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Impact of KVK interventions on income enhancement and livelihood security of farm women through paddy straw mushroom cultivation

Manisha Choudhary

Subject Matter Specialist (Home Science), KVK Raigarh, Chhattisgarh, India

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Corresponding Author: Manisha Choudhary

Abstract

Paddy straw mushroom (*Volvariella volvacea*) cultivation has emerged as a promising enterprise for income generation, nutritional security and livelihood improvement among rural women. The present investigation was carried out in five blocks of Raigarh district of Chhattisgarh during 2023 to 2025 to assess the impact of Krishi Vigyan Kendra (KVK) interventions on knowledge enhancement, technology adoption and economic benefits derived from paddy straw mushroom cultivation by farm women. During the study period, KVK Raigarh organized eight training programmes covering 188 women beneficiaries. The socio-economic profile revealed that a majority of the trainees belonged to the younger age group and marginal and landless categories and were primarily engaged in farming activities. A considerable improvement in knowledge regarding different aspects of mushroom cultivation was observed after training, with the highest gain recorded in financial support and subsidy schemes (83.4%), value-added mushroom products (82.9%) and cultivation techniques (82.3%). Out of 188 trained women, 35 beneficiaries adopted paddy straw mushroom cultivation technology, recording an overall adoption rate of 18.62 per cent. Economic analysis showed an average production of 85 kg per unit with a cultivation cost of Rs. 4,900 and a net return of Rs. 12,100, resulting in a benefit-cost ratio of 3.4. The study indicated that KVK interventions significantly improved knowledge, technology adoption and profitability of paddy straw mushroom cultivation, thereby contributing to income enhancement, livelihood security and women empowerment among rural women.

Keywords: Paddy straw mushroom, farm women, KVK interventions, income enhancement, livelihood security, women empowerment

Introduction

Women constitute a major workforce in Indian agriculture and play an important role in crop production, livestock management and household food security. However, rural women often face seasonal unemployment and limited opportunities for additional income generation. Therefore, promotion of low-cost enterprises capable of generating supplementary income is essential for improving their socio-economic status and livelihood security.

Mushroom cultivation has emerged as a promising enterprise due to its low investment requirement, short production cycle and high economic returns. Among the various edible mushrooms, paddy straw mushroom (*Volvariella volvacea*) is one of the most popular mushrooms cultivated in India and is considered the third most important mushroom grown worldwide. Mushroom cultivation has gained global importance because of its nutritional, medicinal and economic value (Chang and Miles, 1992) [8]. Recent studies have highlighted the increasing importance and potential of paddy straw mushroom cultivation as a profitable and sustainable enterprise for rural households (Ojha *et al.*, 2025) [3]. Owing to its low cost and profitability, paddy straw mushroom cultivation has emerged as an important enterprise for small and marginal farmers.

Mushroom cultivation requires comparatively less capital investment and can be practiced under temporary or low-

cost structures. Agricultural residues and wastes are effectively utilized as substrates, making the enterprise environmentally sustainable. Shahi *et al.* (2018) [1] reported that mushroom cultivation provides opportunities for entrepreneurship development and women empowerment. Similarly, Yadav and Mishra (2020) [2] observed that farmers who received training in mushroom cultivation experienced a considerable increase in household income.

Paddy straw mushroom can be cultivated during the rainy season, particularly from June to September, under temperature conditions ranging from 25 to 35°C and relative humidity of 75 to 80 per cent. Besides being economically profitable, mushrooms are highly nutritious and contain appreciable amounts of proteins, vitamins, minerals and B-complex vitamins (Caglarirmak, 2007) [4]. Michael *et al.* (2011) [9] also reported that edible mushrooms are valuable sources of nutrients and contribute significantly to nutritional security. A variety of agricultural residues such as paddy straw, wheat straw, rice bran, wheat bran, cotton waste, sugarcane bagasse and banana leaves can be used as substrates for cultivation (Tripathy, 1999; Maurya *et al.*, 2016) [5, 6], thereby promoting efficient utilization of agricultural waste. Efficient utilization of agricultural and agro-industrial residues through mushroom cultivation provides an eco-friendly approach for waste management (Cangy and Peerally, 1995) [7].

Krishi Vigyan Kendras (KVKs) play an important role in

dissemination of improved agricultural technologies through training programmes, demonstrations and advisory services. In recent years, Krishi Vigyan Kendra, Raigarh has actively promoted paddy straw mushroom cultivation among farm women and Self-Help Groups through skill development programmes and technical support. Adoption of this enterprise has not only generated additional income but has also contributed towards nutritional security and reduction of seasonal unemployment among rural women.

Considering the increasing importance of mushroom cultivation as a livelihood enterprise, the present investigation was undertaken to assess the impact of Krishi Vigyan Kendra interventions on knowledge enhancement, technology adoption and income generation through paddy straw mushroom cultivation among farm women in Raigarh district of Chhattisgarh.

Materials and Methods

The present investigation was carried out in five blocks of Raigarh district of Chhattisgarh during the period from 2023 to 2025. Krishi Vigyan Kendra (KVK), Raigarh organized eight training programmes on paddy straw mushroom cultivation, each of five days duration, with the objective of enhancing the technical knowledge and skills of farm women regarding mushroom production and related activities.

The training programmes included both theoretical and practical sessions covering various aspects such as introduction to mushrooms, health and medicinal importance, cultivation techniques, pest and disease management, value addition of mushroom products, and mushroom spawn preparation. A total of 188 farm women participated in these training programmes.

The impact of the training programmes was assessed using a structured questionnaire comprising information related to socio-economic characteristics, occupation, landholding pattern, and other relevant details of the respondents. To evaluate the effectiveness of the training, pre-training and post-training assessments were conducted. The pre-training evaluation was carried out to assess the existing knowledge of participants regarding mushroom varieties, nutritional importance, pest and disease management, straw sterilization, harvesting, value addition and storage practices. Similarly, a post-training evaluation was conducted after completion of the training programme to measure the improvement in knowledge and understanding acquired by the trainees. The knowledge gain was determined by calculating the difference between pre-training and post-training scores.

Data regarding training programmes conducted, beneficiaries covered, and adoption of paddy straw mushroom cultivation were collected from the records maintained by Krishi Vigyan Kendra, Raigarh. Economic analysis of mushroom cultivation was carried out using parameters such as cost of cultivation, gross return, net return, and benefit-cost ratio. The collected data were analysed using simple statistical tools such as frequency and percentage.

The benefit-cost ratio was calculated using the following formula:

$$B:C \text{ Ratio} = \frac{\text{Gross Return}}{\text{Cost of Cultivation}}$$

Results

Table 1: Socio-economic Profile of Women Trainees (N=188)

SN	Particulars	Frequency	Percentage
1	Gender		
	Female	188	100.00
	Male	0	0
2	Age		
	Up to 25 years	146	77.66
	26–40 years	28	14.89
	Above 40 years	14	7.45
3	Caste		
	Scheduled Caste	86	45.74
	OBC	98	52.13
	Others	4	2.13
4	Education		
	Primary	26	13.83
	Middle	28	14.89
	High School	44	23.40
	Higher Secondary	82	43.62
	Graduate	5	2.66
	Postgraduate	3	1.60
5	Occupation		
	Farming	122	64.89
	Service	14	7.45
	Housewife	28	14.89
	Student	24	12.77
6	Landholding		
	Landless	76	40.43
	Marginal (<1 ha)	82	43.62
	Above 1 ha	30	15.96
7	Annual Income		
	Low	112	59.57
	Medium	69	36.70
	High	7	3.72

The socio-economic profile of the trainees revealed that all the respondents were female beneficiaries, as the training programmes were specifically organized for farm women. A majority of the respondents (77.66%) belonged to the age group of up to 25 years, followed by 14.89 percent in the age group of 26–40 years and 7.45 percent above 40 years. This indicates a higher participation of young women in mushroom cultivation activities.

With respect to social category, more than half of the respondents (52.13%) belonged to Other Backward Classes (OBC), followed by Scheduled Castes (45.74%). In terms of education, the majority of respondents (43.62%) had completed higher secondary education, while 23.40 per cent had studied up to high school level. Farming was the primary occupation of 64.89 per cent of respondents. A large proportion of trainees were marginal farmers (43.62%) and landless women (40.43%), indicating that paddy straw mushroom cultivation is highly suitable for resource-poor households due to its low investment requirement. Furthermore, 59.57 percent of respondents belonged to the low-income category, highlighting the potential of mushroom cultivation as a livelihood enhancement enterprise.

Table 2: Gain in Knowledge Level of Trainees (N=188)

Particulars	Pre-training knowledge (%)	Post-training knowledge (%)	Gain in knowledge (%)
Awareness of edible mushroom identification	11.2	82.7	71.5
Health and nutritional advantages	12.2	84.7	72.5
Varieties of mushrooms	6.8	78.3	71.5
Medicinal applications	4.4	74.6	70.2
Cultivation techniques	6.8	89.1	82.3
Straw sterilization	6.3	87.3	81.0
Cost and income aspects	20.2	98.0	77.8
Pest and disease management	2.8	72.4	69.6
Spawn preparation	0.0	47.2	47.2
Harvesting and storage	6.9	85.2	78.3
Value-added products	7.3	90.2	82.9
Financial support and subsidies	8.2	91.6	83.4

The results presented in Table 2 indicate a substantial increase in the knowledge level of trainees following participation in the mushroom cultivation training programmes conducted by Krishi Vigyan Kendra. The highest gain in knowledge was observed regarding financial support and subsidy schemes (83.4%), followed by value-added mushroom products (82.9%), cultivation techniques (82.3%), and straw sterilization methods (81.0%). These findings demonstrate the effectiveness of the training programmes in improving both technical and entrepreneurial knowledge among farm women.

Knowledge related to harvesting and storage techniques, cost and income aspects, and health and nutritional benefits of mushrooms also increased considerably after training. Although knowledge regarding spawn preparation showed improvement, the gain was comparatively lower (47.2%) due to the technical complexity of the process. Overall, the results clearly indicate that KVK training programmes were highly successful in enhancing the technical competency and awareness of participants regarding paddy straw mushroom cultivation.

Table 3: Year-wise Training Programmes Conducted, Adoption of Paddy Straw Mushroom Cultivation and Adoption Percentage among Farm Women

Year	Trainings	Beneficiaries	Women Adopted	Adoption (%)
2023	2	48	9	18.75
2024	3	72	14	19.44
2025	3	68	12	17.65
Total	8	188	35	18.62

The data reveal that a total of eight training programmes on paddy straw mushroom cultivation were organized by KVK Raigarh during the study period, covering 188 farm women. The highest number of beneficiaries (72) was recorded during 2024, followed by 68 beneficiaries during 2025. The increasing participation of women indicates growing awareness and interest in mushroom cultivation as an alternative livelihood enterprise.

Out of the 188 trained beneficiaries, 35 women adopted paddy straw mushroom cultivation technology. The highest adoption percentage was observed during 2024 (19.44%), followed by 18.75 per cent during 2023 and 17.65 per cent during 2025. The overall adoption rate of 18.62 per cent demonstrates the positive influence of KVK interventions in motivating farm women to adopt mushroom cultivation as an income-generating activity.

Table 4: Economics of Paddy Straw Mushroom Cultivation under Recommended Practices

Particulars	Value
Production (kg/unit)	85
Cost of cultivation (Rs.)	4900
Gross return (Rs.)	17000
Net return (Rs.)	12100
B:C Ratio	3.4

The economic analysis clearly demonstrates the profitability of paddy straw mushroom cultivation under recommended production practices. An average production of 85 kg per unit was obtained with a cultivation cost of Rs. 4,900. The average gross return and net return were Rs. 17,000 and Rs. 12,100 per unit, respectively.

The benefit-cost ratio of 3.4 indicates that every rupee invested in mushroom cultivation generated a return of Rs. 3.40. The high net return and favourable benefit-cost ratio confirm that paddy straw mushroom cultivation is a financially viable enterprise for farm women. The enterprise provides an opportunity for additional income generation with minimal investment and efficient utilization of locally available paddy straw, thereby contributing to livelihood security and women empowerment.

Discussion

The findings of the present study showed that Krishi Vigyan Kendra interventions played an important role in improving the knowledge, skills and adoption of paddy straw mushroom cultivation among farm women in Raigarh district. Through training programmes, demonstrations and regular technical support, KVK promoted mushroom cultivation as a low-cost and profitable enterprise for rural women and Self-Help Groups.

A considerable increase in knowledge was observed among the trainees after attending the training programmes. Higher knowledge gain was recorded in areas such as financial support and subsidy schemes, value-added mushroom products and cultivation techniques. This indicates that the training programmes were effective in improving both technical and practical knowledge of farm women. However, comparatively lower knowledge gain was observed in mushroom spawn preparation, which may be due to the technical nature of the process.

The adoption of paddy straw mushroom cultivation by trained women clearly indicates the positive impact of KVK interventions. The enterprise was found to be economically

profitable, with a benefit-cost ratio of 3.4. The additional income generated through mushroom cultivation can improve the livelihood of rural families and reduce seasonal unemployment among farm women.

The findings of the present study are in agreement with those reported by Shahi *et al.* (2018) ^[1], who observed that mushroom cultivation helped in entrepreneurship development and women empowerment. Similarly, Yadav and Mishra (2020) ^[2] reported that training in mushroom cultivation improved household income and socio-economic conditions of rural families. The results are also supported by Maurya *et al.* (2016) ^[6], who reported that agricultural residues can be effectively used as substrates for profitable mushroom cultivation.

Overall, the findings suggest that paddy straw mushroom cultivation can serve as an effective livelihood option for farm women. Therefore, regular training programmes, timely availability of quality spawn and promotion of value-added mushroom products may further enhance the adoption and profitability of mushroom cultivation in rural areas.

Conclusion

The study clearly demonstrated that Krishi Vigyan Kendra interventions played a crucial role in promoting paddy straw mushroom cultivation among farm women in Raigarh district. Training programmes significantly improved knowledge, technical skills and adoption of mushroom cultivation practices. The enterprise proved economically viable with a benefit-cost ratio of 3.4 and generated additional income for rural households. Furthermore, mushroom cultivation contributed towards nutritional security, efficient utilization of agricultural residues and reduction of seasonal unemployment. Therefore, paddy straw mushroom cultivation may be promoted as a sustainable livelihood option for farm women and Self-Help Groups through continuous capacity building and technical support.

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