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Comprehensive study of oyster, paddy straw and button mushroom in Chhattisgarh

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Abstract

India, being a developing country, is a diverse agro-climatic, abundance of agricultural wastes, a relatively low cost labour and a rich fungus fortunate for biodiversity. Combined these factors are a potentially prominent productive of India, temperate tropical and subtropical mushroom species. The market for Mushrooms continues to grow due to their culinary, nutrition, and interest in health benefits. They also show the ability to use in waste management. At present mushroom production in India is approximately 0.13 million tons. Compare to other vegetable per capita mushroom production in India 100 g per year. From 2010-2017, average annual growth rate of 4.3%. Out of total production of mushroom major contribution of white button mushroom (73%), followed by oyster (16%), paddy straw mushroom (7%) and milky mushroom share is (3%). In Chhattisgarh mainly three types of mushroom are produce oyster, paddy straw and button mushroom. A sample of 15 mushroom growers are selected out of 46 growers were randomly from list of mushroom growers obtain from Indira Gandhi Krishi Vishwavidyalaya, Raipur within Mahasamund, Raipur and Dhamtari district of Chhattisgarh plain region. Production cost of per kg of mushroom was Rs. 34, on an average total fixed; variable cost was Rs. 17493.53, and 16432.12 that contributed 51.56 percent and 48.43 percent of total cost, respectively. Average total cost of mushroom Rs. 33925.65 per year total gross return was Rs. 1340976 and net return Rs. 832091.2 per year; mushroom benefit cost ratio was 1.63. As per area higher production of mushroom timely availability of quality spawn, provide storage facility of mushroom growers in small level producer. Conduct training program in village level, provide knowledge about mushroom production, and spawn production. Government provide financial support of small mushroom grower and promote to production.

Keywords: Marketing, waste management, culinary, nutrition health, training facility, benefit cost ratio and constraints

1. Introduction

A mushroom is the fleshy, spore-bearing fruiting body of a fungus, typically produced above ground on soil or on its food source. Now mushroom is being cultivated in more than 100 countries of the world and the estimated total production is over 12 million tons (Suman and Sharma, 2007) [8]. The edible mushrooms are also good source of protein, vitamins and minerals (Khan *et al.*, 1981) [3]. The major drug property were attributed to mushrooms, reducing antibiotic, antibacterial, anti-cancer, antiviral activity, resistant and blood lipids (Bahl N, 1983) [2]. *Pleurotus* spp. is also rich in drug value, antioxidant, and antitumor activity in *Pleurotus florida*. (Nayana and Janardhanan, 2000) [4] Mushroom contain about 85-95 percent water, 3 percent protein, 4 percent carbohydrate, 0.1 percent fat, 1% mineral and vitamin (Tiwari, 1986) [9]. They also contain appreciable amount of potassium phosphorus, copper and iron but have low level of calcium (Anderson and Feller, 1942). Oyster mushroom has no starch, low sugar content and high amount of fibre, hence it serve as the least fattening food (Osei, 1996) [5].

1.1 Types and Importance of mushroom: In Indian condition found various types of mushroom because temperate, tropical and sub tropical climate are favourable for mushroom growth. A different type of mushroom likes oyster mushroom (*Pleurotus sajor-caju*), the paddy straw mushroom (*Volvariella volvacea*), white button mushroom (*Agaricus bisporus*), Ear Fungus (*Auricularia auricula* and *Auricularia polytricha*), Cremini Mushroom and Enokitake Mushroom. (Sharma K. 2018) [6].

The channel links the producers and consumers, and thereby supplying goods from producers to consumers. A large number of intermediaries are involved in the marketing channels the mushroom marketed through direct marketing and wholesaler marketing (Singh R. *et al.*,

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2006) [7] Direct marketing includes of mushroom to hotels, supermarket and at local market.

1. They have medicinal properties
2. Mushroom cultivation may be adopted as small-scale industry and may earn foreign exchange by commercial cultivation
3. Mushrooms are capable of agro-waste degradation

1.2 Objectives

1. To study various source of spawn procurement of various mushrooms.
2. To analyze the marketing practice followed by different mushroom growers under the study.

2. Material and Methods: The study was conducted Chhattisgarh plain region. Out of 14 districts of Chhattisgarh, Raipur, Dhamtari and Mahasamund district was select in the second stage sampling for the study as these districts account for 15 out of 78 mushroom producers in the state. Randomly select respondent through a structured interview schedule. Data were analysed using percentage and other economical tools and techniques. Marketing channel followed by mushroom growers using percentage methods.

3. Result and Discussions: In this chapter, data collection through questionnaire has been analysed. Under this chapter, result has been presented on different aspects of the mushroom grower's viz. socioeconomic status, land use pattern, spawn procurement, cost of production, marketing cost, marketing efficiency of mushroom, and marketing mix. The In this section the demographical profile of mushroom growers like age, education, production areas, occupation, knowledge level and different source of spawn procurement, marketing channel cost, margin and efficiency, constraints faced by mushroom growers.

3.1 To study various source of spawn procurement of various mushrooms.

The spawn can procured from the different source of govt. and private organization in Chhattisgarh plain regions.

1. Indira Gandhi Krishi Vishvavidyalaya, Raipur
2. Chhattisgarh Mushroom, Tandua New Raipur
3. Bhagwati agro tech, Todgaov
4. Surya agro tech, Balod
5. Mello spawn production unit, Mahasamund
6. Rajivlochan mushroom, Megha
7. Others Private institution

3.1.1 Source of Mushroom Spawns

Table 1: Classification based on Source of mushroom spawn (N=15)

S. No	Sources	No of Respondents	Percentage
1	IGKV, Raipur	12	80
2	Self	7	46.66
3	Bhagwati agro	3	20
4	Surya agro tech, Balod	1	6.66
5	Other state	2	13.33
6	Rajeevlochan, Megha	2	13.33

There are number of method are used for spawn production i.e. spore culture, tissue culture and multi spore culture. Procurement of mushroom spawn of different Govt. and private organization by growers in above the table show purchase of spawn IGKV, Raipur followed by 80 percent, self-production of spawn followed 46.66 percent grower produce, 20 percent grower are purchase on Bhagwati agro tech., Todgaov and Surya agro tech Balod, Rajeevlochan, Megha are sources of spawn procurement units.

3.2 Cost of mushroom production

The cost of production of mushroom crop has been calculated and presented in table. The total cost of component was variable cost and fixed cost. Variable cost involve are spawn paddy straw (bhushi), chemicals, Electricity/irrigation, packaging material and labour and building, equipments (Laminar airflow, autoclave, bamboo structure, rope etc) are include of component of fixed cost. The costs of production of mushroom are show in table total cost of per unit is Rs 33925.65 with fixed cost was 17493.53 and variable cost was 16432.12. On an average total fixed and variable cost was Rs17493.53 and 16432.12 that contributed 51.56 percent and 48.43 percent of total cost, respectively.

The variable cost, the labour cost was higher share 307.87 percent on an average of total cost. The other expenditure on, spawn and building were the other major items, which accounted for 237.69 percent and 229.91 percent of the total cost, respectively. The pipe, however, constituted the least share, 2.87 percent and followed by different, viz., 2.96 percent, 8.42 percent and 9.87 percent of the total cost on rope, bottle glass and equipment respectively. The whole, the share of labour cost in total cost was 307.87 percent followed by spawn 237.69 percent, building 229.91percent, and pipe 2.87 percent. Interest on variable cost was 48.43 percent and fixed cost was 51.56 percent of total cost. (Table 2)

Table 2: Cost of mushroom production (Rs/Farm)

A.	Particulars	Total cost/year	Average	Per kg cost
1	Family/Hired labour	1566720	104448(307.87)	0.08
2	Spawn	1209600	80640(237.69)	0.10
3	Paddy straw (Bhusha)	617100	41140 (121.26)	0.20
4	Poly bags	162480	10832(31.92)	0.79
5	Chemicals/calcium carbonate	174960	11664(34.38)	0.73
6	Irrigation/electricity	352320	23488(69.23)	0.36
7	Transporting charge	24850	1775.00(10.15)	4.84
	Sub total	4108030	273868.67(807.26)	0.031
	Interest on variable cost@6%			
	Total variable cost	246481.8	16432.12(48.43)	0.52
B.	Fixed cost			
1	Building	1170000	78000(229.91)	0.11
2	Rope	15070	1004.67(2.96)	8.55
3	Equipment	50250	3350(9.87)	2.56
4	Glass bottle	20000	2857.14(8.42)	3.00

5	Rack	292000	41714.29(122.96)	0.20
6	Laminar air flow	575000	82142.86(242.13)	0.10
7	Autoclave	490000	70000(206.33)	0.12
8	Pipe	14600	973.33(2.87)	8.83
9	Bamboo structure	43210	3600.83(20.58)	2.38
10	Sub total	2624030	178008.66(524.70)	0.04
	Interest on Fixed cost@10%			
11	Total fixed cost	262403	17493.53(51.56)	0.49
12	Total cost /yr	5088840.8	33925.65(100.00)	0.25
13	Total cost/kg			34.37

3.3 Marketing channel of mushroom: Normally marketing channel are forward movement or routes through which product or commodity finds its way from producers to end users. Marketing channel play a vital role in distribution or disposal of products and determining the producer share. There are three intermediary retailer, wholesaler and commission agents, the marketing channel exist intermediately they have perform various marketing function between producer to consumer for disposal of product. Marketing of mushroom are following different channels are

direct and indirect channel mainly oyster mushroom and button mushroom are sale in market because this mushroom demanded and nearly produce by growers. According to survey find out selected districts are Dhamtari, Mahasamund and Raipur is major mushroom production areas in Chhattisgarh.

3.3.1 Price Receives by producer in different marketing channel

Table 3: Different marketing channel are follow: (N=15)

S. No	Channel	No of growers	Percentage	Rs/kg
1	Direct	8	53	110
2	Sale to wholesaler	4	27	47
3	Sale outside retailer	3	20	90
	Total	15		

The price initiative is very important of growers remain in the business mushroom growing, grower receive price of different marketing channel it can be seen table the price of one kg of mushroom is Rs. 110 in direct selling. Comparatively less price, receive Rs 47per kg of mushroom to sold wholesaler and sale outside retailer price receive Rs.90 per kg of mushroom this channel are sale button mushroom only.

mushroom marketing. It can be seen in table that 53 percentage of disposal pattern of selling, these channels are obvious to receive immediate money of local growers and 47 percentage of disposed mushroom through wholesaler to consumer and 20 percentages follow by channel sale outside retailer of mushroom. Marketing cost are includes charge transporting and packaging, marketing margin are different mushroom is Rs. 90 are receive of mushroom growers, total marketing efficiency of different mushroom is receive of 47.26.

3.3.2 Marketing cost, margin and marketing efficiency

Marketing is an important aspect of growers in the business of

Table 4: Marketing cost, margin and efficiency of mushroom

S. No	Particulars	Rs/kg	%
1	Farmer sale price	150	83
2	Producer marketing cost		
A	Transportation cost	4	2.22
B	Packaging cost	2	1.11
3	Retail purchase price	120	66.66
4	Retailer margin	90	50
5	Consumer purchase price and retailer sale price	180	
6	Total Marketing efficiency	47.26	

The data present in above table that producers share in consumer rupee in 83 percent by selling of fresh mushroom the wholesaler and retailer receive market margin 50 percent without include any other charge, producer marketing cost are transportation and packaging cost is minor to total cost.

- In 60% of the respondents, mushrooms were growing at 100-1000 square feet, and more than 5000 square in most areas were (13.33%).Most of the mushroom growers were engaged in 60% to earn money in mushroom cultivation.

4. Conclusion

4.1 Profile of Respondents

- The majority of mushroom growers (40%), were of age between 31-40 years and 20% of mushroom growers that were <30 years of age.
- The majority of mushroom growers (46%) were graduates and (40%) were 10 + 2.

4.2 Cost of Production concept

- The total cost of production for one kg of mushroom was found Rs. 34. The expenditure on labour cost was major contribution (307.87%).
- The cost of production total average cost per farm was Rs. 33925.65. On an average total fixed and variable cost was Rs. 17493.53 and 16432.12 that contributed 51.56

- percent and 48.43 percent of total cost, respectively
- Mushroom returns of per kg Rs. 122, per kg of cost of production was Rs. 34 and selling price of mushroom of per kg was Rs. 156.
- Mushroom profitability ratio was 1:1.63 and average total mushroom production was 8596 kg.
- Cost of production per kg of mushroom by products like mushroom powder Rs. 1045, badi (Rs 267), pickle (Rs. 281.64) and Rs. 631 per kg cost of dry mushroom.
- Mushroom by product per kg of product benefit cost ratio was mushroom powder 1:1.44, Mushroom Badi was 1:1.5, dry mushroom followed by 1:1.9 and mushroom pickle profitability ratio was 1:1.41.

4.3 Marketing concept

Mushroom marketing follow different marketing channel in study area Direct channel followed by 53 percent, also farmer- wholesaler channel 27 percent and 20 percent mushroom growers using farmer-outside retailer- consumer channel.

- Distribution of product and by products of mushroom followed by different market but majority of mushroom market using by growers within a city 56.66 percent, local area market distribute products followed by 40 percent of growers and 6.66 percent growers distribution other state.
- Marketing of mushroom used different mode of transportation 60 percent growers using own vehicle and 40 percent growers use bus for transportation.
- Marketing cost includes packaging cost and transportation cost find out per kg of marketing cost was Rs. 6 were transporting cost Rs. 5 and packaging cost was Rs.1.
- Marketing margin of mushroom, button mushroom per kg margin was Rs 90.5 and marketing efficiency was Rs 47 of mushroom.

5. Suggestions

- The dissemination of mushroom price through electronic and print media is extremely important. E marketing can be promoted in state for quick marketing of marketing surplus of mushroom production.
- Mushrooms are perishable in nature and are susceptible to temperature. State Government should establish storage facilities and processing centres at the Block level for the Mushroom Producers.
- Mushroom farming is a seasonal activity try to mushroom grow round a year. Mushroom growers provide technical and financial support.
- Mushroom growers provide technical knowledge about spawn production through Government institutes and Krishi Vigyan Kendra.
- Mushroom producer contact super market, restaurant and vegetable store to easily supply of products.
- Extension workers should spread technology of mushroom production and conduct training program at village areas.

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