percent of the total farming land of Asia, Africa, and Latin America. Singh and Osawaru [55] also indicated that one of the main obstacles of the adoption of sustainable agriculture is the lack of information for farm producers and way of disseminating this information to them. Barrow et al. [56] conducted a study in Cameron Highlands in Malaysia and concluded with similar type of findings that, adoption of sustainable practices was apparently less prompted by the efforts of the extension professionals.

The results of the study by Allahyari et al. [30] showed that attitude of Iranian agricultural extension professionals was not in favorable condition. The findings of the study conducted by Minarvic and Mureller [33] indicated that extension professionals' attitudes reflected that they recognized the importance of the sustainable agricultural concept and had knowledge on it, but when they asked about actions to be taken to apply it, there was no evidence of strong extension efforts.

According to the World Bank [57] and Toness [58], the role of extension professionals is very important to support sustainable agriculture. Karbasioun et al. [59] reported that extension workers low-level knowledge and skills' regarding sustainable agriculture is a major barrier among many barriers of the adoption of sustainable agriculture. Therefore, it is a great role of the extension professionals to promote sustainable agriculture and help to adopt this technique to the farmers. So they should have adequate competent and good orientation towards sustainable agriculture. It is a basic need for them to acquire enough understanding of the sustainable agricultural concept.

4. CONCLUSION

Most percentage (80%) of the respondents in this study were in between 24 to 50 years of age, while 90% of them obtained their diploma degree after SSC and HSC degree with 80% of the extension professional's tenure of extension services was in between 9 to 30 years. About 75% of the extension professional received less than or equal to 10 in-service pieces of trainings organized by mainly by the DAE, while 77% of them received no training exclusively on sustainable agriculture so far during their service career. All these characteristics might have the

impact on their opinion towards sustainable agriculture and related practices in their job sector.

About 88% of the extension professionals in the study areas had moderate to low opinion towards sustainable agriculture. In addition, in-service training received, sustainable agriculture training received of the workers, and environmental consciousness had to influence on their opinion towards sustainable agriculture. This may indicate that higher level of these three characteristics will result higher of their opinion towards sustainable agriculture. The extension professionals should be provided with different types of training programs related to sustainable agriculture. Hence their mother, i.e., the Department of Agricultural Extension (DAE) should redesign their current policy related to training of the extension professional to get more effective extension services.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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