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Economic analysis of mushroom production in Chandrapur district of Maharashtra

¹Kumare NM, ²More SS, ¹Ghule KS, ¹Zine PS and ¹Kulkarni SH

¹M.Sc. Scholar, Department of Agricultural Economics, College of Agriculture, Parbhani, Vasantao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra India

²Associate Professor, College of Agriculture, Parbhani, Vasantao Naik Marathwada Krishi Vidyapeeth, Parbhani Maharashtra India

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Corresponding Author: Kumare NM

Abstract

Mushrooms are the fruiting bodies of macro fungi. Today there are many species of mushrooms they are cultivated for edible, medicinal use and many nutritive value. China was the largest producer of mushrooms in the world in 2020. India has tremendous potential for mushroom production and all commercial edible and medicinal mushrooms can be grown. *Pleurotus* spp. (Oyster mushroom): It is one of the species of mushroom which is commonly cultivated in India known as Dhingri is an important edible mushroom gaining popularity in recent years because of its high nutritional value and ability to grow on diverse agricultural wastes. A sample of 60 respondents was selected randomly. They were categorized on the basis of numbers of beds into small, medium and large respondents selected for the oyster mushroom growers of Chandrapur district and from near Nagpur district was also included. Primary data was collected by personal interview method with the help of pre-test well prepared interview schedule for the year 2021-2022.

Keywords: Mushroom, economics, costs, returns, B-C ratio etc.

Introduction

Mushrooms are the fruiting bodies of macro fungi. Today there are many species of mushrooms they are cultivated for edible, medicinal and many nutritive value. Food and Agricultural Organization reported that global mushroom production 20 together countries 93,879,022,609 pounds in the year 2020. China was the largest producer of mushrooms in the world in 2020 contributing 88 billion pounds and accounting 94 per cent of mushroom production followed by Japan contributes 1,040 billion pounds and accounting 1.11 per cent and United States contributes 816 billion pounds, accounting 0.87 per cent of the world production. India has tremendous potential for mushroom production and all commercial edible and medicinal mushrooms can be grown. There is increasing demand for quality products at competitive rate both in domestic and export market. Though growth of mushroom will depend on increasing and widening domestic market in coming years, export market will be equally attractive. *Pleurotus* spp. (Oyster mushroom): It is commonly known as Dhingri is an important edible mushroom gaining popularity in recent years because of its high nutritional value and ability to grow on diverse agricultural wastes. Mushroom is not a vegetable, but it usually uses a vegetable form. It is a rich source of vitamins and proteins, natural antibiotics, low calorie, and carbohydrate foods. 1 cup of raw mushroom contains only 15 calories and 2.3 grams of carbohydrate. Mushroom 85-95 per cent water, 3 per cent protein, 4 per cent carbohydrate, 0.1 per cent fat, 1% mineral and vitamin

(Rahman, 2018) ^[3]. Mushrooms contain sufficient amount of potassium, phosphorus, copper and iron but low levels of calcium mushrooms.

Methodology

The GBS mushroom and agribusiness Pvt. Ltd. GBS Chandrapur is working to promote mushroom production by providing training to rural youth, landless women, etc. they have popularized this agribusiness in the district. The company has provided training which has help to settle various mushroom production unit in the district. A sample of 60 respondents was selected randomly. They were categorized on the basis of numbers of beds into small (up to 100-120 beds), medium (120-300 beds) and large (more than 300 beds) respondents selected for the oyster mushroom growers of Chandrapur district and from near Nagpur district was also included. Primary data was collected from the sample oyster mushroom growers, rural vendors through interview method and personal interview method with the help of pre-test well prepared interview schedule for the year 2021-2022.

Results and Discussion

1. Investment on equipment in mushroom production unit

The final production of any venture is mainly governed by an investment of capital. In this section an attempt was made to examine capital investment in various materials used in mushroom production units in study area. Capital

investment in mushroom production units is given in table 4.10 the expenditure on hangers/racks/ropes for growing production was important items of investment i.e. in small category Rs 5076.00, medium Rs 6993.47, large category Rs 10536.60 and overall that was Rs 22606.10 per unit, it is increased with increases the size of units. Then second important component was sprayer pump/foggers I e. in small category Rs 1324.48, medium Rs 3381.54, large category Rs 5067.12 and overall that was Rs 9773.14per unit and motor occupies i.e. in small category Rs15600.50, medium Rs 16993.90, large category Rs 42658.00 and overall that was Rs 75252.50per unit. The average establishment cost for large grower category maximum, it was mainly because of more use of thermo-hygrometer, air conditioner, pump, exhaust fan, etc. The overall average total establishment cost was in small category Rs 58545.80, medium Rs 16993.90, large category Rs 153578.00 and overall that was Rs 298246.00 per unit respectively.

The expenditure on refrigerator i.e. in small category Rs 7817.21, medium Rs 15855.21, large category Rs 26071.90 and overall that was Rs 49744.30 per unit, expenditure on desert cooler that was in small category Rs 5739.84,

medium Rs 7165.44, large category Rs 11303.20 and overall that was Rs 24208.50 per unit. The expenditure on chaff cutter that was in small category Rs 14575.50, medium Rs 17409.62, large category Rs 22796.40 and overall that was Rs 54781.60 per unit. The expenditure on exhaust fan that was in medium Rs 1560.25, large category Rs 10768.70 and overall that was Rs 12328.90per unit. The investment on weighing balance that was in small category Rs 1379.04, medium Rs1710.84, large category Rs 2942.75 and overall that was Rs 6032.63per unit. The expenditure on straw immersion tank that was in small Rs 1096.42, medium Rs 3381.54, large category Rs 5067.12 and overall that was Rs 9773.14per unit, The expenditure on thermo-hygrometer that was in small 1237.56, medium Rs 1895.03, large category Rs 2289.32 and overall that was Rs 5421.91per unit, measuring tape that was in small 130.10, medium Rs 133.80, large category Rs 264.65 and overall that was Rs 528.55per unit, The investment on buckets in small Rs 4516.51, medium Rs 8664.23, large category Rs 11158.20 and overall that was Rs 24339.00per unit and gunny bag that was in small 52.20, medium Rs 112.16, large category Rs 153.76 and overall that was Rs 318.52 per unit, respectively.

Table 1: Investment on equipment in mushroom production unit

Sr. No.	Equipments	Investment on equipments (Rs)			
		Small	Medium	Large	Overall
1	Hangers/racks/Ropes	5076.00 (8.67)	6993.47 (8.12)	10536.60 (6.86)	22606.10 (7.57)
2	Gunny bag	52.60 (52.6)	112.16 (0.13)	153.76 (0.10)	318.52 (0.10)
3	Bucket	4516.51 (7.71)	8664.23 (10.06)	11158.20 (7.26)	24339.00 (8.16)
4	Measuring tape	130.10 (0.22)	133.80 (0.15)	264.65 (0.17)	528.55 (0.17)
5	Exhaust fan	-	1560.25 (1.81)	10768.70 (7.01)	12328.90 (4.13)
6	Desert cooler	5739.84 (9.80)	7165.44 (8.32)	11303.20 (7.35)	24208.50 (8.11)
7	Thermo-hygrometer	1237.56 (2.11)	1895.03 (2.20)	2289.32 (1.49)	5421.91 (1.81)
8	Refrigerator	7817.21 (13.35)	15855.21 (18.41)	26071.90 (16.97)	49744.30 (16.67)
9	Straw immersion tank	1096.42 (1.87)	4247.01 (4.93)	7567.24 (4.92)	12910.70 (4.32)
10	Sprayer pump/foggers	1324.48 (2.26)	3381.54 (3.92)	5067.12 (3.29)	9773.14 (3.27)
11	Chaff cutter	14575.50 (24.89)	17409.62 (20.21)	22796.40 (14.84)	54781.60 (18.36)
12	Weighing balance	1379.04 (2.35)	1710.84 (1.98)	2942.75 (1.91)	6032.63 (2.02)
13	Motor	15600.50 (26.64)	16993.90(19.73)	42658.00 (27.77)	75252.50 (25.23)
	Total	58545.80 (100)	86122.50 (100)	153578.00 (100)	298246.00 (100)

Further, analysis of capital investment showed that, there was a direct and positive relationship between the size of mushroom production unit and capital expenditure. There was a significant variation in capital investment on small sized units as compared to medium and large sized units. This indicates that with increase in the size of the production unit, capital expenditure also increases.

2. Cost and returns of oyster mushroom production

The cost of oyster mushroom production and returns analysis of the mushroom production helps the grower in getting better results hence to achieve the second objective of the study the cost and returns analysis has been work out and result were reported in table 2.

Table 2 revealed that the overall per unit establishment cost viz., land, building construction and depreciation on assets was Rs 363486. Whereas the maximum in the large size unit Rs 195232 and the minimum in the small size unit 45391.49 per unit and medium size that was Rs 122862.93 per unit,

respectively. In which overall establishment cost on land is Rs 156.84, building construction cost was Rs 294560, respectively.

The expenditure incurred on straw material, spawn, polythene, flour, disinfectants, miscellaneous items, etc. on a per unit basis was reported in table 2. The cost of all these items was lower in small units (Rs 48379.65) and higher in large (Rs 192812) per unit. The total cost of production was Rs 93771.41, Rs 236142.47 and Rs 192812 on small, medium and large units. In which overall establishment cost of straw that was Rs 22877.40, cost of spawn that was Rs 57780, cost of gram flour that was Rs 2550, cost of polythene bags that was Rs 30316.50, cost of carbendazim that was Rs 4544.80, cost of formaldehyde that was Rs 12916.50, gas charges Rs 1328.50, labor cost that was Rs 176880 and miscellaneous Rs 13053, respectively.

In regards to returns generated from oyster mushroom production it could be seen from the table 2 that, per unit per annum the total income generation from main produce i.e.

oyster mushroom was maximum found in group of large growers to be Rs 998100 and minimum in small group that was Rs 140341.50 and from mushroom by product i.e. manure it was maximum from large group Rs 22371 and minimum from small group Rs 3516. The gross returns estimated that was maximum in large units Rs 1020471 and minimum in small unit Rs 143857.50. The net returns estimated that was maximum in large units Rs 632427 and

minimum in small unit Rs 50086.36 per unit with benefit-cost ratio 1.53, 1.88 and 2.62 from small, medium and large category respectively.

Sachan and Kumar (2020) [8] analyzed the production cost ranges from Rs67568 to Rs 241932 among various categories of farms showing affirmative association between cost and farm size.

Table 2: Cost and returns of oyster mushroom production (Rs per Unit/ 6 batch)

Sr. No.	Material	Categories			
A	Fixed cost	Small	Medium	Large	Overall
1	Land	23.54 (0.02)	46.80 (0.01)	86.50 (0.02)	156.84 (0.02)
2	Building construction	34650.00 (36.95)	101040.00 (42.78)	158870.00 (40.94)	294560.00 (46.88)
3	Depreciation on equipments	5854.58 (6.24)	8612.25 (3.64)	15357.80 (3.95)	29824.60 (4.74)
4	Interest on fixed cost 12%	4863.37 (5.18)	13163.88 (5.57)	20917.70 (5.39)	38944.90 (6.19)
	Total fixed cost	45391.49 (48.40)	122862.93 (52.02)	195232.00 (50.31)	363486.00 (57.85)
B	Variable cost				
6	Cost of straw	2931.00 (3.12)	6761.40 (2.86)	13185.00 (3.39)	22877.4 (3.64)
7	Cost of spawn	10740.00 (11.45)	18300.00 (7.74)	28740.00 (7.40)	57780.00 (9.19)
8	Cost of gram flour	570.00 (0.60)	900.00 (0.38)	1080.00 (0.27)	2550.00 (0.40)
9	Cost of polythene	961.50 (1.02)	3300.00 (1.39)	26055.00 (6.71)	30316.50 (4.82)
10	Carbendazim	840.00 (0.89)	1040.00 (0.44)	2664.80 (0.68)	4544.80 (0.72)
11	Formaldehyde	616.50 (0.65)	2700.00 (1.14)	9600.00 (2.47)	12916.50 (2.05)
12	Gas charges	259.50 (0.27)	480.00 (0.20)	589.00 (0.15)	1328.50 (0.21)
13	Labour cost	26250.00 (27.99)	66500.00 (28.16)	84130.00 (21.68)	176880.00 (28.15)
14	Miscellaneous	813.00 (0.86)	3000.00 (1.27)	9240.00 (2.38)	13053.00 (2.07)
15	10% Interest on variable cost	4398.15 (4.69)	10298.14 (4.36)	17528.40 (4.15)	32224.70 (5.12)
	Total variable cost	48379.65 (51.59)	113279.54 (47.97)	192812.00 (49.68)	354471.00 (56.41)
	Total cost	93771.14 (100)	236142.47 (100)	388044.00 (100)	628285.00 (100)
C	Returns				
16	Main produce	140341.50 (97.55)	437916.75 (98.42)	998100.00 (97.80)	1576358.00 (97.95)
17	By produce	3516.00 (2.44)	7020.00 (1.57)	22371.00 (2.19)	32907.00 (2.04)
18	Gross returns	143857.50 (100)	444936.75 (100)	1020471.00 (100)	1609265.00 (100)
19	Net return	50086.36	208794.28	632427.00	980980.00
20	B:C Ratio	1.53	1.88	2.62	2.56

Conclusion

The fixed capital investment is more than double in large and medium units as compared to small units. There is an affirmative association between production and farm size. Since mushroom cultivation is capital-intensive and increases with increase in farm-size, the financial assistance through institutional agencies at cheaper interest would help increase mushroom production. Proper institutional arrangements are required to supply the good quality of spawn at reasonable prices and in desired quantities to the mushroom growers. Oyster mushroom business generates more employment particularly aged female laborers as well as family child, thus incentives for mushroom business are provided. Government should provide subsidy to construct mushroom growing unit so as to promote the business.

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