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Impact analysis of skill development training on mushroom cultivation of rural women in Raigarh district of Chhattisgarh

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Abstract
The current study was carried out to evaluate the effects of skill development training on mushroom cultivation. Krishi Vigyan Kendra, Raigarh conducted skill development trainings to evaluate the profitability of mushroom production from 2022 to 2024. The study revealed that the benefit-cost ratio for oyster mushroom cultivation was 3.4, which is considered notable. The majority of participants in the training program joined to acquire knowledge on mushroom growing techniques, either for personal use or to pursue business opportunities. The study revealed that the majority of respondents improved their ability to identify edible mushrooms, increasing from 12.2% to 85.7%, reflecting a gain of 73.5%. This study was conducted on 84 farm women of selected 4 blocks of Raigarh district of Chhattisgarh.

Keywords: Mushroom, Skill development, training, entrepreneur.

Introduction
Mushroom production is emerging as a profitable business in the agricultural sector. It not only enhances the income source for women farmers but also fulfils nutritional requirements. However, this field requires specific training programs. These programs provide women with the latest production techniques and market-related information, enabling them to increase their income and access new livelihood opportunities. Mushroom farming originated in the early 18th century. At present, the world’s total edible and medicinal mushrooms production was estimated at over 34 million tonnes. This is accounted for about 87% of total production (Royse *et al.*, 2017) [1].

Mushroom farming requires less capital investment, and varieties of mushrooms can be grown around the year. The mushroom substrate is clean agricultural waste material that is readily available and can be produced in temporary structures and arrangements (Shahi and Singh 2018) [2].

Mushroom cultivation is becoming more popular worldwide because of its benefits to nutrition, health, and the economy. It can significantly improve livelihoods by providing a low-cost and sustainable source of income. Mushroom production is cost-effective and doesn’t require a lot of space or any special equipment. Since mushrooms are grown indoors, they can be produced in small areas, making them ideal for small farms or urban farming. During the fruiting phase, mushrooms need a temperature ranging from 15 to 20 degrees Celsius and about 85% humidity to grow properly. Oyster mushrooms are cultivated using a substrate prepared by combining mushroom spawn with crop residues such as wheat straw, paddy straw, mustard residue, and others. A mushroom is a type of fungus that generally has gills beneath its dome-shaped cap, which is supported by a stalk. Mushrooms, also known as “white vegetables” or “boneless vegetarian meat,” are high in fibre, vitamins, proteins and essential minerals [3, 4]. During the growing season, Krishi Vigyan Kendra, Raigarh provided skill-development training with demonstration. Mushrooms are a valuable source of nutrition and can also serve as a means of income generation. Mushrooms, along with other fleshy fungi, offer a delicious and nutrient-rich option for a vegetarian diet.

According to Rana *et al.* [5], mushrooms are considered both nutritious and therapeutic due to their high content of protein, minerals, and vitamins, while being low in calories. Encouraging the cultivation of mushrooms could improve both food and nutritional security, and enhance the role of women by providing them with extra income and enabling them to participate more actively in household decision-making. Mushroom farming, being a fast-growing and nutritious food source, can also offer a stable income, thus helping to reduce poverty and improve livelihoods [6]. Mushroom farming is more profitable than many other types of farming because it provides income within a short period of 45 to 50 days after sowing. The agricultural climate in Raigarh district is ideal for growing oyster mushrooms for nine to ten months, from mid-June to early March. Farm women perceive mushroom production as a cost-effective, home-based business requiring minimal investment and effort. Technological advancements have significantly boosted the adoption of mushroom farming as a livelihood option among resource-poor farming families. In addition to contributing to nutritional security, it has positively impacted the socioeconomic status of these families. Mushroom farming is also gaining popularity among landless women, as it requires minimal infrastructure and is cost-effective. The skill development training programs on mushroom cultivation organized by Krishi Vigyan Kendra, Raigarh, have played a key role in promoting mushroom production. After acquiring the necessary skills and knowledge, many trained individuals began mushroom production successfully. Their achievements inspired neighbouring farmers, women, and rural youth to take up mushroom farming themselves. This study aims to assess the impact of these training programs on trainees. An evaluation study of such entrepreneurial training programmes would help to give idea about the possibility of improving the training programme in future. In order to know the impact of these training programmes on knowledge up gradation of the trainees, the present study was conducted.

Materials and Methods

The study was conducted in four blocks of Raigarh district, Chhattisgarh, focusing on skill development training for mushroom cultivation. Krishi Vigyan Kendra, Raigarh, conducted three separate skill development training programs, each lasting six days, during the period from 2022 to 2024. The training sessions were designed to build practical skills and covered topics such as an introduction to mushrooms, their health and medicinal benefits, cultivation techniques, value addition, pest and disease management, and the preparation of mushroom spawn. Regular visits were made to monitor the mushroom units established by the trainees, and feedback was gathered through personal interactions. To support learning, technical literature was distributed among selected women farmers. The impact of the training programs was assessed using a structured questionnaire that included questions about participants' general information, background, and landholding details. A pre-training test was conducted to understand the participants' initial knowledge on topics such as mushroom varieties, nutritional value, pest management, straw sterilisation method, harvesting methods, and storage techniques. Likewise, a post-evaluation was conducted after the training course to assess the knowledge acquired by the trainees and the overall effectiveness of the training. The evaluation included questions on mushroom growing methods, nutritional content, value-added products, storage, and harvesting methods. The knowledge gained was determined by calculating the difference between the pre-test and post-test scores.

Result and Discussion

The table provides a socio-economic profile of 84 women trainees who attended mushroom cultivation training. All participants were female, with the majority (73.80%) aged up to 25 years, followed by 21.42% aged 25-40 years, and 4.76% above 40 years. In terms of caste, 54.76% belonged to Backward Classes, 42.85% to Scheduled Castes, and 2.38% to others. Educationally, most respondents had completed higher secondary education (40.47%), followed by high school (26.19%), middle school (16.67%), primary education (9.52%), and graduation (4.77%), with 2.38% having postgraduate qualifications. Occupationally, 54.76% were farmers, 21.43% students, 16.67% housewives, and 7.14% in service. Regarding landholding, 69.05% had marginal holdings (≤1 ha), 26.19% were landless, and 4.76% owned large landholdings (>1 ha). Income-wise, 64.29% were in the low-income group, 33.33% in the medium-income group, and 2.38% in the high-income group. This data highlights the participants' diverse socio-economic backgrounds, emphasizing the importance of skill-based training for their empowerment. From the evaluation, it was evident that mushroom farming requires very little land, making it an appealing option for landless farmers to enhance their family income.

The study revealed that the benefit-cost ratio for mushroom cultivation was 3.4, which indicates a positive return. The total cost of cultivating 50 bags of oyster mushrooms was Rs. 1,600.00 (Table 2). A similar outcome was reported by Sarkar et al [7].

The table 2 highlights the cost and profitability of cultivating oyster mushrooms using 50 bags (1 unit) during the winter season. The total cost of cultivation is Rs 1,600 per unit, which produces 47.5 kg of mushrooms. These mushrooms are sold at a market rate of Rs 110 per kg, generating a gross income of Rs 5,225 per unit. After deducting the cultivation cost, the net profit amounts to Rs 3,625 per unit, reflecting a significant profit margin. The benefit-cost ratio of 3.4 indicates that for every Rs 1 spent on cultivation, a return of Rs 3.40 is achieved. This demonstrates the economic potential and profitability of oyster mushroom farming, particularly in the winter season.

Table 3 demonstrates the knowledge enhancement among trainees concerning various aspects of mushroom cultivation after undergoing training. The table compares the pre-evaluation and post-evaluation knowledge levels, highlighting significant improvements in all areas. For instance, the understanding of edible mushroom identification increased from 12.2% to 85.7%, with a gain of 73.5%. Similarly, awareness of the nutritional benefits of mushrooms rose from 11.5% to 86.7%, reflecting a gain of 75.2%.

Table 1: Socio-economic profile of women trainees. (N= 84)

S. No.	Particular	Trainees attended mushroom cultivation	
		Frequency	Percentage
1	Gender		
	Male	0	0
	Female	84	100
2	Age		
	Up to25 years	62	73.80
	25-40 years	18	21.42
	Above 40 years	4	4.76
3	Caste		
	Schedule caste	36	42.85
	Backward caste	46	54.76
	Others	2	2.38
4	Education		
	Primary	8	9.52
	Middle	14	16.67
	High school	22	26.19
	Higher Secondary	34	40.47
	Graduate	4	4.77
	Post graduate	2	2.38
5	Occupation		
	Farming	46	54.76
	Service	6	7.14
	House wife	14	16.67
	Student	18	21.43
6	Land holding		
	Land less	22	26.19
	Marginal(< 1 ha)	58	69.05
	Big(> 1 ha)	4	4.76
7	Annual income		
	Low	54	64.29
	Medium	28	33.33
	High	2	2.38

Table 2: Cost of Cultivation of Oyster Mushroom

S. No.	Particular	
1	Cost of Cultivation (Rs)	1600 / per 50 bags (1 unit)
2	Production per unit (Kg.)	47.5
3.	Market rate (Rs.)	110
4.	Gross Return / unit on crop of winter season (Rs)	5225
5.	Net Return Rs./ unit (Rs.)	3625
6.	Benefit cost ratio:	3.4

Table 3: Gain in knowledge level of trainees with respect to different operations (N-84)

S. No.	Particulars	Pre-training knowledge percentage	Pre-training knowledge percentage	Gain in knowledge
1	Awareness of edible mushroom identification	12.2	85.7	73.5
2	Health and nutritional advantages of mushrooms	11.5	86.7	75.2
3	Varieties of mushrooms	5.2	81.3	76.1
4	Medicinal applications of mushrooms in disease management.	3.3	74.6	71.3
5	Cultivation techniques for different mushroom types.	7.5	88.1	80.6
6	Straw sterilization methods	8.9	88.3	79.4
7	Financial aspects: Cost and income in mushroom farming	27.2	100	72.7
8	Management of common pests and diseases in mushrooms	3.8	74.4	70.6
9	Process of mushroom spawn preparation	0	45.2	45.2
10	Techniques for mushroom harvesting and storage	7.5	86.2	78.7
11	Value-added mushroom products.	7.2	91.2	83.9
12	Knowledge of financial support, schemes, and subsidies for mushroom farming units	22.00	92.6	70.6

Knowledge of different mushroom types also improved significantly, with a gain of 76.1%.

Practical aspects, such as cultivation techniques (80.6% gain), straw sterilization methods (79.4% gain), and harvesting and storage (78.7% gain), saw substantial growth, indicating the training's effectiveness in building technical skills. Economic aspects like cost and income from mushroom farming achieved a complete post-training knowledge score, while the preparation of mushroom spawn, which started at 0%, showed some improvement but remains an area for further focus. Overall, the data underscores the training program's success in imparting valuable knowledge across various critical dimensions of mushroom farming.

Table 4: Reasons of participation of training programme in mushroom cultivation

S. No.	Reasons	Frequency	Percentage
1	To learn about mushroom growing techniques for self-consumption	26	30.9
2	To adopt secondary income generate activities using locally available resources.	10	11.9
3	To adopt mushroom cultivation as an enterprise	24	28.5
4	To get certificate of training course for loan from bank and for Govt. subsidy etc.	16	19
5	Just to Know about mushroom cultivation.	6	7.1
6.	Learn technology of mushroom spawn production	2	2.3

The table 4 highlights the reasons for participation in a mushroom cultivation training program. The majority of participants (30.9%) attended to learn techniques for self-consumption, while 28.5% aimed to adopt mushroom farming as a business enterprise. A significant portion (19%) sought certification to access bank loans or government subsidies, reflecting the role of financial incentives. Additionally, 11.9% participated to explore secondary income opportunities using locally available resources, and 7.1% joined out of curiosity to gain general knowledge about mushroom cultivation. A smaller group (2.3%) focused on learning the technical aspects of spawn production. Overall, the data reflects a mix of motivations, with a strong emphasis on self-consumption and entrepreneurial aspirations.

This shows that mushroom cultivation training addresses diverse needs, ranging from personal consumption to enterprise development, and plays a crucial role in empowering participants with knowledge and financial opportunities. The assessment shows that mushroom farming needs very little land, making it a suitable option for landless farmers to boost their family income.

Training programme on mushroom cultivation

Training programme on mushroom cultivation

Mushroom production for income generation

Mushroom production for income generation

Mushroom production units of the trainees

Impact assessment after the training program

Conclusion

The study shows that training programs play an important role in helping people learn the skills and knowledge needed to start and grow agricultural businesses. Mushroom farming is a great example of income generation for farm women because it requires very little land and low investment. This means even people without land, like landless farm women, can earn a good income from mushroom cultivation.

The training programs were especially beneficial for farm women. They were surprised by how successful mushroom farming can be. Now, women from the villages where the training was conducted are very interested in starting mushroom farming. They see it as a reliable way to earn money throughout the year because mushrooms are always in demand.

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