A Survey Study on Mushroom Cultivation Knowledge of Participant's at Kapasia in Gazipur, Bangladesh

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Received: 05/02/2020 Accepted: 23/03/2020

Abstract

The survey was carried out to determine the knowledge of mushroom cultivation by the farmers. The study was conducted at five villages of Kapasia Gazipur in Bangladesh. Data was collected randomly from 97 selected trained farmers from list of 972 farmers of the study area that was done through personal contact by interview schedule during the period from 01 to 30 June 2019. The study revealed that the highest 60.82% of the respondents had medium knowledge on mushroom cultivation, while 27.64 percent had low knowledge and the rest 16.50 percent had the highest knowledge on mushroom cultivation. The correlation analysis indicated that education, belief about the mushroom, neighborhood influence, length of training, organizational participation and adoption of mushroom cultivation of the farmers. Age, family size and extension contact had no significant relationships with their knowledge of mushroom cultivation.

Key words: Mushroom cultivation, Trained farmers, Bangladesh.

Introduction:

Mushroom is the most important item in Bangladesh. It is the most associated with horticulture issues and is a soft delicate white fruit-body of the fleshy fungi (Aida *et al.*, 2013). The real fungus is the microscopic fine thread-like body called mycelium, which grows on the substratum or under the surface of the soil. At maturity, the mycelia come together in a very compact form and sprout and spread as an umbrella-like structure (Bruhn, 1995). Nowadays mushroom is a popular vegetable in our country. The nutritional and medicinal values of Mushrooms have long been recognized (Suman and Sharma, 2007). Edible mushrooms are a good source of protein, vitamins, and minerals (Asemota *et al*., 2015). As a group, mushrooms also contain some unsaturated fatty acids; they provide several types of B vitamins, and vitamin D (Aida *et al*., 2013). They also contain a significant amount of vitamin C, as well as minerals, potassium, phosphorus, calcium and magnesium (Bruhn, 1995). Lintzedl (2001) mentioned that 100 to 200 gm (dry wt.) of mushroom was required to maintain nutritional balance in a normal human body weighing 70 kg. Now, mushrooms are being cultivated in more than 100 countries of the world, with an estimated total production of over 12 million tons (Suman and Sharma, 2007). This increased production that was due to increased production efficiency and increasing consumer demand. During the past few decades, the demand has been increased due to

the easy preparation of food items. In recent times, however, mushrooms have assumed greater importance in the diets of both rural and urban dwellers (Bruhn 1995).

In Bangladesh, mushroom cultivation is begun in 1979 with assistance of Japan. Applications and market for mushrooms are growing rapidly in Bangladesh. Mushroom cultivation is started first at Horticulture Centre, 'Sobhanbag', Savar, Dhaka, Bangladesh. In the meantime, the present government takes many initiatives to develop mushroom cultivars. The trained farmers understand that by mushroom cultivation, it is possible to alleviate poverty and create employment opportunities for youths, adolescents and women. Now, farmers living nearby sub-centers received training on mushroom cultivation and practicing its cultivation. But in a rural area, most of the farmers do not know properly the process of mushroom cultivation. Importantly farmers want to adopt mushroom cultivation side by other agricultural products as a source of income. But their knowledge is not sufficient about mushroom cultivation. With this view in mind, the experiment was conducted to identify the farmer's knowledge of mushroom cultivation with the following objectives: (i). to determine and describe selected characteristics of mushroom trained farmers, (ii). to identify the extent of mushroom cultivation knowledge by the farmers and (iii). to explore the relationships between the mushroom cultivation knowledge of the farmers and their selected characteristics.

Materials and Methods:

Study area:

Kapasia Upazila (Gazipur district) area 356.98 sq km, located in between 24°02' and 24°16' north latitudes and in between 90°30' and 90°42' east longitudes. It is bounded by Gaffargaon and Pakundia Upazilas on the north, Kaliganj, Shibpur and Palash Upazilas on the south, Monohardi Upazila on the east and Sreepur Upazila on the west.

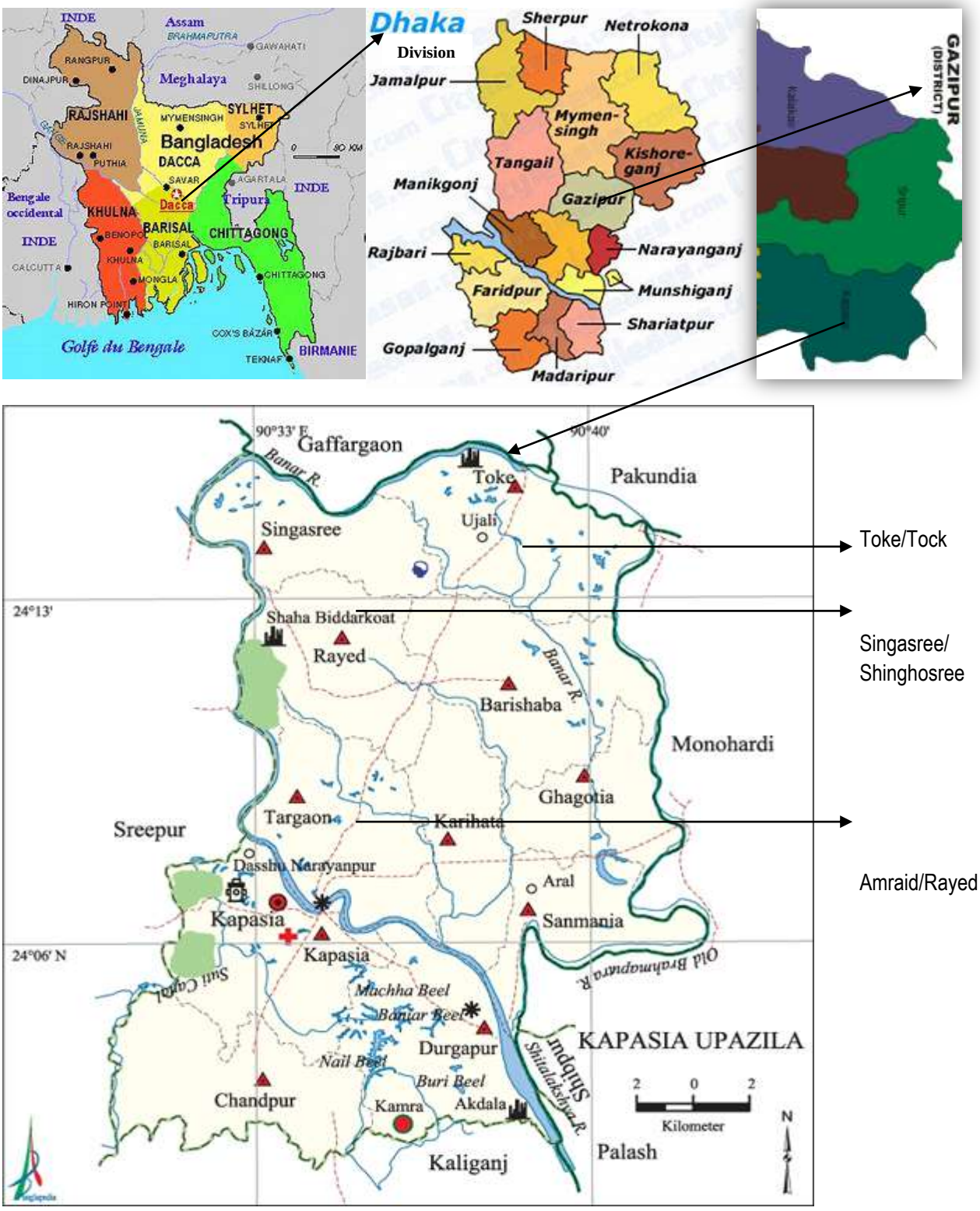

Fig 1. The five villages that were selected randomly named Namila, Kapalashore, Amraid, Tock, and Shinghosree (main three village's name indicated).

A survey study was carried out at 'Kapasia' Upazila during the period from 01 to 30 June 2019 under Gazipur Sadar district in Dhaka, Bangladesh. A total of 972 farmers have received training on mushroom cultivation from fourteen villages in Kapasia Upazila. Out of fourteen villages, five villages named 'Namila', 'Kapalashore', 'Amraid', 'Tock', and 'Shinghosree' of 'Kapasia' Upazila were selected randomly from the location of the study. All trained mushroom farmers of five villages constituted the population of the study. Ten percent of farmers had selected using the proportionately random sampling method. Thus, finally, 97 mushroom farmers were selected constituted the sample size for the study. A reserve list of 10 respondents was also prepared for covering the positions in case of the absence of the selected respondents during the interview. The distribution of the population and the sample size has been presented in Figure 2.

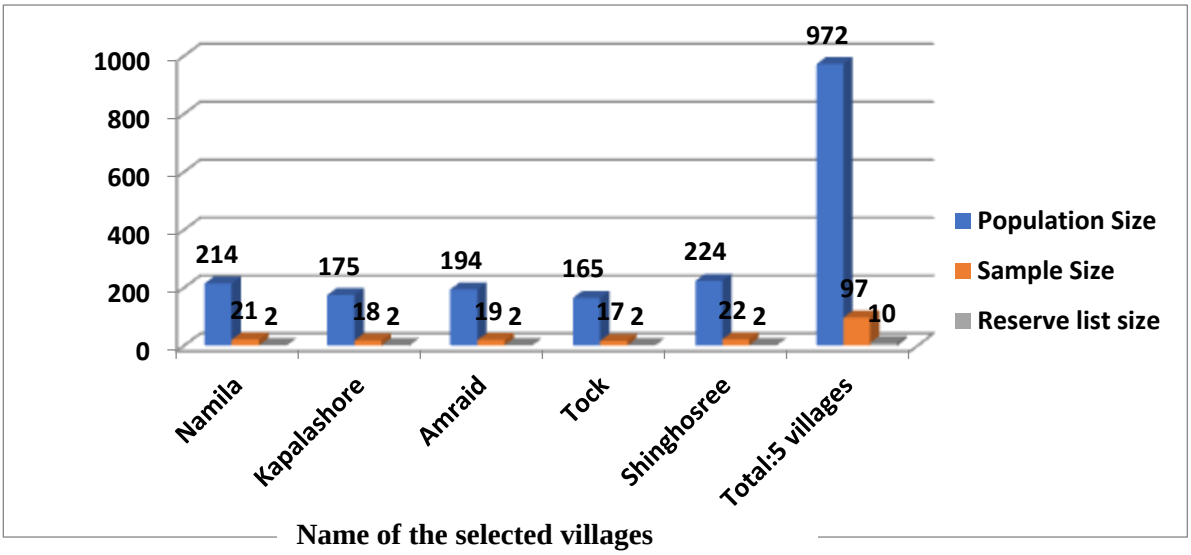

Fig. 2. Distribution of the population, sample, and number of trained farmers in the reserve list

Age, education, family size, belief about the mushroom, neighborhood influence, length of training, cosmospoliteness, extension contact, organizational participation and adoption of mushroom cultivation were the selected characteristics of the study, where knowledge on mushroom cultivation was the main. The age of a farmer referred to the period of time from his/her birth to the time of the interview and was measured in terms of actual years on the basis of his/her statement. One score was assigned for each year of his/her age. The educational level of the respondent farmers was measured on the basis of completed years of schooling and score was assigned for each completed year of schooling. The family size of a mushroom farmer was measured on the basis of the total number of family members and assigned score one for each member of the family. Belief is the prerequisite for the adoption of an innovation. The belief score of a mushroom farmer was computed by summing up the scores for his/her responses to all the items. The neighborhood influence of a respondent was measured by asking ten statements about their neighbors. The score was assigned on the basis of the extent of influence on the respondents. The length of training of a respondent was measured on the basis of the number of days of training received on mushroom cultivation from different sources. The score of a respondent was measured in terms of the number of days for receiving training. Cosmos politeness of a respondent was measured in terms of his/her nature of visits to the seven different places external to his/her own social system and scale used for computing the cosmospoliteness. Extension media contact

was measured on the basis of a respondent's extent of exposure information from related agricultural sources. Weight was assigned for all extension media. The organizational participation score was computed for each respondent on the basis of his/her membership with four different types of organizations. The adoption of mushroom cultivation was measured by multiplying two sub-scores. The score was based on two dimensions, viz., the number of spawn cultivation by an individual and the mushroom cultivation experience of that trained farmer who has adopted. Two sub-scores, namely the number of spawn sub-score and experience sub-score were computed for the aforementioned dimensions. Procedures followed in computing the two sub-scores have been presented below:

Number of spawn sub-score and experience sub-score

The number of spawn sub-score was determined on the basis of the number of spawn packets that have been used of his/her total cultivation period for adoption of mushroom cultivation. Mushroom cultivation experience sub-score was computed on the basis of the years during which an individual experienced in mushroom cultivation in the study area. Scoring was made as shown in Table (1):

Table 1. Number of spawn packets with scoring and years of mushroom cultivation

Spawn packets used for the adoption of mushroom cultivation	Years of mushroom cultivation	Sub-score
25-50 spawn packets	Below 1 year	1
51-75 spawn packets	1-2 years	2
76-100 spawn packets	3-4 years	3
Above 100 spawn packets	Above 4 years	4

The possible number of spawn sub-scores and experience scores of the farmers could vary from a minimum of 1 to a maximum of 4. It was assumed that the higher the number of spawn and the experience sub-score, the higher will be the adoption. Therefore, the adoption score was computed by multiplying the number of spawn sub-score and mushroom cultivation experience sub-score. Thus, the obtained score could range from 1 to 16. The score one (1) indicated the lowest adoption and 16 indicated the highest adoption of mushroom cultivation. It was finally assumed, that the higher the adoption score, the greater will be the overall adoption of mushroom cultivation.

Mushroom cultivation knowledge of a respondent was measured by asking him/her 15 questions related to different aspects of mushroom cultivation. It was measured by asking the question. The total assigned scores for all the questions were 75. The score was given according to the response at the time of the interview. Answering a question correctly an individual could obtain a full score. While for the wrong answer or no answer he obtained zero scores. The partial score was assigned for a partially correct answer. Where Coefficient Correlation analysis has been followed with excel program.

Results and Discussion:

Mushroom cultivation knowledge scores of the respondents ranged from 18 to 62 against the possible score from 0 to 75 with a mean and standard deviation of 37.09 and 10.87 respectively. On the basis of their mushroom cultivation knowledge score, the farmers were classified into three categories, viz., low knowledge, medium knowledge and high knowledge. The distribution of the farmers according to the mushroom cultivation knowledge categories has been presented in Table (2). These findings are supported by Asemota *et al*. (2015) where mentioned that mushroom prevents malnutrition, reduce micronutrient deficiencies and improve household food security especially in the rural areas of the developing countries and is increasing with the search for alternative foods to improve household

nutrients requirements. The level of the participants and the utilization of mushroom as a food supplement in six Local Government Areas of Cross River State. Adequate food intake is essential for nutritional wellbeing and plays a role in preventing morbidity and mortality (Klupp *et al*., 2015).

Table 2. Distribution of the farmers according to their mushroom cultivation knowledge

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Low knowledge (≤ 26)	22	22.68	37.09	10.87
Medium knowledge (27-48)	59	60.82		
High knowledge (> 48)	16	16.50		
Total	**97**	**100**		

Data in Table (2) reveals that the farmers having medium knowledge in mushroom cultivation constituted the highest proportion (60.82 percent) followed by low knowledge in mushroom cultivation (22.68 percent) and high knowledge in mushroom cultivation (16.50 percent). Table (2) shows an overwhelming majority (83.50 percent) of the farmers had low to medium knowledge in mushroom cultivation. Low knowledge causes low adoption of mushroom cultivation. The first factor of any innovation is the knowledge gap. The farmers may not understand some of the procedure which they taught during the training. Without a clear understanding of different steps may make farmers unable to commence on mushroom farming. Aida *et al*., (2013) mentioned that increase awareness about the role of micronutrients in health and disease as well as knowledge. Knowledge level and cultivation are developed by training activities on mushroom farming. As a result, rural development is occurred day by day.

Data contained in Table (3) reveals that a large portion of the respondents (62.98%) had young aged, and most of them literate, but their knowledge level was low (22.68%) to medium (60.82%). In this study the majority of the respondents have low to medium training. Almost all the respondents (91.80) have low to medium cosmos politeness. About nineteenth (86.50%) respondents have low to medium contact with extension media. It also indicates that about one-half of the respondents have no organizational participation (57.73%).

Table 3. Salient features of different selected characteristics of mushroom farmers

Characteristics	Observed range	Possible range	Categories	Respondents		Mean	Standard Deviation
				Number	%		
Age	17-58	Unknown	Young aged (below 35 years)	61	62.98	33.00	9.11
			Middle-aged(35-50 years)	31	31.96		
			Old aged(above 50 years)	5	5.15		
Education	0-16	Unknown	Illiterate(0)	13	13.14	4.01	4.76
			Can sign only(0.5)	25	25.77		
			Primary education(1-5)	29	29.77		
			Secondary education(6-10)	19	19.59		
			Above secondary education(above 10)	11	11.34		
Family size	2-9	Unknown	Small family size (<4nos.)	68	70.10	3.98	1.87
			Medium family size(5-7nos)	22	22.68		
			Large family size (above 7 nos.)	7	7.22		
Belief about mushroom	6-8	6-24	Low belief (<6)	42	43.30	8.42	2.988
			Medium belief(7-12)	46	47.42		
			High belief(>12)	9	7.22		
Neighborhood influence	13-36	10-40	Low influence(<20)	49	50.51	21.01	1.04
			Medium influence(21-30)	41	42.27		
			High influence(>30)	7	7.22		
Length of training	1-4	Unknown	Low length training(<1)	26	26.80	2.28	5.65
			Medium length training(2-3)	55	56.70		
			High length training(>3)	16	16.50		
Cosmos-politeness	5-17	0-28	Low(<9)	25	25.80	11.03	3.00
			Medium(10-13)	64	66.00		
			High(>4)	8	8.20		
Extension media contact	8-25	0-28	Low contact(<13)	20	20.62	16.69	3.90
			Medium contact(14-20)	64	65.98		
			High contact(>20)	13	13.40		
Organizational participation	0-8	0-52	No participation(<0)	56	57.73	1.36	1.99
			Low participation(1-5)	34	35.05		
			Medium participation(>5)	7	7.22		
Adoption of mushroom cultivation	1-6	18-62	Low adoption(<3)	59	60.82	4.01	3.60
			Medium adoption(4-8)	27	27.84		
			High adoption(>9)	11	11.34		

About one-ninth of the population have low to medium adoption on mushroom cultivation, where Klupp *et al*., (2015); and Kozarski *et al*., (2015) supported these findings. Mushrooms studies have shown an association of mushrooms with good health and are widely consumed for consistency of the health and potential substitute for meat (Aida *et al.*, 2013). The summary of the results of correlation analysis has been presented in Table (4) showing the relationship between selected characteristics of

mushroom farmers and the knowledge on mushroom cultivation. Most of the respondents have low to medium training. Caglarirmak, (2011) had been found that knowledge on mushroom rapidly grown to the mushroom farmers and participants mentioned that sometimes the use of mushrooms as flavors and substitutes of vitamins.

Table 4. Pearson's product-moment coefficient of correlation showing the relationship between adoption of mushroom cultivation and their selected characteristics (N = 97)

Dependent variable	Independent variables	Value of co-efficient of correlation (r)	Tabulated value at 95 df	
			0.05 level	0.01 level
Knowledge on mushroom cultivation	Age	-0.052NS	0.191	0.249
	Education	0.374**		
	Family size	0.092NS		
	Belief about mushroom	0.348**		
	Neighborhoods influence	0.389**		
	Length of training	0.240**		
	Cosmo politeness	-0.001 NS		
	Extension media contact	0.61NS		
	Organizational participation	0.218*		
	Adoption on mushroom cultivation	0.504**		

Data contained in Table (4) revealed that age and cosmosposliteness had a non-significant negative relationship with farmer's knowledge on mushroom cultivation. Cosmospoliteness and age of mushroom cultivar had a negatively non-significant relationship with the knowledge of mushroom cultivation. Education, belief about the mushroom, neighborhood influence, length of training and adoption on mushroom cultivation had a highly significant relationship with knowledge on mushroom cultivation. Organizational participation also had a positive relationship with knowledge on mushroom cultivation at 0.05 level of significance. Extension media contact and family size had a non-significant relationship with knowledge on mushroom cultivation. Cheah *et al.,* (2016) supported these types of activities. This finding agrees with the observation made by other researchers who also observed that women are the principal mushroom collectors in many parts of the world, and playing a central role in mushroom processing both for self-consumption and sale.

It has been deeply observed that many functions are supported by the high knowledge report of the participants in these findings. It thus shows that women surely have a vast knowledge of mushroom folk taxonomy, edibility, biology, as well as ecological niches as mentioned by Tibuhw, (2013). Although, Mgbekem *et al.,* (2019) revealed that most of the participants had good knowledge as they could relate mushrooms with some health benefits based on what they learned from parents, friends, and studies and could utilize the mushrooms based activities and it was observed that knowledge was not in-depth enough in passed. Nowadays, the mushroom is used as a food supplement and health security.

Conclusions:

On the basis of findings and their interpretation, it was found that authority should be concern about mushroom cultivars, because of the major portion (88.66 percent) of the trained farmers had low to medium adoption in the study area. So there is a need to increase the rate of adoption as well as knowledge on mushroom cultivation by the trained farmers. In the study there existed a positively

highly significant relationship between farmers' education and their knowledge of mushroom cultivation. Therefore, it may be concluded that only educated farmers had positive knowledge of mushroom cultivation. Belief about the mushroom, neighborhood influence, length of training and adoption on mushroom cultivation had also a positive significant relationship with farmer's knowledge on mushroom cultivation. There is a necessity to educate and motivate less educated farmers by the concerned authority. So if authority should be concern about mushroom cultivars then farmers' knowledge, their belief, norms, as well as their attitude, will be an increase in mushroom cultivation. For these reasons, the farmer becomes positive to take training and increase their knowledge of mushroom cultivation.

Recommendations:

The findings of this study suggest that **(i).** Edible mushrooms provided a good supplement to the diet in the form of proteins, carbohydrates, valuable salts and vitamins. **(ii).** Cultivation of mushroom had opened a new opportunity of earning extra income for a good number of small, marginal and landless families. **(iii).** The greatest advantage for small, landless and marginal farmers is that mushroom cultivation did not need any land. It could be grown at the homestead or inside a house. **(iv).** Poor women can have extra income from cultivating mushrooms. Older and disabled people can also cultivate mushrooms in their homesteads. **(v).** Lots of training should be arranged for mushroom cultivation in different parts of the country like Union and Upazila level.

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دراسة لحصر المعرفة والإلمام بزراعة الفطر في كاباسيا التابعة لغازي بور ببنغلادش

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تاريخ الاستلام: 2020/02/05 تاريخ القبول: 2020/03/23

الملخص

نفذ الحصر من أجل معرفة مدى إلمام المزارعين بزراعة الفطر، وذلك في خمسة قرى في كاباسيا، التابعة لغازي بور في بنغلادش. تم جمع البيانات من 97 مزارعاً بصورة عشوائية من أصل 972 قد تم تدريبهم على زراعة الفطر في منطقة الدراسة، وذلك عن طريق المقابلة الشخصية والاتصال خلال الفترة من 1 وحتى 30 حزيران من العام 2019. أظهرت نتائج الدراسة بأن 60.82% من المبحوثين كانوا على إلمام بدرجة متوسطة بزراعة الفطر، وبالمقابل كانت نسبة المبحوثين الذين كانت معرفتهم ضعيفة بزراعة الفطر 27.74%، في كانت النسبة المتبقية لمن كانت معرفتهم جيدة وبلغت 16.50%. أظهر تحليل الارتباط وجود ارتباط إيجابي ومعنوي بين مستوى التعليم، والقناعة بأهمية الفطر، وتأثير الجار، وطول فترة التدريب، ومشاركة المنظمات مع تبني المزارع لزراعة الفطر. وبالمقابل لم يكن لكل من العمر، وحجم الأسرة، والاتصال مع الإرشاد أي تأثير معنوي في معرفتهم بزراعة الفطر.

الكلمات المفتاحية : زراعة الفطر، تدريب المزارعين، بنغلادش.