



Promotion of Mushroom Cultivation as a Livelihood Option in Remote Villages of Kabirdham District, Chhattisgarh

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Mushroom cultivation is emerging as a promising livelihood enterprise for rural communities because of its low investment requirement, short production cycle, limited land requirement and potential for regular income generation. The present study was undertaken to promote mushroom cultivation as an alternative livelihood option among rural and tribal communities in remote villages of Kabirdham district, Chhattisgarh. A 22-day Skill Development Training Programme on Mushroom Cultivation was conducted from 10 to 31 December 2025 at Rengakhar Kalan, Bodla Block, Kabirdham district, under the I-Rise Programme. The programme was jointly organized by Syngenta India Pvt. Ltd. and Syngenta Foundation India, with support from Samaj Chetna Kendra, Patna, Bihar. A total of 47 participants from Kabirdham, Balaghat and Mandla districts participated in the programme. The training comprised classroom lectures, practical demonstrations, hands-on exercises, group discussions and field-based learning, covering mushroom biology, substrate preparation, pasteurization, spawn inoculation, incubation, crop management, harvesting, packaging, marketing and entrepreneurship. Among the participants, 44.68% were 12th pass, 25.53% graduates and 17.02% postgraduates. Socially, 53.19% belonged to OBC, 31.91% to ST and 8.51% to SC communities. District-wise, 59.57% were from Kabirdham, 38.30% from Balaghat and 2.13% from Mandla. Average attendance exceeded 90%, while the highest mid-term score was 42 out of 50. The findings demonstrate that skill-based training with practical exposure can enhance technical knowledge and confidence, highlighting mushroom cultivation as a viable option for livelihood diversification, employment generation and nutritional security in remote rural communities.

Keywords: Mushroom cultivation, livelihood, rural communities, tribal farmers, skill development, oyster mushroom, Kabirdham

Introduction

Agriculture remains the primary source of livelihood for a large proportion of rural households in India. However, small and fragmented landholdings, seasonal employment, fluctuating agricultural returns and limited access to modern technologies often constrain the income-generating capacity of small and marginal farmers. The development of alternative and supplementary livelihood enterprises is therefore essential for improving rural household income and employment opportunities. Mushroom cultivation has emerged as an important agricultural enterprise because of its relatively low investment requirement, short production cycle, limited space requirement and potential for generating high returns. Unlike conventional field crops, mushrooms can be cultivated indoors and therefore do not require large areas of cultivable land. Agricultural residues such as paddy straw, wheat straw, maize residues and other lignocellulosic materials can be utilized as substrates, converting low-value farm waste into nutritious food and marketable products.

Edible mushrooms are nutritionally valuable foods containing proteins, vitamins, minerals, dietary fibre and essential amino acids. Their incorporation into rural diets can contribute to nutritional diversification and food security. At the same time, mushroom cultivation can create self-employment opportunities for rural youth, farm women and smallholder farmers. Kabirdham district of Chhattisgarh includes several remote and tribal-dominated areas where agriculture and allied activities constitute important sources of livelihood. In such areas, enterprises requiring limited land and capital and capable of generating returns within a short period are particularly relevant. Oyster mushroom (*Pleurotus* spp.) is especially suitable because it can be cultivated on locally available agricultural residues using relatively simple techniques. The promotion of mushroom cultivation requires more than simply distributing inputs. Farmers and rural youth need practical knowledge regarding spawn quality, substrate preparation, pasteurization, moisture management, incubation, environmental conditions, contamination management, harvesting, packaging and marketing. Skill-development programmes combining theoretical instruction with hands-on practical training can play an important role in facilitating the adoption of mushroom cultivation. Against this background, a 22-day Skill Development Training Programme on Mushroom Cultivation was organized at Rengakhar Kalan, Bodla Block, Kabirdham district, Chhattisgarh. The programme aimed to provide rural and tribal beneficiaries with technical knowledge and practical skills and to motivate them to adopt mushroom cultivation as a sustainable livelihood enterprise.

Objectives

The study was undertaken with the following objectives:

1. To promote mushroom cultivation among rural households in remote villages of Kabirdham district through training and demonstration programmes.
2. To assess the participation, learning performance and response of rural beneficiaries towards mushroom cultivation as a livelihood enterprise.
3. To document the potential of mushroom cultivation for income generation, self-employment and livelihood diversification among rural and tribal communities.

Materials and Methods

Study Area

The Skill Development Training Programme was conducted at Rengakhar Kalan, Bodla Block, Kabirdham District, Chhattisgarh, from 10 December 2025 to 31 December 2025. The 22-day programme was implemented under the I-Rise Programme and jointly organized by Syngenta India Pvt. Ltd. and Syngenta Foundation India, with support from Samaj Chetna Kendra, Patna, Bihar. The study area represents a rural and tribal setting where agriculture is an important livelihood activity. The programme was designed to introduce mushroom cultivation as an additional enterprise requiring comparatively limited land and investment.

Selection of Participants

A total of 47 participants were enrolled in the training programme. The participants included rural youth, farmers, farm women and members of tribal communities. Participants were drawn primarily from Kabirdham district of Chhattisgarh and adjoining Balaghat and Mandla districts of Madhya Pradesh. Participants were selected based on their interest in acquiring skills related to mushroom cultivation and their willingness to explore mushroom production as an income-generating activity.

Training Methodology

A participatory and practical training methodology was followed. The programme included:

- Classroom lectures
- Practical demonstrations
- Hands-on training
- Group discussions
- Field-based learning
- Mid-term assessment
- Participant feedback and interaction



Inaugural Orientation Programme and Theory Classes Conducted During the Training at Rengakhar Kalan



Theory Session and Stepwise Demonstration of Oyster Mushroom Cultivation: Chopping of Paddy Straw, Straw Treatment and Sieving



Theory Session and Stepwise Demonstration of Oyster Mushroom Cultivation: Spawning, Bag Filling, Incubation and Harvesting

The major technical areas covered during the programme were:

1. Importance and scope of mushroom cultivation
2. Nutritional and medicinal importance of edible mushrooms
3. Identification of suitable mushroom species
4. Selection and preparation of substrate
5. Pasteurization of paddy straw
6. Spawn selection and handling
7. Bag filling and spawn inoculation
8. Spawn running and incubation management
9. Environmental requirements for mushroom production
10. Crop management and hygiene
11. Fruiting management
12. Harvesting and grading
13. Packaging and storage
14. Marketing and value addition
15. Cost of cultivation and economic returns
16. Entrepreneurship development

Materials Used

The following materials were used during practical training and demonstrations:

- Oyster mushroom (*Pleurotus* spp.) spawn
- Paddy straw
- Polyethylene bags
- Plastic rope and rubber bands
- Water drums
- Sprayers
- Pasteurization containers
- Weighing balance
- Disinfectants and sanitizing materials
- Mushroom cultivation room with appropriate ventilation and humidity management

Practical Demonstration

Participants were trained in the complete production process of oyster mushroom. Paddy straw was chopped, soaked, pasteurized and drained before being used as the cultivation substrate. The prepared substrate was layered with mushroom spawn in polyethylene bags. The inoculated bags were maintained under suitable environmental conditions for spawn running. After adequate colonization, the bags were opened or appropriately perforated to facilitate fruiting. Participants were trained in maintaining moisture, humidity and ventilation and in identifying suitable harvesting stages. Practical sessions also covered harvesting, cleaning, grading, weighing and packaging of fresh mushrooms.

Data Collection

Participant information including educational qualification, social category, village, district and state was recorded. Attendance records, mid-term examination performance, practical participation, participant feedback and willingness to adopt mushroom cultivation were also documented.

Data Analysis

The collected data were compiled and analyzed using descriptive statistical methods. Frequency and percentage were calculated to describe the socio-educational characteristics of participants and their participation in the training programme.

Results

Participation in the Training Programme

A total of 47 participants participated in the 22-day Skill Development Training Programme. The participants represented different educational, social and geographical backgrounds. The participation of rural youth, farmers, women and tribal beneficiaries demonstrated the relevance of mushroom cultivation as a potential livelihood enterprise in rural areas.

Educational Profile of Participants

The educational background of participants varied from secondary education to postgraduate level, indicating that mushroom cultivation can attract individuals with diverse educational backgrounds.

Table 1. Educational Profile of Participants

Educational qualification	Number	Percentage (%)
10th Pass	3	6.38
12th Pass	21	44.68
Graduation	12	25.53
Post Graduation	8	17.02
Information not available	3	6.38
Total	47	100.00

The largest group consisted of participants who had completed 12th standard (44.68%). Graduates accounted for 25.53%, while 17.02% were postgraduates. Thus, 42.55% of the participants were graduates or postgraduates, indicating substantial interest among educated rural youth in skill-based agricultural entrepreneurship.

Social Category of Participants

The programme successfully included participants belonging to socially and economically diverse communities.

Table 2. Social Category of Participants

Social category	Number	Percentage (%)
Other Backward Class (OBC)	25	53.19
Scheduled Tribe (ST)	15	31.91
Scheduled Caste (SC)	4	8.51
Information not available	3	6.38
Total	47	100.00

The OBC category represented the largest proportion of participants (53.19%), followed by ST participants (31.91%) and SC participants (8.51%). Collectively, OBC and ST participants constituted **85.10%** of the total participants, demonstrating substantial outreach to socially disadvantaged and tribal communities.

District-wise Distribution of Participants

Participants were drawn from three districts located in Chhattisgarh and neighbouring Madhya Pradesh.

Table 3. District-wise Distribution of Participants

District	Number	Percentage (%)
Kabirdham, Chhattisgarh	28	59.57
Balaghat, Madhya Pradesh	18	38.30
Mandla, Madhya Pradesh	1	2.13
Total	47	100.00

The highest participation was recorded from Kabirdham district (59.57%), where the programme was conducted. A substantial proportion of participants (38.30%) came from Balaghat district, while one participant was from Mandla district. The participation of beneficiaries from neighbouring districts indicates the wider relevance of mushroom cultivation training as a livelihood-development intervention in the region.

Attendance Performance

Attendance was considered an important indicator of participant interest and commitment. The majority of trainees maintained attendance between 95 and 100%, while several participants recorded attendance between 91 and 94%. Only a few participants had attendance below 50%, mainly because of personal reasons. The overall average attendance remained above 90%, demonstrating a high level of participation and interest throughout the 22-day training programme.

Academic Performance

A mid-term examination carrying 50 marks was conducted to evaluate participants' understanding of mushroom production technology. The assessment covered mushroom biology, substrate preparation, pasteurization, spawn inoculation, crop management, pest and disease management, harvesting and marketing. The majority of participants obtained scores between 30 and 42 marks. The highest score recorded was 42 out of 50, while several participants obtained scores of 40 or above. The results indicate satisfactory acquisition of theoretical knowledge during the training programme. Participants with lower scores were generally those who had comparatively lower attendance or exposure to the training sessions.

Practical Skill Development

Hands-on training was an important component of the programme. Participants were given opportunities to independently perform various mushroom cultivation operations under expert supervision.

The major skills acquired included:

- Selection and handling of quality spawn
- Preparation of paddy straw substrate
- Pasteurization of substrate

- Moisture management
- Spawn inoculation
- Bag filling and preparation
- Incubation and spawn-run management
- Humidity and ventilation management
- Fruiting management
- Harvesting
- Cleaning and grading
- Packaging
- Marketing and enterprise management

Practical exposure improved participants' confidence in carrying out mushroom production operations independently.

Participant Feedback

Feedback collected at the end of the programme revealed an overwhelmingly positive response from the participants. The major aspects appreciated by the trainees included:

- Quality of training
- Practical demonstrations
- Hands-on exposure
- Resource persons
- Learning materials
- Training facilities
- Technical guidance

Participants particularly appreciated the practical nature of the training. Several participants expressed interest in receiving advanced training related to mushroom processing, value addition, packaging and marketing.

Discussion

The findings demonstrate that skill-based training in mushroom cultivation can effectively promote livelihood diversification among rural and tribal communities. Participation of 47 beneficiaries from Kabirdham, Balaghat and Mandla districts indicates considerable interest in mushroom cultivation as an alternative income-generating enterprise. The participation of educated rural youth suggests potential for developing mushroom cultivation as a self-employment and entrepreneurship opportunity. The high representation of OBC and ST participants indicates successful outreach to socially disadvantaged and tribal communities. Mushroom cultivation is particularly suitable for remote areas because it requires limited land, can be practiced indoors and utilizes locally available agricultural residues such as paddy straw. This also promotes efficient recycling of farm waste into valuable food products. Average attendance exceeding 90% and satisfactory examination performance reflected strong participant engagement. Hands-on training improved practical skills in substrate preparation, pasteurization, spawn inoculation, incubation, crop management and harvesting. Positive feedback highlighted the importance of practical exposure. However, sustainable adoption requires quality spawn, technical support, financial assistance, input availability, market linkages and value-addition facilities. Overall, mushroom cultivation offers promising opportunities for employment generation, income diversification, women's participation and rural livelihood improvement.

Potential of Mushroom Cultivation as a Livelihood Enterprise

Mushroom cultivation offers several advantages for rural communities:

Low Land Requirement

Mushrooms can be cultivated in rooms, sheds and other protected structures, making the enterprise suitable for households with small landholdings.

Utilization of Agricultural Residues

Locally available materials such as paddy straw can be converted into a commercially valuable product, thereby reducing agricultural waste.

Short Production Cycle

Oyster mushroom production can provide harvestable produce within a relatively short period, allowing farmers to generate income more frequently than from many conventional crops.

Employment Generation

Mushroom cultivation can provide self-employment for rural youth, farmers and women and can be integrated with other agricultural activities.

Nutritional Security

Mushrooms provide proteins, vitamins, minerals and dietary fibre and can contribute to dietary diversification in rural households.

Scope for Value Addition

Fresh mushrooms can be processed into dried mushrooms, mushroom powder, pickles, soup mixes and other products, providing opportunities for additional income.

Women and Youth Entrepreneurship

Because the activity requires limited space and can be conducted near the household, mushroom cultivation offers considerable potential for women and rural youth entrepreneurship.

Recommendations for Sustainable Adoption

Based on the training experience, the following recommendations are proposed:

1. Beneficiaries should initially start mushroom cultivation on a small scale and gradually expand production after gaining experience.
2. Quality spawn should be procured only from reliable and recognized sources.
3. Proper sanitation and hygiene should be maintained throughout the production process.
4. Paddy straw and other substrates should be properly treated or pasteurized before inoculation.
5. Temperature, humidity, ventilation and moisture should be monitored regularly.
6. Production, expenditure, sales and profit records should be maintained.
7. Farmers should explore value addition and processing to reduce post-harvest losses.
8. Self-Help Groups (SHGs), Farmer Producer Groups (FPGs) and Farmer Producer Organizations (FPOs) can be promoted for collective production and marketing.
9. Market linkages should be developed with local consumers, hotels, restaurants, retailers and institutional buyers.
10. Regular follow-up training and technical support should be provided to newly trained beneficiaries.
11. Spent mushroom substrate can be utilized as organic manure or as a component of vermicomposting.
12. Successful trainees should be encouraged to act as local resource persons and motivate other rural households to adopt mushroom cultivation.

Conclusion

The 22-day Skill Development Training Programme conducted at Rengakhar Kalan, Bodla Block, Kabirdham district, successfully promoted mushroom cultivation as a potential livelihood option among rural and tribal communities.

A total of 47 participants from Kabirdham, Balaghat and Mandla districts participated in the programme. The substantial participation of socially disadvantaged communities and rural youth demonstrated the relevance of mushroom cultivation for inclusive livelihood development. The training provided participants with both theoretical knowledge and practical skills related to oyster mushroom production, including substrate preparation, pasteurization, spawn inoculation, incubation, crop management, harvesting, grading, packaging and marketing. The high average attendance of more than 90%, satisfactory mid-term examination performance and positive participant feedback demonstrated the effectiveness of the training methodology. Mushroom cultivation has considerable potential in remote villages because it requires limited land, can utilize locally available agricultural residues and offers opportunities for household-level production and value addition. It can contribute to income diversification,

employment generation, women's economic participation and nutritional security. However, successful long-term adoption will depend on continued technical support, availability of quality spawn, access to finance and inputs, market linkages, value-addition facilities and follow-up monitoring. The present intervention demonstrates that a combination of skill development, practical exposure, entrepreneurship training and post-training technical support can provide an effective model for promoting sustainable livelihood enterprises among rural and tribal communities.

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Conflict of Interest

The authors declare that there is no conflict of interest associated with the present study.

Data Availability Statement

The data presented in this article were compiled from participant registration records, attendance records, assessment results and feedback collected during the training programme. Relevant data may be made available by the authors upon reasonable request, subject to institutional requirements.

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