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Mushroom Cultivation: A Friendly Profession for Rural and Economic Development in Eastern Bihar

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ABSTRACT

Mushroom cultivation might be considered as an alternative source of income uplifting the living standards of rural family and to add good quality protein in their daily diets helping hand in malnutrition abolition. Training was imparted during the year 2011-12 to 2014-15 by the Department of Plant Pathology, Bihar Agricultural College, (BAU), Sabour, Bihar. After each training programme data of number of mushroom units established and adoption rate of mushroom cultivation were collected from the trainees. According to this data 26, 55, 81 and 114 mushroom units were established with adoption rate, 18.47, 21.73, 28.39 and 23.69 per cent during the year 2011-12, 2012-13, 2013-14 and 2014-15, respectively. Similarly 26, 34, 50 and 34 per cent rise in the perception level regarding mushroom edibility, mushroom consumption, mushroom cultivation and profitability was observed in every consecutive year. The data also revealed that 29, 25, 17, 16 and 13 per cent cultivator managed additional income of 6-8, 9-12, 2-5, 12-15 and 16-20 per cent. As far as motive of farmers before the adoption of the unit are concerned the 25 per cent farmers were of opinion to take loan from Bank, followed by 23 per cent farmers to take advantage of running government scheme, 21 per cent farmers to meet their future need and of 13 per cent to become financially independent.

Keywords: Mushroom cultivation, rural development, rural workers, Eastern Bihar

INTRODUCTION

Agriculture is the back-bone of Bihar's economy as 81 per cent of population of Bihar are dependent on agriculture and it contributes 42 per cent in the State Domestic Product. The state became self-sufficient in food grain production due to huge investment in agricultural research and development during the initial plans. With a view to maximize farm-income and self-employment, special emphasis has been given to develop various agro-based enterprises like dairy, poultry, sheep and goat rearing, fish farming, tissue culture, bio fertilizer, bio pesticides, sericulture, lac cultivation, beekeeping and mushroom cultivation. Mushrooms Cultivation is one of the most economically viable processes for the bioconversion of lingo-cellulosic wastes (Bano *et al,* 1979; Biswas *et al,* 1997; Cohen *et al,* 2002). Mushroom cultivation is being an indoor cultivation, low costing, labour intensive, high profit venture and suitable for rural areas as it can provide employment to small farmers, landless labourers, women, unemployed youth and even retired or in-service personnel in rural areas to a an extent (Das, 2015). Mushroom cultivation helps to improve the socio-economic condition of farmer and generate employment to both literate and illiterate, especially to women. It can also be proved as a very successful tool for rural development (Biswas, 2015). Commercial cultivation of mushroom might proved as a step to meet nutritional and medicinal needs, to reduce malnutrition and to upgrade livelihood status of rural poor. Mushrooms contain 20-30 per cent digestible crude protein and have been recognized as the alternate source of good quality protein than vegetables and fruits. (Banik and Nandi, 2004; Gregori *et al.,* 2007).

Keeping the above mentioned fact in view, the present investigation was planned to ascertain how far the village workers are receptive to adopt this cultivation and to what extent it may be helpful in the generation of employment and what needs to be done in future to strengthen the programme as effective agents for transfer of technology after organizing training programme at Bihar Agricultural University, Sabour.

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METHODOLOGY

The present study was conducted after math the Vocational training on "Mushroom cultivation for self employment" for 3 to 5 days at the Department at mushroom production unit, Department of Plant Pathology, BAU, Sabour for the farmers of different district from eastern Region of Bihar during four consecutive years (2011-12 to 2014-15). The details pertaining to number of training and trainees is mentioned in table 1a. To observe the homogenous impact of training programme forms of different 28 blocks of six districts viz., Bhagalpur (Sultanganj, Shahkund, Jagdishpur, Kharik, Naugachhiya, Pirpainti, Sabour and Nathnagar Blocks), Banka (Rajoun, Dhoraiya, Banka, Katoriya and Baunsi Blocks), Munger (Munger, Bhariarpur, Tarapur and Tetiyabambar Blocks), Lakhisarai (Ramgarh and Halsi Blocks), Jamui (Sikandra, Barhat, Jhajha, Khaira and Chakai Blocks) and Shekhopur (Shekhopursarai, Barbigha, Chewara, and Ariari Blocks) had been selected as mentioned in Figure1.

Four hundred farmers and unemployed youth participated this programme the participants/trainees and they were trained with various aspects of cultivation techniques of different tropical edible mushroom *i.e., Pleurotus* spp. (dhingree mushroom), *Volvariella volvacea* (paddy straw mushroom) and *Calocybe indica* (milky mushroom), preparation of spawn, substrates preparation, Health/Medicinal benefits of the mushroom marketing of fresh product, preservation, *etc.*

Apart from the vocational training, one day training programme was also conducted at frequent intervals and frequent visit was made at their newly established mushroom unit to upgrade their skills, to overcome their shortcomings and to motivate them. The feedback was taken from the famers after a month of establishment of mushroom unit in the concerned area. Personal interaction among the trainees was also taken into the account for the feedback/study purpose. The data/feedback pertaining to adoption rate of mushroom cultivation, change in perception and knowledge level, income of the mushroom cultivation enterprise in proportion to family income and people response towards to motive to grow mushroom was collected from trainees.

Changes in perception level

Changes in the perception level towards the mushroom cultivation was assessed by parameters such as increasing numbers of mushroom growers in the block, availability of fresh mushroom in local markets, productivity, per capita consumption of mushroom day-1 and additional increase in monthly income through mushroom cultivation. Appropriate schedule was prepared which was pre-tested for its validity before data collection. Similarly, data was collected randomly regarding acquaintances about edibility of mushroom, mushroom consumption, preliminary knowledge of mushroom cultivation and profitability of mushroom cultivation at before and after training (Table 2).

The data pertaining to increase in family income after adoption of mushroom cultivation was collected randomly from 100 respondents. The increase in family income was categorized into five different levels as shown in table 3. Data regarding farmers' motive to grow mushroom was also obtained from 100 mushroom growers of the villages. and various ways which motivated farmers to cultivate mushrooms are listed in Figure 3.

RESULTS AND DISCUSSION

Numbers of mushroom unit established and average adoption rate among trainees were encouraging. (Table 1a and 1b, Figure 2 and Plate 1 (1a to 1f). Data pertaining to number of mushroom units established and adoption rate of mushroom cultivation were collected from the villagers after each training programme. The data indicated that 26, 55, 81 and 114 mushroom units were established during the year 2011-12, 2012-13, 2013-14 and 2014-15, respectively. The data indicates significant rising trend in the establishment of new mushroom units i.e. 26 (in 2011-12) to 114 (in 2014-15). The adoption rate (per cent) of mushroom cultivation was calculated on the bases of continuous adopters and it was 18.47, 21.73, 28.39 and 23.69 per cent during the year 2011-12, 2012-13, 2013-14 and 2014-15, respectively with overall average of 23.07 per cent (Table 1a and 1b, Figure 2). Arora (2015) conducted to ascertain the impact of vocational training programme on mushroom cultivation for self employment and had shown that the adoption rates increase from 9.83 per cent to 42.30 per cent. Gautam *et al.* (2014) has also studied the adoption rate of mushroom cultivation and shown that 86 per cent of respondents adopted the mushroom production enterprise in the first year, while 14 per cent of respondents did not adopt it in same year.

Table 1a: Training programs organized and adoption rate of mushroom cultivation in Eastern Bihar, 2012-15

Year of training	Number of Trainings	Season of training	Number of participants	Mushroom cultivation unit established	Sample category			Adoption rate (%)
					Continued adopter	Non-adopter	Dis-continued	
2011-12	2	winter	61	19	13	42	6	21.31
	1	summer	32	7	5	25	2	15.63

2012-13	2	winter	57	21	15	36	6	26.32
	1	summer	35	8	6	27	2	17.14
2013-14	2	winter	65	25	18	40	7	27.69
	2	summer	55	21	16	31	5	29.09
2014-15	2	winter	63	27	20	36	7	31.75
	1	summer	32	6	5	26	1	15.63
Total	13	-	400	134	98	263	36	23.07

Table 1b: Training programs organized and adoption rate of mushroom cultivation in Eastern Bihar, 2012-15

Year of training	No. of participants	No. of mushroom units established	Continuous adapters	Adaption rate
2011-12	93	26	18	18.47
2012-13	92	55	39	21.73
2013-14	120	81	73	28.39
2014-15	95	114	98	23.69
Total	400	-	-	23.07

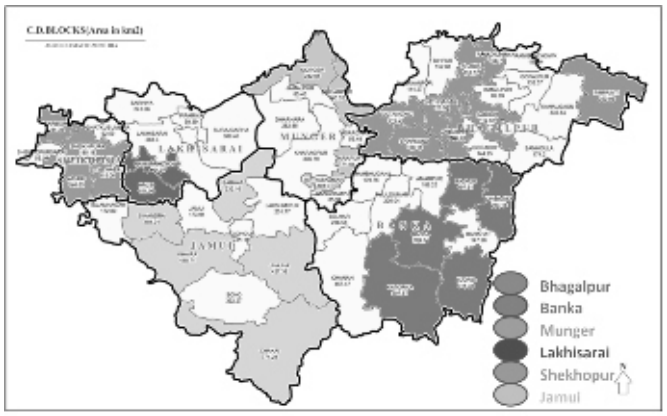

Figure1: Blocks of Eastern Bihar from which trainees were selected for Mushroom training

Changes in perception level

The perception and knowledge level of the respondents before and after the training regarding mushroom and its cultivation is presented in Table 2. The perception or knowledge level among villagers' was increased to 26, 34, 50 and 34 per cent regarding knowledge about mushroom edibility, mushroom consumption, preliminary knowledge of mushroom cultivation and profitability in mushroom cultivation, respectively.

Rural youths and village women were inspired greatly with the easy method of cultivation, and started mushroom cultivation on a small scale and produced on an average (4.5 kg day-1) as an extra income. They also included mushroom in their daily diet and supplemented themselves with additional nutrition. The overall perception and knowledge level of respondents were found to be changed after the training. The knowledge and perception level on mushroom cultivation technology, their food and nutritional values, economics in cultivation, profitability, etc. were also disseminated through channels like literature and FLD to deepen its impact. About 80 per cent of respondents developed their skills in mushroom cultivation while, 34 per cent respondents felt that mushroom cultivation is a profitable business and can be selected as an alternative business for generating extra income. The data pertaining to increase in family income due to adoption of mushroom cultivation was obtained randomly from 100 mushroom growers and the response was categorized into five categories (Table 3).

The data indicated that 29, 25, 17, 16 and 13 per cent of growers obtained an additional income of 6-8, 9-12, 2-5, 12-15 and 16-20 per cent after adoption of mushroom cultivation. The data regarding farmers' motive to grow mushroom was also collected. As far as motive of farmers before the adoption of the unit are concerned the 25 per cent farmers were of opinion to take loan from Bank, followed by 23 per cent farmers to take advantage of running government scheme, 21 per cent farmers to meet their future need and of 13 per cent to become financially independent. (Figure 3).

Table 2: Change in perception/knowledge level after training

n=100

Variables	Per cent of respondent		
	Before training (2010-11)	After training (2014-15)	Increase perception level (%)
Knowledge with edibility of mushroom	46	72	26
Mushroom consumption	20	54	34
Preliminary knowledge of mushroom cultivation	15	65	50
Profitability in mushroom cultivation	12	46	34

Table 3: Income of the mushroom cultivation enterprise in proportion to family income

n=100

Increase in household income due mushroom cultivation (%)	Mushroom cultivation Number of respondents/Feed back (N=100)
2-5	17
6-8	29
9-12	25
12-15	16
16-20	13

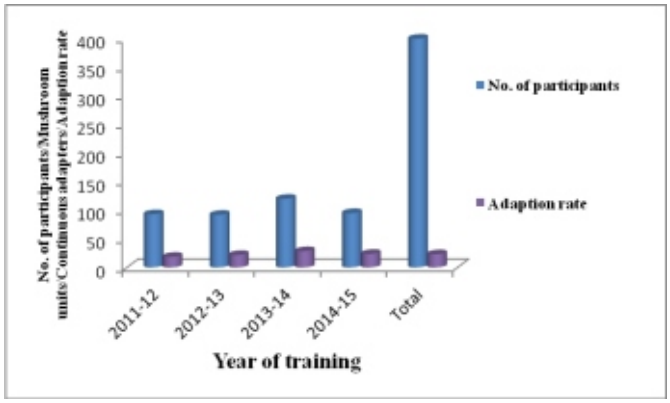

Figure 2: Training programs organized and adoption rate of mushroom cultivation in Eastern Bihar, 2012-15

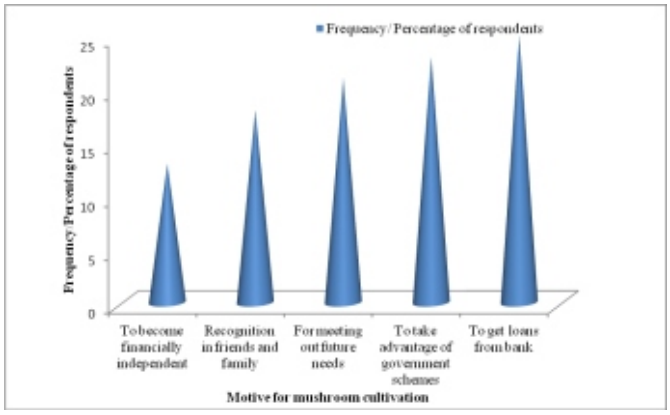

Figure 3: People response of motive to grow mushroom (N=100)

Biswas (2015) has also studied on knowledge and perception level on mushroom cultivation technology, their food and nutritional values, economics in cultivation, profitability, *etc.* and has disseminated technology through channels like literature and FLD. He has succeeded to gain the impact of training several folds. Several other workers have also reported the effectiveness of training programme on mushroom cultivation and upliftment in the livelihood of the rural workers (Das, 2015; Ambili and Nithya, 2014; Sajeev *et al,* 2012). However, the training programmes were successful in spreading awareness among people regarding mushroom and spawn cultivation. But, still there is a need to intensify training and awareness programmes in order to cover wider population and to meet their future needs.

CONCLUSION

The data recorded based on different parameters aftermath the training program mushroom resulted into great impact on mushroom farmers and helped in raising their additional income and creating additional employment opportunities. The awareness program was very much successful in disseminating the knowledge of mushroom cultivation among the community and must be conducted frequently selecting appropriate zone to cover more and more population. The mushroom/s can also be cultivated around the year with investment of comparatively lower capital utilizing locally available material. The reform in market regulations and policy is also required to market the product directly to the processors, exporters and trade houses. More establishment of processing industries and improved value addition techniques are required to channelize the overproduced mushroom by farmers.

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