Amity Journal of Management Research
1 (1), (1-19)

Agricultural Extension Officers' Attitude towards Organic Agriculture in Two Selected Districts in Sri Lanka

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Abstract

Organic agriculture is a farming method leading to sustainable agriculture. The relevant agricultural extension officers should gain better knowledge and have a positive attitude towards organic agriculture before educating farmers. However, it is difficult to find research studies related to agricultural extension officers' attitude towards organic agriculture in Sri Lanka. Therefore, this research aimed to study the agricultural extension officers' level of knowledge, their attitude towards organic agriculture, and the factors affecting their outlook towards organic agriculture. Badulla and Rathnapura districts were purposely selected for the study since these areas have a high potential for organic agriculture. A sample of 120 agricultural extension officers was selected by a stratified random sampling method. A field survey was conducted using a pre-tested questionnaire to collect data from the sample from 2017 to 2018. Data were analyzed using descriptive statistics, mean analysis, and binary logistic regression. The results revealed that most of the agricultural extension officers (68%) were male, and most of them (63%) belonged to 41-55 years age category. Out of the total sample, majority (72.9%) possessed a general knowledge about organic agriculture, and the main sources of information for agricultural extension officers were training programs, magazines, newspapers, and books. As per the mean analysis, agricultural extension officers had a positive attitude towards organic farming under five aspects, namely general knowledge on organic farming (=3.83), environment protection (=4.16), health factors (=4.33), marketing factors (=3.59), and social factors (=4.30). Moreover, results of the binary logistic regression revealed that only the training received on organic agriculture has a significant effect on their attitude towards organic agriculture. Therefore, provision of relevant necessary training and education of organic agriculture for agricultural extension officers will help to promote sustainable organic agriculture practices among the farmers in these two districts in Sri Lanka.

Keywords: Organic agriculture, sustainable agriculture, agricultural extension officers, attitude, Sri Lanka

JEL Classification: Q1, Q16

Paper Classification: Research Paper

Introduction

Organic farming, or organic agricultural system uses ecologically based pest controls and biological fertilizers derived largely from animal and crop wastes and nitrogen-fixing cover crops. Modern organic farming was developed as a response to the environmental harm caused by the

use of agrochemicals and synthetic fertilizers in conventional agriculture, and it has numerous ecological benefits (Adamchak, 2020). However, current agricultural systems are heavily dependent on synthetic fertilizer and other agricultural inputs (Timsina, 2018; Prasad, Kumar, & Varma, 2015), and widespread hazardous outcomes are associated with synthetic agricultural inputs (Zhang, Yan, Guo, Zhang, & Menjivar, 2018; Baksh, Ganpat, & Narine, 2015). At present, numerous organizations consider organic farming as a better solution that addresses the issues obtained with the harmful effects of chemical farming (Adamchak, 2020; Reganold & Wachter, 2016; Kings & Ilbery, 2012). Organic agriculture is a farming method leading to sustainable agriculture (Skoufogianni, Solomou, Molla, & Martinos, 2016). The relevant agricultural extension officers should gain better knowledge and have a positive attitude towards organic agriculture before educating farmers (Shiri, Faghiri, Pirmoradi , & Agahi, 2014). Today, many nations consider organic farming as the answer to the problem of harmful effects of chemical farming. For instance, according to high consumer demand for sustainable foodstuffs in European Union during the past few years, the organic farming area increased by 70 %, and organic sales have reached 34 billion Euros in the year 2017 (European Commission, 2019). Hossain & Lim , (2016) reported that many countries in the Asian region had taken steps to endorse national standards, rules, and regulations to promote organic and ecological agriculture, whereas 21 out of 48 Asian countries are fully executing national standards; and five countries, i.e., Nepal, Bangladesh, Pakistan, Kyrgyzstan, and Jordan are preparing frameworks to follow the same.

Review of Literature

Findings related to some studies of organic farming proved that the economics of organic agriculture is characterized by optimizing profits through reduced water use, lower expenditure on fertilizer and energy, and increased retention of top soil. The absence of synthetic fertilizer use in organic farming helps to protect soil microbes that are highly responsible for nourishing soil. Many studies have proved that organic farming has no significant yield reduction as compared to conventional agriculture (Campion, Oury, Heumez, & Rolland, 2020; Schrama, de Haan, Kroonen, Verstegen, & Van der Putten, 2018). On the whole, organic agriculture works better than conventional agriculture. Further, it generates environmental benefits such as lack of soil pollution, enhancement of soil conditions, and reduction in water requirement (Ulm, et al., 2019). According to Schrama, de Haan, Kroonen, Verstegen, & Van der Putten, (2018), the yield difference between organic and conventional agriculture is a matter of the time factor. In organic agriculture, releasing nutrients and altering soil properties are comparatively slow activities. There is a possibility of producing sufficient amount of organic foods on a global per capita basis to sustain the current increasing human population, and potentially an even larger population based on future forecasting, without increasing the agricultural land area. Organic agriculture has a higher potential to contribute substantially to the increasing global food demand while minimizing the harmful effects of non-organic agriculture (Muller, et al., 2017; Badgley & Perfecto, 2007)

The first step of shifting unsustainable agriculture to sustainable agriculture is improving the level of education of extension workers to build a good understanding of the concept of organic farming and its practices (Mustapit, Sunartomo, & Rokhani, 2019; Veisi, Liaghati, & Alipour, 2016). According to Sodjinou, Glin, Nicolay, Tovignan, & Hinvi, (2015) the extension workers should adequately realize the value of organic farming sustainability to educate extension workers as well as farmers. Attitude is the primary factor of human behavior, and it provides proper direction and purpose to behavior and performance (Liaghati, Veisi, Hematyar, & Ahmadzadeh, 2007).Various factors (socioeconomic variables, information-seeking behavior of extension officers, personal and

business objectives, and food patterns at home) influence the attitude towards organic farming directly or indirectly through reciprocal actions (Saeidi, Moghaddam, & Ajili, 2012). The uptake of organic agriculture by a person is affected by his/her perception of "risk measurement," optimum profit and innovative advantages of agriculture, the reliability or unreliability of the agricultural innovations, availability of sufficient amount of information about the agricultural innovations, attitude towards "risk" and "un-confidence;" hence, transferring agricultural innovations to farmers is the major role of an agricultural extension officer (Yadav, Sood, Thakur , & Choudhary, 2013).

The current information about agricultural innovation is a significant and influential factor for the farmers to adopt change, and information could be transmitted to farmers by using different sources. Information sources of the farmers include extension officers, scientists, researchers, and university students. Researchers have mentioned that extension experts play conspicuous role in introducing agricultural innovations among farmers (Food and Agriculture Organization, 2019; Meijer, Catacutan, Ajayi, Sileshi, & Nieuwenhuis, 2015). Since organic agriculture is a new farming system for the farmers apart from chemical agriculture, farmers should be provided with the appropriate knowledge of organic farming.

Cherry (2020), stated that the attitude is, how, for, or against, positively or negatively, favorably or unfavorably, a person regards a particular object. This definition aims to reveal the idea that attitude contains consumer feelings and evaluations related to a specific purpose. Shiri, Faghiri, Pirmoradi , & Agahi, (2014) noted that the decision-making of agricultural extension officers is not merely dependent on the scientific findings of the technologies and innovations of agricultural scientists and researchers. The advocacy of innovations by agricultural experts, particularly extension workers, is not independent of their own values and beliefs and factors, including knowledge, experience, the level of education, and available agricultural information; the attitude towards sustainable agriculture would affect the view of the agricultural extension officers toward organic farming.

A study conducted by Haghjou, Hayati, Pishbahar , Mohammadrezaei, & Dashti, (2013) to identify professionals' attitudes towards organic farming concluded that an impressive level of knowledge of the agricultural experts about sustainable agriculture would enhance positive outcomes toward the agricultural extension of farmers. Further, they asserted that conservative or negative attitudes within the agricultural scientific and academic community are seen as a significant barrier to research and agricultural extension support, and hence the adoption of organic agriculture by farmers. Bouttes, Darnhofer, & Martin (2019) study showed that increasing agricultural knowledge played a decisive role in professionals' belief that organic farming produced economic benefits. However, other studies have concluded that knowledge of a particular subject influences people's attitudes towards that subject (Hsu & Chang, 2016; Pieniak, Aertsens, & Verbeke, 2010).

According to the findings of previous researchers, farmers who practice organic agriculture have complained about the negative attitude of the extension officers toward organic farming and their lack of knowledge about organic agriculture. Further, they have mentioned that these extension officers were frustrating other farmers in their uptake of organic farming practices (Ali, Ali, Hamad, & Khalifa, 2020; Farmer, Epstein, Watkins, & Mincey, 2014). Agriculture extension officers transmit necessary information to farmers according to their own attitude towards organic farming, and farmers are less interested in organic agriculture. Therefore, to advocate organic farming to farmers and extend this farming method as one of the sustainable farming methods, it is necessary to recognize the actual attitude of the extension officers of organic agriculture,

and the effect on developing organic farming method among farmers, since they are the people responsible for informing farmers and the general public through extension efforts. Also, improving the agricultural extension officers' attitude towards organic farming and optimizing the environmental-friendly agricultural practices is vital. Therefore, this study was conducted to investigate the agricultural extension officers' attitude towards organic farming in two selected districts of Sri Lanka. The specific objectives of the study were to identify the level of knowledge of agricultural extension officers on organic agriculture and the main information sources used by extension officers at present and evaluate agricultural extension officers' attitude towards organic agriculture and identify the factors affecting this attitude.

Methodology

This research was conducted in Badulla and Rathnapura districts of Sri Lanka, where many agricultural activities are performed. They have a high potential for organic farming than the other cultivating areas in the country (Sri Lanka Export Development Board., 2017). Mainly, tea, coconut, spicy crops (cinnamon and pepper), vegetables (tomato, wing beans, snake gourd, etc.), fruits (banana, papaya, etc.) are cultivated organically in these areas (Malkanthi, 2020; Vidanapathirana & Wijesooriya, 2014). Badulla and Rathnapura districts have ninety-eight (98) and ninety (90) agricultural extension officers, respectively. In both regions, most of the agriculture extension officers are diploma holders and a significant amount of them are degree holders. The agriculture extension officers were stratified as diploma holders and degree holders, and the respondents were randomly selected according to the proportion (Table 1). Finally, a sample of 120 agricultural extension officers (60 from each district) was selected for the study.

Table 1. Information about the selected sample of extension officers

Educational level	Badulla		Rathnapura		Both Districts	
	Freq*	Percen**	Freq*	Percen**	Freq*	Precen**
Diploma	33	55	36	60	69	57.5
Degree	27	45	24	40	51	42.5
Total	60	100	60	100	120	100
Freq*= Frequency; Percen**= Percentage						

A field survey was conducted using a pre-tested questionnaire to collect primary data. The respondents' attitudes were measured using 20 attitudinal statements with a five-point Likert scale. Each respondent was asked to indicate his/her perception against each statement with the five-point Likert scale as *strongly agree, agree, undecided, disagree,* and *strongly disagree*. Weights assigned to these responses were five, four, three, two, and one, respectively. A few group discussions were also held in addition to the survey. Data were analyzed by descriptive statistics, mean value analysis, and binary logistic regression using SPSS software version 21. In mean value analysis, the mean value was calculated using the following equation:

$$\text{Mean value} = \frac{5xSA+4xA+3xU+2xDA+1xSDA}{120}$$

Where,

SA = Respondents expressing their attitude 'Strongly Agree' for the statements

A = Respondents expressing their attitude 'Agree' for the statements

U = Respondents expressing their attitude 'Undecided' for the statements

DA = Respondents expressing their attitude 'Disagree' for the statements

SDA = Respondents expressing their attitude 'Strongly Disagree' for the statements

In binary logistic regression, the dependent variable was the "attitude of agricultural extension officers." If a respondent has selected strongly agree or agree on the situation for the relevant statement, it was coded as one (1) and considered as a positive attitude situation. If a respondent has selected undecided, disagree, or strongly disagree position for the relevant statement, it was coded as zero (0) and considered as a negative situation. Considered predictor variables were gender, age, marital status, level of education, service period, training received on general agriculture, and training received on organic agriculture. Initially, training was recorded as the number of training. Later, based on this information, the variable - training on organic agriculture, was categorized as *yes* (one) and *no* (zero) since some respondents had not participated in any training program on organic agriculture. Table 2 presents the measurements used for each variable.

Table 2. Measurements used for each variable in binary logistic regression

Variable		Measurement
Dependent variable	Attitude	First, use the Five-point Likert scale. Later, these five levels were converted into two options: a positive attitude (strongly agree & agree) coded as 1(one) and a negative attitude (undecided, disagree, and strongly disagree) coded as 0 (zero).
Predictor variables	Gender	Male (one), Female (zero)
	Age	Years
	Marital status	Married (one), Unmarried (zero)
	Service period	Years
	Educational level	Diploma (zero), Degree (one)
	Other training	Number of trainings
	Training on organic agriculture (OA)	Yes (one) No (zero)

Results and Discussion

Profile of Agricultural Extension Officers

Some significant demographic factors of agricultural extension officers such as gender, age, marital status, education level were noted. Few other factors such as service period and the number of training on agriculture and the number of training on organic agriculture were also identified, and they were analyzed within the real situation. Table 3 presents the results.

Table 3. Profile of agricultural extension officers (n=120)

Factor	Category	Badulla Percentage	Rathnapura Percentage	Both Districts Percentage
Gender	Male	56.7	56.7	68.0
	Female	43.3	43.3	33.0
Age	18-36	26.7	40.0	33.3
	37-55	73.3	53.3	63.3
	>55	00.0	06.7	03.3

Marital status	Married	83.3	81.7	83.0
	Unmarried	16.7	18.3	18.0
Educational level	Diploma	55.0	60.0	57.5
	Degree	45.0	40.0	42.5
Service period (Years)	01-10	30.0	38.3	34.2
	11-20	50.0	43.3	46.7
	21-30	16.7	18.3	17.5
	>30	03.3	00.0	01.7
No. of trainings on agriculture	0-5	80.0	83.3	81.7
	6-10	11.7	16.7	14.2
	11-15	03.3	00.0	01.7
	16-20	01.7	00.0	00.8
	>20	03.3	00.0	01.7
No. of trainings on organic agriculture	0	21.6	28.3	25.0
	1-5	66.6	63.4	65.0
	6-10	11.8	08.3	10.0

As per the results in Table 3, basic information of the respondents of both districts was more or less similar. A majority of the respondents in both districts were male (68%), married, and most (63.3%) were in the 37-55 years age category. Out of them, 57.5% were diploma holders, and 42.5% were degree holders, and most of them (46.7%) had a service period of 11-20 years. While a majority (81.7%) had participated in 1-5 numbers of trainings, most of them (65%) had undergone 1-5 trainings on organic agriculture.

The number of male extension officers was higher than female officers in Sri Lanka, but currently, the number of female extension officers is gradually increasing. The Sri Lankan population is getting older, and the middle-level people are higher at present. Sri Lanka has an eastern culture, where formal marriages and family life are prominent. Although agriculture diploma was the main qualification for extension officers, some officers had degrees, particularly in agriculture. Due to the lack of job opportunities, agriculture graduates also apply for 'Agriculture extension officer' vacancies. As most extension officers were middle-aged officers, they had a significant level of service periods.

Periodically, the government provides trainings on various aspects of agriculture for extension officers, but the number of trainings was not sufficient. Recently, the government started to provide training on organic agriculture. The findings of this study agree with Oladele & Tekena, (2010), who reported that agricultural extension officers in South Africa were mainly males, and still, the agricultural extension is a male-dominated activity. Alotaib, Yoder, Brennan, & Kassem,(2019) also reported somewhat similar findings, based on their study on the training needs of extension agents regarding organic agriculture in Saudi Arabia. They have mentioned that the number of training received by extension officers was minimal.

Agricultural extension officers' knowledge on organic agriculture

One open-ended question was included in the questionnaire to assess the knowledge level of respondents on organic agriculture. Respondents have marked three responses as "I have some knowledge," "I have general knowledge," and "I have very good knowledge." After studying the

situation, two options were chosen, since the first and second responses were more or less similar. Table 4 presents all information.

Table 4. Knowledge level of the respondents (n=120)

Knowledge level	Badulla		Rathnapura		Both Districts	
	Freq*	Percen**	Freq*	Percen**	Freq*	Percen**
Have a general knowledge	46	76.6	49	81.7	95	79.2
Have a very good knowledge	14	23.4	11	18.3	25	20.8
Freq*= Frequency; Percen**= Percentage						

As per the results of Table 4, most respondents in both districts (79.2 % = 76.6 % + 81.7 %) had a general level of knowledge on organic agriculture. However, a few of them (20.8 % = 23.4 % + 18.3 %) had a very good knowledge. These districts still receive government support for chemical agriculture, considering the food security of the country. Extension officers receive trainings and education primarily for chemical agriculture, but by now, the government has initiated training programs on organic agriculture. However, due to financial issues, the number of training programs conducted by the government was inadequate. NGOs such as the World Vision, Care International, and Sarvodaya conduct training programs and workshops related to organic farming in these districts periodically. Furthermore, private agrochemical companies such as Emerald Trading Pvt. Ltd. and CIC Company conduct programs on organic agriculture as CSR activities, while some extension officers interested in organic farming gain knowledge on organic farming by self-study using the internet, magazines, books, and newspapers.

According to the findings of Asadi, Akbari, Sharifzadeh, & Hashemi, (2009), 90.6 % of extension officers' knowledge related to the non-organic agriculture was at "intermediate or higher levels," and 9.3% rated their chemical farming knowledge level as "below intermediate level." While only 28.6 % extension officers had knowledge related to organic farming at intermediate or higher levels, 71.4 % of the extension officers had knowledge below the intermediate level.

Sources of Information on the Agricultural Extension Officers

Finding information on important sources of organic agriculture is a critical current need. Therefore, information sources on organic agriculture available for the extension officers were studied, and the relevant information presented in Table 5.

Table 5. Information sources used by agricultural extension officers (n=120)

Information source	Badulla district		Rathnapura district	
	Frequency	Percentage	Frequency	Percentage
Training & education programs of government organizations	27	45.0	27	46.6
Training & education programs of other organizations (Ex. NGOs, Private org.)	29	48.3	28	45.0
Magazines	25	41.6	24	40.0
Newspapers	24	40.0	26	43.3
Books	22	36.6	24	40.0
Radio	21	35.0	23	38.3

Television	14	23.3	15	25.0
Internet	10	16.6	11	18.3
Facebook	05	08.3	08	13.3

According to Table 5, the first three sources on Badulla district were training & education programs of other organizations, training & education programs of the government, and the magazines. Also, the most common three sources of information in the Rathnapura district were training & education programs of the government, training & education programs of other organizations, and books. Badulla district is a difficult region than the Rathnapura district, and hence, several NGOs are operating in the region. Some private companies are also working with farmers, and a famous environmentalist Mr. Thilak Kandegama is promoting organic agriculture in this area. Rathnapura is comparatively less remote than the Badulla district, with the operation of a significant level of government agricultural extension service. The use of printed materials such as magazines, books, and newspapers was higher in both districts than the use of electronic sources like television and the internet. In Sri Lanka, internet facilities are still not available in some rural areas. Alotaib, Yoder, Brennan, & Kassem, (2019), have reported that similar sources of information are used by the agricultural extension agents in Saudi Arabia for training on organic agriculture. According to the findings of Adjabui, (2018), training programs for the extension officers is vital to improve their knowledge about the adoption and dissemination of information on agriculture-related operations.

Agricultural Extension Officers' attitude towards Organic Agriculture

The attitude of agriculture extension officers in both districts was measured using 20 attitudinal statements considering five critical aspects of organic agriculture as "knowledge-related factors," "environment protecting factors," "health-related factors," "marketing-related factors," and "social-related factors." All results are presented in Table 6.

Table 6. The attitude of agricultural extension officers towards organic agriculture in Badulla, Rathnapura, and both districts

No.	Statement	Badulla			Rathnapura			Both Districts		
		M V	**S D**	**O A**	**M V**	**S D**	**O A**	**M V**	**S D**	**O A**
Organic farming knowledge										
01	Organic farming is simple than conventional farming	3.27	1.22	A	3.18	1.20	U	3.28	1.21	U
02	Organic farming requires quality seeds	4.13	1.08	A	4.15	1.04	A	4.14	1.06	A
03	No use of chemical pesticides and weedicides in organic farming	3.95	1.13	A	3.90	1.15	A	3.93	1.13	A
04	Organic farming provides solutions for local problems	3.97	0.82	A	3.98	0.81	A	3.98	0.81	A
	Overall mean ()	**3.83**		**A**	**3.80**		**A**	**3.83**		**A**
Environment factors										
05	Organic farming uses organic fertilizer	4.17	0.99	A	4.18	1.05	A	4.18	1.02	A
06	Organic farming protects natural resources	4.42	0.79	A	4.47	0.79	A	4.45	0.79	A

07	Organic farming improves soil condition	3.83	1.07	A	3.78	1.14	A	3.81	1.10	A
	Overall mean ()	**4.14**		**A**	**4.14**		**A**	**4.15**		**A**
Health factors										
08	Organic farming does not generate health hazards to people	4.35	0.95	A	4.30	1.05	A	4.33	0.10	A
09	Organic food can enhance human health	3.88	0.80	A	3.95	0.77	A	3.92	0.78	A
10	Organic food act as medicine for some diseases	3.43	1.10	U	3.40	1.11	U	3.42	1.10	U
	Overall mean ()	**3.88**		**A**	**3.88**		**A**	**3.89**		**A**
Marketing factors										
11	Consumers prefer to buy organic food rather than inorganically produced food	4.43	0.70	A	4.47	0.70	A	4.45	0.70	A
12	Selling organic food is easier than selling conventional food	3.17	1.12	U	3.47	1.14	U	3.46	1.13	U
13	The government provides many facilities to market organic food	3.17	1.11	U	3.10	1.15	U	3.13	1.12	U
14	COP for organic food production is lower than the conventional food production	2.58	0.94	U	2.55	0.91	U	2.57	0.92	U
15	Organic farming is more profitable than conventional farming	3.45	1.14	U	3.47	1.13	U	3.46	1.13	U
16	Farmers can reduce fertilizer cost through the production of their own organic fertilizer	4.25	0.86	A	4.18	0.95	A	4.22	0.90	A
	Overall mean ()	**3.51**		**A**	**3.54**		**A**	**3.55**		**A**
Social factors										
17	Development of organic farming requires support from government and NGO's	4.23	0.81	A	4.25	0.70	A	4.24	0.76	A
18	To develop organic farming, it requires to formulate policies by the government	4.28	0.87	A	4.23	0.89	A	4.26	0.87	A
19	Organic farming causes use and exchange of local resources	4.36	0.75	A	4.05	0.75	A	4.21	0.74	A
20	Organic farming generates employment opportunities in rural areas	4.18	0.83	A	4.05	0.83	A	4.21	0.83	A
	Overall mean ()	**4.26**		**A**	**4.15**		**A**	**4.23**		**A**
	Grand mean ()	**3.92**		**A**	**3.90**		**A**	**3.93**		**A**

Note: MV= Mean Value, SD = Standard Deviation, OA= Overall Attitude

Cut off levels: 1.00-1.49 = strongly disagree; 1.50-2.49 = disagree; 2.50-3.49 = undecided; 3.50-4.49 = agree and 4.50-5.00 = strongly agree

As per Table 6, except for six statements, agricultural extension officers in both districts had positive attitude for the other 14 statements. As all agricultural extension officers had a general knowledge of organic agriculture, they could understand the basics of organic agriculture, such as environmental benefits and health and social benefits, but had limited knowledge on marketing and policy-related matters on organic agriculture. However, their overall attitude towards organic agriculture is positive. This situation was somewhat similar to the findings of Tiraieyari, Hamzah, Samah, & Uli, (2013), who reported that extension workers' have "favorable" perceptions and knowledge on organic with sustainable agriculture practices. According to the findings of Haris, (2019), environmental protection factors-related attitude was the most influential factor for information sharing attitude regarding organic farming in Malaysia.

Shiri, Faghiri, Pirmoradi , & Agahi, (2014) have tested the attitude of agricultural extension workers towards organic farming in Iran and analyzed the approach of agricultural extension workers towards organic agriculture in a similar way using 20 attitudinal statements with a five-point Likert scale. However, according to their findings, extension workers have not proclaimed a favorable attitude towards organic agriculture.

Factors affecting the Agricultural Extension Officers' attitude towards Organic Agriculture

Most extension officers have a positive attitude towards organic agriculture. Thus, a binary logistic regression was run to find out the relationships between the attitude of agriculture extension officers and their profile factors: age, gender, level of education, service period, and participated training programs. The joint impact of all predictor variables on the dependent variable was also analyzed by using the concept of Nagelkerke R^2, which is explained in the model summary Table 7. It describes the amount of variation in the dependent variable that could be explained by the model.

Table 7. Model summary of binary logistic regression analysis

Step 1	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	112.595[a]	.199	.289

As per Table 7, the model summary provides some approximation of R^2 statistics in logistic regression. The most common assessment of the overall model fit in logistic regression is the likelihood ratio test, which was simply the *chi-square* difference between the null model (with the constant) and the model containing the predictors. Under the model summary of this analysis, the -2 Log-Likelihood statistics is 112.595, which was suitable for the model. This statistic measures how the model predicts the agriculture extension officers' attitude in positive status. The result of Cox and Snell R^2 indicates that the predictor variable explains 19.9 % of the variation in the dependent variable.

Table 8. Goodness-of-fit (Model diagnostic); Hosmer and Lemeshow test

Step 1	Chi-square	df	Sig.
1	7.349	8	.499

As observed from Table 8, the *p-value* 0.499 is greater than the level of significance at 5 %, allowing concluding that the data fit the model perfectly. Since the *p-value* is 0.499, which was insignificant, the fitted logistic regression model is a good fit.

Information provided in the "variables in the equation" in Table 2 helped to observe the probability of an event occurring based on a one-unit change in an independent variable when all other independent variables are kept constant, as shown in Table 9.

Table 9. Variables in the equation

Variable	B	S.E.	Wald	df	Sig.	Exp (B)	95% C.I. for EXP(B)	
							Lower	Upper
Step 1[a] Gender (1)	.489	.574	.725	1	.394	1.631	.529	5.024
Age	.060	.046	1.679	1	.195	1.061	.970	1.162
Marital status (1)	.862	.677	1.621	1	.203	2.367	.628	8.915
Education level (1)	.045	.774	.003	1	.954	1.046	.229	4.771
Service period	.062	.044	1.973	1	.160	1.064	.976	1.160
Other trainings	1.600	1.458	1.205	1	.272	4.952	.285	86.182
Trainings on OA (1)	1.340	.510	6.908	1	**.009**	**3.820**	1.406	10.378
Constant	-5.086	2.497	4.149	1	.042	.006		

In Table 9, trainings on OA (organic agriculture) was a significant factor because the *p-value* (0.009) is lower than 0.05 at the 95 % confidence level. Estimated odds ratio 3.820 (Exp. B) indicates that officers who participated in trainings on organic agriculture are 3.820 times more likely to have a positive attitude towards organic agriculture compared to the officers who had not participated in training programs on organic agriculture, controlling other variables in the model. Moreover, as per Table 9, no relationship was observed between the other variables, such as age, gender, marital status, education level, service period, and the number of trainings on general agriculture.

However, a significant relationship occurred between the positive attitude of agriculture extension officers and the number of trainings received on organic agriculture. This was a more or less similar situation with the previous study conducted by Gracia & de Magistris, (2007). They have used the same method of analysis and revealed that education was a significant factor affecting attitude towards organic agriculture. Moreover, Wheeler, (2008) found that professionals with more knowledge and experience in organic agriculture were more likely to have a favorable attitude towards organic agriculture. However, Tiraieyari, Hamzah, Samah, & Uli, (2013) have reported an opposite finding, which explained that the level of education and working experience of extension workers in Malaysia did not affect their attitude towards the dimensions of sustainable agricultural practices.

Conclusions

The results lead to making several conclusions. As per the profile of the agricultural extension officers, more than half of the respondents are married males in the age category of 37-55 years. Most of them are diploma holders, and many officers have 11-20 years of service period in their field. While most have participated in 1-5 training programs on general agriculture, majority of them have participated in 1-5 training programs on organic agriculture.

Most agricultural extension officers have general knowledge, but about one-fifth of the respondents have excellent knowledge on organic farming. Some extension officers were highly interested and were prepared to learn about organic agriculture and conduct research activities.

When sources of information are concerned, in both districts, majority of agricultural extension officers obtain information from training programs conducted by the government and from other organizations. Reading newspapers, books, and magazines are also popular methods to receive information. Therefore, the government should conduct more training programs and workshops related to organic agriculture. Also, a considerable number of officers use television, radio, and the internet to receive the latest information related to organic agriculture.

Regarding the attitude, agricultural extension officers have a positive attitude towards organic agriculture. As most of them have general knowledge of organic agriculture through several sources, they have an understanding of the potential benefits of organic agriculture, such as environmental protection, health-enhancement, and social development aspects of organic agriculture. This is a very good situation. As per the United Nations Sustainable Development Goals, extension officers can contribute to a greater extent to reach sustainable development by the year 2030 in Sri Lanka. However, yet they have no clear understanding of marketing-related aspects such as market demand, pricing, and profit earning ability of organic products.

Analyzing the factors affecting the attitude towards organic agriculture, a significant relationship was found between their attitude and training received for organic agriculture. When extension officers participate in training programs, they learn most of the important aspects of organic agriculture and related benefits. If agricultural extension officers are provided with the knowledge, trainings, and new technologies related to organic agriculture, they can be motivated towards organic agriculture that helps to educate and train farmers for an environmental-friendly farming system, thereby leading Sri Lanka into sustainable development.

Recommendations

The present study findings revealed that a small number of extension officers have good knowledge of organic agriculture. Therefore, conducting appropriate training programs for extension officers is a timely requisite, and including marketing-related information into these training programs is a must.

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