



Demonstration of Oyster Mushroom Cultivation and Production Technology: A Case Study of Jamgaon (M) Village, Durg District, Chhattisgarh

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Oyster mushroom (*Pleurotus* spp.) cultivation is a low-cost, eco-friendly, and income-generating enterprise that offers considerable potential for improving rural livelihoods. The present study was conducted under the National Service Scheme (NSS) in Jamgaon (M) Village, Durg District, Chhattisgarh, to demonstrate scientific oyster mushroom cultivation technology and assess its impact on farmers' awareness and income generation. A total of 35 beneficiaries, comprising 13 male and 22 female participants, were selected through random sampling. Practical demonstrations and awareness programmes were conducted using paddy straw as the cultivation substrate. The demonstration employed 10 production units with 5 kg of spawn and 50 kg of paddy straw, resulting in a total production of 55 kg of fresh oyster mushrooms within a 30-day cultivation cycle. The crop exhibited a spawn run period of 14–18 days, a biological efficiency of 85%, an average yield of 0.85 kg per kilogram of dry straw, and 3–4 harvest flushes, which were within the recommended standards. The economic analysis indicated a total production cost of ₹1,300, a gross return of ₹5,040, a net profit of ₹3,740, and a benefit-cost ratio of 2.88, confirming the economic viability of oyster mushroom cultivation. The study also revealed a significant improvement in participants' knowledge regarding scientific cultivation practices, nutritional importance, and entrepreneurship opportunities. The findings demonstrate that oyster mushroom cultivation is a sustainable, environmentally friendly, and profitable enterprise capable of enhancing rural employment, women's participation, and farmers' income. Continued technical support, regular training, and improved market linkages are recommended to promote wider adoption of this technology.

Keywords: Oyster mushroom, *Pleurotus florida*, Mushroom cultivation, National Service Scheme (NSS), Demonstration, Rural livelihood, Paddy straw, biological efficiency, Entrepreneurship, Chhattisgarh.

Introduction

National Service Scheme (NSS) aims at personality development through community service. Mushroom cultivation, especially oyster mushroom (*Pleurotus* spp.), is a low-investment, high-return agribusiness suitable for rural youth, women, and marginal farmers. It utilizes agricultural waste (paddy straw) and provides nutrition, income, and environmental benefits by reducing stubble burning. Jamgaon (M) in Patan block, Durg district, Chhattisgarh, is predominantly agrarian with abundant paddy straw. The village has potential for diversification through processing units and allied activities. This NSS demonstration project introduced oyster mushroom technology to promote self-employment and sustainable livelihood.

Oyster mushrooms (primarily *Pleurotus* species such as *P. ostreatus*, *P. sajor-caju*, *P. florida*, pink/blue/golden varieties) are edible fungi known for their oyster- or fan-shaped caps. They grow on lignocellulosic substrates like paddy straw, wheat straw, or bagasse. Production refers to the cultivation process: substrate preparation (chopping, pasteurization), spawning (inoculation with mycelium), incubation (spawn run in dark conditions), and fruiting under controlled humidity (80–90%), temperature (20–28°C ideal), and ventilation. It is a fast cycle (25–45 days to first harvest, 3–4 flushes per bag) and beginner-friendly, requiring low investment and no complex composting (unlike button mushrooms).

Objectives of the study: The objectives of the study are

- 1 To demonstrate scientific oyster mushroom cultivation.
- 2 To create awareness about nutritional benefits.
- 3 To generate self-employment opportunities.
- 4 To increase farmers' income through mushroom production.
- 5 To encourage women and youth entrepreneurship.
- 6 To create awareness about economic benefits.

Methodology

Study area and sample respondents: The study was conducted in the month of March 2026. Using the 2011 Census data, 75 rural families were randomly selected from Jamgaon (m) Village Durg District of Chhattisgarh. One adult respondent from each household was randomly selected for the study.

Enquiry areas and research instrument: Interview schedule was prepared and pretested before canvassing in the field. Every individual participating in the study was explained the purpose of the study in Chhattisgarhi and Hindi. During the administering of the questionnaire the consent was taken from all the identified individuals. The selected respondents were asked a set of questions from the semi structured questionnaire and filled a survey preform through personal interview in Chhattisgarhi and Hindi as they all were familiar with this language. All the individuals were assessed for the inclusion and exclusion criteria. Inclusion criteria include the adult males and females of any age group and permanent resident of the selected areas. Two percent of the women's respondents did not participate due to their shy nature and therefore were excluded from the study

Area	Total Households	Number of Respondents	
		Male	Female
Jamgaon-M village District- Durg (C.G.)	35	13	22

Method of Oyster Mushroom Production

Materials

- 1 Paddy straw
- 2 Mushroom spawn (*Pleurotus florida*, White Oyster)
- 3 Polythene bags
- 4 Bleaching powder
- 5 Formalin and Carbendazim
- 6 Water
- 7 Plastic rope
- 8 Sprayer

Methodology

1. Baseline survey
2. Selection of beneficiaries
3. Awareness programme
4. Practical demonstration



Demonstration Procedure

Take **paddy or wheat straw** (dry and clean).

↓

Cut the straw into **3–5 cm** pieces.

↓

Soak the chopped straw in clean water containing the following: **Formalin** should be added at a rate of 125 ml per 100 liters of water, and **Carbendazim (Bavistin)** should be added at a rate of 7.5 g per 100 liters of water. Keep the straw immersed for **12–18 hours**.

Or

Hot water treatment for sterilization

↓

Remove the straw and drain excess water for **2–4 hours** until the moisture content reaches **65–70%**.

↓

Put 2-3 inches of straw at the bottom of the plastic bag, then layer spawn and straw alternately for **4-6 layers**.

↓

Tie the mouth of the bag tightly.

↓

Make **10–15 small holes (1–2 cm)** around the bag for aeration.

↓

Keep the bags in a clean incubation room at **22–28°C**.

↓

After **18–20 days**, when the **mycelium completely** covers the straw, remove the polythene bag and transfer the mushroom block to the cropping room.

↓

Maintain **80–90% relative humidity** by spraying clean water **2–3 times daily**.

↓

Mushrooms become ready for harvesting in **3–5 days** after shifting to the cropping room.

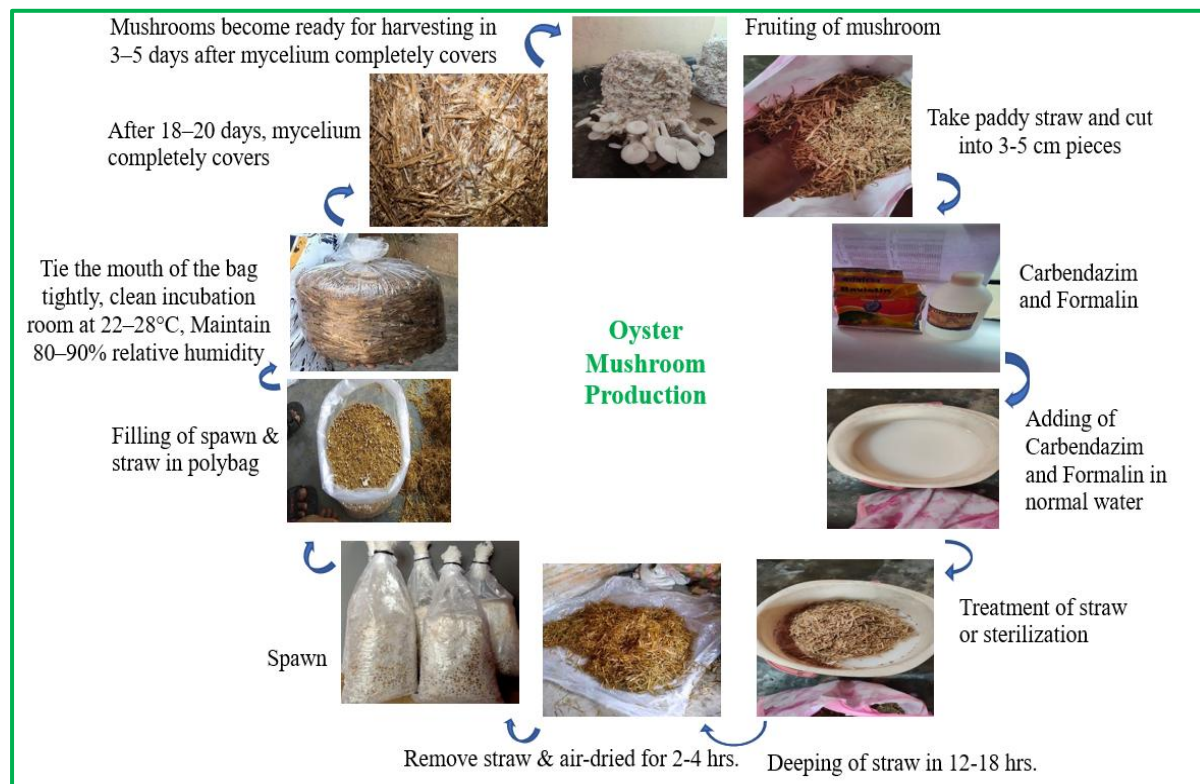


Figure 1. Procedure of Oyster Mushroom Production

Result and Discussion

The demonstration of oyster mushroom cultivation using paddy straw as substrate yielded encouraging results. The average spawn run period was recorded as 14–18 days, which is within the standard range recommended by ICAR-Directorate of Mushroom Research. Full colonization success rate was 92%, indicating good quality spawn and proper pasteurization technique. The mean biological efficiency achieved was 85% (0.85 kg fresh mushroom per kg dry straw). This is comparable to the findings of Vijayakumar *et al.* (2015) and Pandey (2018). The average number of flushes per bag was 3.4, with the first flush giving the highest yield.

Table 1. Beneficiary Details, Demonstration Particulars and Yield Performance.

Particulars / Parameters	Observed Value	Male	Female	ICAR Standard
Total Participants	35	13	22	-
Aware of Oyster Mushroom Cultivation	24	9	15	-
Not Aware of Oyster Mushroom Cultivation	11	4	7	-
Demonstration Units	10	-	-	-
Spawn Used	5 kg	-	-	-
Paddy Straw Used	50 kg	-	-	-
Total Mushroom Production	55 kg	-	-	-
Duration of Demonstration	30 Days	-	-	-
Spawn Run Period	14–18 days	-	-	12–20 days
Biological Efficiency	85%	-	-	80–120%
Average Yield (per kg dry straw)	0.85 kg	-	-	0.8–1.2 kg
Number of Flushes	3–4	-	-	3–5

A total of 35 beneficiaries (13 males and 22 females) participated in the oyster mushroom cultivation demonstration. Among them, 24 participants were already aware of oyster mushroom cultivation, while 11 participants had no prior knowledge. The demonstration was conducted using 10 production units, with 5 kg of spawn and 50 kg of paddy straw, producing 55 kg of fresh oyster mushrooms within 30 days. Oyster mushroom is a highly nutritious food containing 3.3 g protein, 5.0 g carbohydrates, 0.4 g fat, and 2.3 g dietary fibre per 100 g of fresh mushroom. It is also a good source of Vitamin B-complex and essential minerals such as potassium, iron, and phosphorus. Its low-calorie content (33 kcal) makes it a healthy food suitable for all age groups.

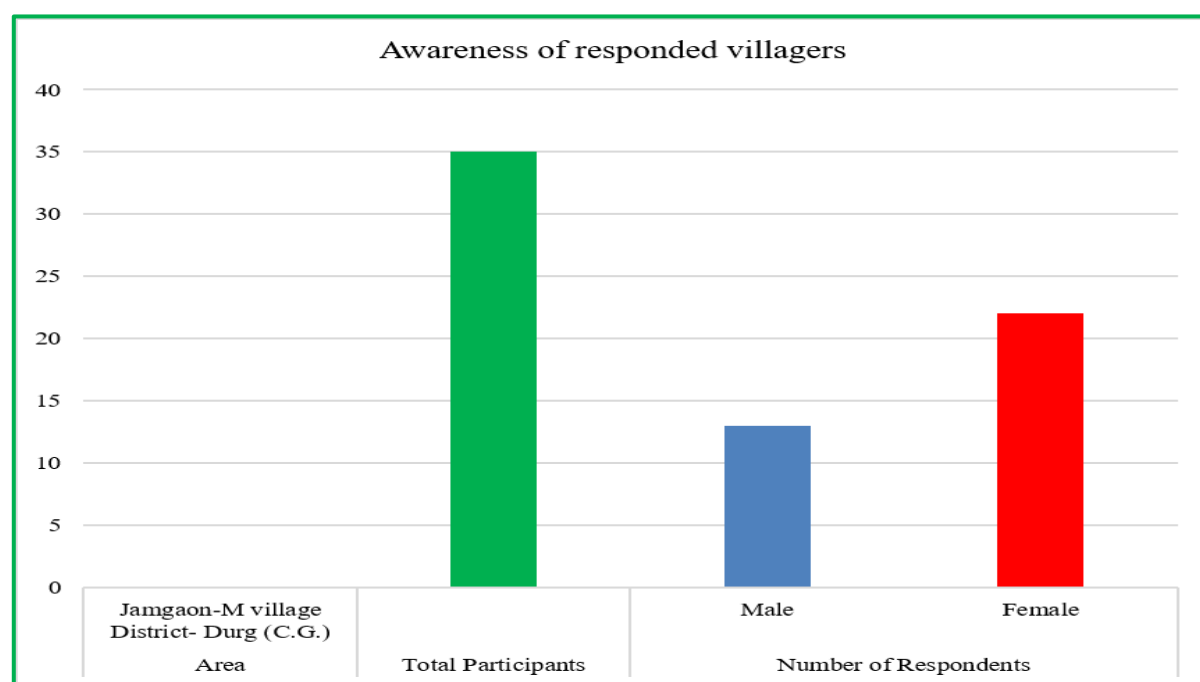


Fig 2. Awareness of responded villagers

Table 2. Nutritional Value (100 g Fresh Mushroom)

Component	Amount
Protein	3.3 g
Carbohydrates	5.0 g
Fat	0.4 g
Fibre	2.3 g
Calories	33 kcal
Vitamin B Complex	Present
Minerals	Potassium, Iron, Phosphorus



Table 3. List of responded villagers

S. No.	Beneficiaries	Age	Contact no.
01	Tukaram Sinha	37	9406068233
02	Pushpa Sinha	35	-
03	Pushpa Sinha	38	-
04	Babli Sinha	41	-
05	Trivedi Chandrakar	48	-
06	Sarojni Sinha	27	-
07	Savitri Sinha	45	-
08	Sangeeta Sen	30	-
09	Durgesh Sen	35	-
10	Jitendra Sen	40	-
11	Gangaray Sinha	66	-
12	Basant Kumar	28	-
13	Babita Yadav	31	-
14	Kushboo Yadav	28	-
15	Amar bai jogi	54	-
16	Krunal Verma	19	-
17	Bupendra kumar dewangan	34	-
18	Sonam Yadav	30	-
19	Radheshayam Yadav	35	-
20	Bimla Kumahar	50	-
21	Ashok Yadav	51	-
22	Parvati bai dewangan	40	-
23	Reshma Dewangan	38	-
24	Sarita Sharma	49	-
25	Hariram Yadav	26	-
26	Niklesh Thakur	37	-
27	Geeta Yadav	46	-
28	Basanti Bai	48	-
29	Nohar Yadav	28	-
30	Komal Verma	41	-
31	Manjula Verma	47	-
32	Kushum Verma	37	-
33	Aarti Dewangan	38	-
34	Sukhanti Bai	44	-
35	Suman Yadav	30	-

This economic return clearly demonstrates the viability of oyster mushroom cultivation as a supplementary income source for rural families, especially women self-help groups. The demonstration generated considerable interest among villagers. Participants learned scientific cultivation techniques and understood the economic potential of mushroom farming. Women actively participated and expressed willingness to adopt mushroom cultivation as an income-generating activity. Average biological efficiency ranged between 80–100%. Income generated from one production cycle was satisfactory, demonstrating that oyster mushroom cultivation can supplement farm income.

Table 4. Economic Analysis (Per 50 kg Dry Straw Batch)

Parameter	Value (₹)
Total Cost of Production	1,300
Gross Return (42 kg @ ₹120/kg)	5,040
Net Profit	3,740
Benefit-Cost Ratio	2.88

A batch of 50 kg dry straw produced approximately 42 kg fresh mushrooms. The total cost of production was ₹1,300, while the gross return at the prevailing market rate of ₹120 per kg was ₹5,040. Thus, the net profit per batch was ₹3,740 with a Benefit-Cost Ratio (BCR) of 2.88.

Conclusion

The NSS demonstration programme successfully enhanced awareness regarding oyster mushroom cultivation in Jamgao (M) village. Farmers acquired practical knowledge on scientific production technology, substrate preparation, spawning, crop management, harvesting, and marketing. Oyster mushroom cultivation proved to be a profitable, sustainable, and environmentally friendly enterprise capable of generating additional income and employment opportunities for rural households. Continuous technical guidance and institutional support will further increase adoption and improve rural livelihoods.

Suggestions

- Establish local spawn production units.
- Conduct regular farmer training programmes.
- Improve market linkages.
- Provide financial assistance through government schemes.

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