



# Impact Analysis of the Mushroom Cultivation Training and Demonstrations Programme in the Old Alluvial Zone of West Bengal, India

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

Edible mushrooms are part of a delicious and nutrient-dense vegetarian diet. KVK Malda conducted front-line demonstrations and trainings to evaluate the profitability of oyster mushroom production from 2020 to 2022. It is found from the study that the benefit-cost ratio of oyster mushroom cultivation was significant, and the majority of the respondents participated in a mushroom cultivation training program to learn about mushroom growing techniques for self-consumption and become entrepreneurs. It was found from the study that the majority of the respondents were able to identify edible and wild mushrooms, and they used the bi-product of mushrooms for compost production. It is also found from the study that the majority of the farmers in the old alluvial zone discontinued mushroom cultivation due to a lack of marketing facilities.

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## 1. INTRODUCTION

The cultivation of mushrooms is now gaining popularity worldwide. Through contributions to nutrition, medicine, and the economy, mushroom cultivation can directly improve livelihoods. The technology for growing mushrooms is inexpensive. Mushrooms being an indoor harvest required exceptionally little space and no need for an exorbitant foundation. At the time of fruiting, it needs controlled temperatures between 14 and 19 degrees Celsius and 85 percent humidity. Oyster mushrooms are grown on material that has been prepared by combining the spawn with wheat or paddy straw. A mushroom is a fungal growth that typically has gills on the underside of its domed cap that is attached to a stalk. Mushrooms, also known as “white vegetables” or “boneless vegetarian meat,” are high in fibre, vitamins, proteins and essential minerals [1, 2]. During the growing season, a Krishi Vigyan Kendra of Malda conducted practical training in mushroom cultivation because mushroom is a good source of nutrition and can also be used to alleviate youth poverty. Even though researchers and extension agents highly recommend it, business owners face a number of obstacles to implementing it. Mushrooms and fleshy fungi are a delicious and nutrient-dense vegetarian diet. According to Rana et al.[3], because mushrooms are high in protein, minerals, vitamins, and low in calories, they are considered a nutritious and therapeutic food. However, if used in mushroom cultivation, crop residue can contribute to integrated rural development by increasing income and self-employment [4]. Farmers receive little economic return from crop residue. According to Guillamón et al. [5], edible mushrooms contribute to the commercial trade of numerous agro- and forest-based businesses and are well-known for their nutritional and medicinal properties. The promotion of mushroom cultivation could alleviate land-use pressure, improve food and nutritional security, and elevate women’s status by allowing them to earn additional income and participate in household decision-making [6]. In developing nations, rural development primarily aims to diversify rural income and establish a competitive agricultural structure to increase employment opportunities and development [7]. Through the production of a fast-producing, nutritious food source and a dependable income, mushroom cultivation can help alleviate poverty and

strengthen livelihoods [8]. Mushrooms, however delegated as vegetables in the food world, are not, in fact, plants [9]. They are members of the Kingdom of Fungi. Apetorgbor et al.[10] and Shahi et al.[11] had previously observed that the local market was primarily where mushrooms were sold, and the results above support this assertion. Nagraj et al.[12] and Arora RK [13, 14] found that professional training had extended the information on farmers, farm women, and rural youth in regards to all the subcomponents of mushroom cultivation.. However, it is absolutely necessary to investigate the costs and benefits of mushroom production. This is deemed crucial for the development and formulation of sound economic incentives for mushroom production. Mushroom business is more beneficial than some other farming business because the pay is expressed in a brief time frame of 45 to 50 days after sowing. The Malda district’s agricultural climate is ideal for oyster mushroom production for eight to nine months, from the second week of June to the first week of March. Rural youth believe that mushroom production can be a low-cost, home-based business with minimal effort. The adoption of mushroom production as a means of earning money by resource-poor farm families increased significantly as a result of technological innovation. Along with nutritional security, the resource-poor farmer’s socioeconomic conditions are improved. It is gaining popularity among farmers without land because it requires fewer infrastructures and is less expensive. The front-line demonstration and training program for mushroom cultivation conducted by Malda Krishi Vigyan Kendra, Ratua, play a significant role in promoting mushroom production. After receiving the necessary skills and knowledge, the trained workers began producing it. A lot of other farmers, farm women, and rural youth, in addition to the trained trainees, began cultivating it after observing their neighbors and fellow farmers in nearby villages. The purpose of this study was to determine the impact of frontline demonstration and mushroom cultivation training on the trained participants.

## 2. MATERIALS AND METHODS

The study was conducted with the front-line demonstrations and training program of mushroom cultivation under Malda Krishi Vigyan Kendra, Uttar Banga Krishi Viswavidyalaya, from 2020 to 2022. Both purposive and simple random

sampling methods were used to select the sample respondents. The district of Malda was chosen purposefully. Ratua 1 and Ratua 2 blocks under Malda District were chosen purposefully because they were pre-selected for Malda KVK interventions. Villages Balupur from the Ratua 1 Block and Rajapur from the Ratua 2 Block were chosen purposefully. 20 farmers from each village were randomly selected. The total sample size of the study is 40. The responses from the respondents were collected through a pre-tested interview schedule.

### 3. RESULTS AND DISCUSSION

It is found from the study that the benefit-cost ratio of mushroom cultivation was 3.33, which is significant, and the cost of cultivation of 25 bags of oyster mushrooms was only Rs. 750.00.

It is found from the study (Table 2) that the majority of the respondents (32.5%) participated in the training program to learn about mushroom growing techniques for self-consumption, followed by adopting mushroom production as an enterprise (27.5%), getting a certificate of vocational training course for financial assistance (20%), and taking mushroom cultivation as a secondary income generation activity using locally available resources, i.e., paddy straw, wheat husk, etc. (20%).

It is found from the study (Table 3) that the major impact of the training program on mushroom cultivation was to increase the knowledge and skills of the respondents in the identification of edible and wild mushrooms (80%), followed by the use of mushroom products as compost

(75%), good scientific knowledge in the management of pests and diseases in mushroom (70%), use of locally available resources for the production of different species of mushroom (67.5%), and value addition and sale of dry mushrooms (62.5%).

**Table 1. Cost of cultivation of oyster mushroom**

Cost of cultivation (Rs)	750/-per 25 bags
Days of first picking	35
No. of pickings	03
Production per bag	1 kg
Market rate (Rs/kg)	100
Gross return (Rs./family, 50 bags and one crop of winter season)	2500
Net return (Rs./family)	1750
benefit cost ratio	3.33

It is shown from the study (Table 4) that the major constraints faced by the respondents were lack of marketing facility (92.5%), followed by lack of government subsidy (90%), problem of perishability of the product (85%), non-availability of spawn in time (82.5%), non-possession of technical knowledge (80%), lack of flow of information (75%), lack of availability of spawn. (72.5%), and lack of technical guidance (67.50%).

It is shown from the study (Table 5) that the majority of the respondents suggestions to overcome the mushroom cultivation constraints were to improve the marketing facility by the

**Table2. Reasons for participation in vocational training programme on mushroom cultivation (n= 40)**

Sl.No.	Reasons	Frequency	Percentage
1.	To learn about mushroom growing techniques for self-consumption	13	32.5
2.	To get certificate of vocational training course for financial assistance	8	20
3.	To adopt mushroom production as an enterprise	11	27.5
4.	As a secondary income generation activity using locally available resources i.e. paddy straw, wheat husk etc.	8	20

**Table 3. Impact of training programme on mushroom cultivation (n= 40)**

Sl. No.	Knowledge and skill	Frequency	Percentage
1.	Identification of edible and wild mushroom.	32	80
2.	Use of locally available resources for production of different species of mushroom	27	67.5

Sl. No.	Knowledge and skill	Frequency	Percentage
3.	Bi-product of mushroom cultivation are used as compost making	30	75
4.	Good scientific knowledge in management of pest and disease in mushroom	28	70
5.	Value addition in mushroom/ sell of dry mushroom.	25	62.5

**Table4. Constraints expressed by respondents (n = 40)**

Constraints	Frequency	Percentage	Rank
Non possession of technical knowledge	32	80	V
Lack of flow of information	30	75	VI
Lack of technical guidance	27	67.5	VIII
Lack of marketing facility	37	92.5	I
Non-availability of spawn in time	33	82.5	IV
Highly perishable	34	85	III
Lack of availability of Spawn.	29	72.5	VII
Lack of govt. subsidy	36	90	II

**Table5. Suggestion of the respondents to overcome the constraints (n= 40)**

Sl.No.	Suggestion	Frequency	Percentage
1.	Technical guidance through skill training	28	70
2.	Improve the Marketing facility by govt. department	39	97.5
3.	Supply of timely information	30	75
4.	Availability of loan and subsidy from Bank	36	90
5.	Cost of spawn may be reduced	32	80
6.	Post-harvest storage facility	38	95
7.	Availability of quality spawn	27	67.5

government department (97.50%), followed by the post-harvest storage facility (90%), the availability of loans and subsidies from the bank (90%), the reduction of the cost of spawn (80%), the supply of timely information (75%), technical guidance through skill training (70%), and the availability of quality spawn (67.5%).

**Table 6. Adoption of mushroom cultivation for income generation (n= 40)**

Mushroom Cultivation	Frequency	Percentage
Adoption	6	15
Discontinuance	34	85

It is found from Table 6 that 15% of the total participants adopted mushroom cultivation as their secondary income generation activity, while 85% of the participants discontinued taking it as an income generation activity. A secondary survey was conducted to determine the reason for the discontinuation of mushroom production. It is found from the survey that the major reason for the discontinuance of mushroom cultivation was the food habits of the local people are different; they cannot take it as food while the

nutritive value of mushrooms is high; the non-availability of spawn and other input in all rounds of the year; and the marketing of mushrooms is another problem.

#### 4. CONCLUSION

It is concluded from the study that the benefit-cost ratio of oyster mushroom cultivation was significant, and the majority of the respondents participated in mushroom cultivation training to learn about edible mushroom growing techniques for self-consumption and become entrepreneurs in mushroom cultivation. It was shown from the study that after the training program, the majority of the respondents were able to identify edible and wild mushrooms, and they used the bi-products of mushrooms as compost. The majority of the respondents discontinued mushroom cultivation due to a lack of marketing facilities. It is recommended from the study that there is a need for marketing intervention for mushrooms from the government, private companies, start-ups, or FPCs due to the greater demand in the nearest countries, Bhutan and Nepal.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Sharma A, Sharma J, Thakrele P. Screening, Localization and Activity of Mushroom Tyrosinase from Various Developmental Growth Phases of *Pleurotus florida*. Int. J. Curr. Microbiol. App. Sci. 2016;5(1):565-575. Available: <http://dx.doi.org/10.20546/ijcmas.2016.501.058>
2. Atipko M, Onokpise O, Abazinge A, Awumbilla B. Utilizing Seafood waste for the production of mushrooms. Proceedings of the Florida academy of Sciences. FAS Abstracts 2006 Meeting. Agric. Sci. (AGR): AGR-10; 2006.
3. Rana RS, Bhatia JN, Madan RL, Goel SP, Pawar MS. Khumb Utpadan: Labhkari Vyavsaay, Bulletin No. (23), Directorate of Extension Education, Chaudhary Charan Singh Hariyana Krishi Vishwa Vidhyalaya, Hissar. 2007; 1-34.
4. Sharma RK, Yadav R. Popularising mushroom production in rural areas, Indian Farming. 2008;58(3):27-29
5. Guillamón E, García-Lafuente A, Lozano M, D'Arrigo M, Rostagno MA, Villares A, Martínez JA. Edible mushrooms: Role in the prevention of cardiovascular diseases. Fitoterapia. 2010;81(7):715-23. DOI: 10.1016/j.fitote.2010.06.005 Epub 2010 Jun 13. PMID: 20550954.
6. Manju Varma SK, Rani S. Impact assessment of mushroom production for rural women. Raj. J Ext. Edu. 2012;20: 78-80.
7. Sharma S, Yadav PR, Pokhrel PC. Growth and yield of oyster Mushroom (*Pleurotus ostreatus*) on different substrates. J New Biol Rep. 2013;2:3-8.
8. Rachna Goel, Sodhi, R. GPS. Evaluation of vocational training programme organized on mushroom farming by Krishi Vigyan Kendra, Patiala. Jr. Krishi Vigyan. 2013;2:26-29.
9. Megan Ware RDNLD. Mushrooms: Nutritional Value and health benefits, MNT, Reviewed by Peggy Pletcher, MS, RD. LD.CDE [googleweblight.com](http://googleweblight.com); 2017.
10. Apetorgbor MM, Apetorgbor AK, Nutakor E. Utilization and cultivation of Edible mushrooms for rural livelihood in Southern Ghana. Commonwealth forestry conference, Colombo, Sri Lanka; 2005.
11. Shahi V, Shahi B, Kumar V, Singh K, Kumari P. Impact study on mushroom Cultivation for micro entrepreneurship development and women Empowerment. International Conference on Food Security and Sustainable Agriculture, Thailand; 2018.
12. Nagaraj R, Arunkumar P, Hanumanthaswamy BC, Rathod Jyoti M. Mushroom Production for Self Employment – An Impact Study. Int. J. Curr. Microbiol. App. Sci. 2017;6(9):2991-2997
13. Arora B, Kamal S, Sharma VP. Sensory, nutritional and quality attributes of Sponge cake supplemented with mushroom (*Agaricus bisporus*) powder. Nutrition & Food Science. 2017;47 (4):578-590. Available: <http://dx.doi.org/10.1108/NFS-12-2016-0187>.
14. Majumder D, Das PK, Gogoi R. Adoption of Recommended mushroom production technology and strategies for developing mushroom industry in Assam. Mushroom Research. 2009;18 (2):83-90.

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