



## Research Article

# ESTIMATION OF DOMESTIC RESOURCE COST FOR PRODUCTION OF OYSTER MUSHROOM IN RAIPUR DISTRICT OF CHHATTISGARH

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**Abstract:** This study was done in Raipur district of Chhattisgarh, where paddy production is a major source of income for the farmer. Paddy production encourage farmer to use paddy straw as a media for mushroom production. The main aim of the study was to observe cost of domestic resources like paddy straw, labour, supplement. For the study sample farmer/grower were categorised in three group large, medium and small level of producer and estimated the domestic resource cost and production cost for oyster mushroom production. Result showed that straw is the major cost component after spawn in oyster mushroom production.

**Keywords:** Domestic resource cost, Mushroom, Paddy straw, Domestic Resource Cost, Chhattisgarh

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## Introduction

Mushroom is a perishable crop grows seasonally. In scientific term it is a fungus, grow in decay materials like light soil, distorted leaves and wood, at 15 to 35 degree centigrade temperature. Mushroom morphology says that it consist of a cap called pileus, a stem called stipe and a gills called lamellae. It usually found in different colour like white, pink, brown, yellow. Mushrooms have delicious taste along with various medicinal properties. Like it has high fibre content, it is a sugar free food, high protein (80 %), anticancer property. Around 2300 spp. are found in the world out of that only 300 spp. are grown in India, such as Button, Oyster, Paddy straw, Milky mushroom, puff ball *etc.* In Chhattisgarh mushrooms is commonly known as "futu". Naturally it grows in all over Chhattisgarh due to adoptive climatic condition but Raipur, Durg, Bilaspur, Dhamtari, Janjgir-Champa are the district where it grows prominently/commercially. Oyster and Paddy straw mushrooms are recognised variety of Chhattisgarh which is used for commercial production. But due to high perishability of Paddy straw mushroom grow at limited extend and sale at nearby local market. While oyster mushroom has 5-6 day of perishable life due to which commercialization of this variety of mushroom is more prominently adopted by all level of growers. Production of oyster mushroom requires a shade area, labour, paddy/wheat straw as media, spawn, chemicals, water, rope and other equipment's. Oyster mushroom grows in hanging bag of 2-3 kg which consists of paddy straw, spawn, supplement and chemicals. Within 25 to 30 days bag produces 1.5 to 2.0 kg of mushroom. Domestic resource cost (DRC) is the cost of locally available resources which for farmer or grower not needed to pay directly. It is usually a by-product of farm's activities like paddy straw, water, fuel (wooden stick for burning), family labour and additional utility of equipment's like water tank, water spray, chopper machine, shaded area *etc.* With the help of above local resource a small/marginal farmer can produce sufficient volume of mushroom which provides him economical support. Therefore it is necessary to calculate and evaluate the domestic resource cost of oyster mushroom and helps to reduce overall production cost. It also identifies those points which affect scaling up of mushroom production. It will motivate small and marginal farmers to use more and more local resources in mushroom production activities.

## Methodology

In Chhattisgarh state Raipur district has potential market of mushroom there for purposely four mushroom producing villages nearby Raipur city are selected for the study. These villages were namely Raikheda, Girodh, Tendua and Ameri. For selection of farmer, clusters involved in mushroom production were identified and list was prepared. And fifty one farmers from that list were selected randomly for study. these farmers were categorised in small (up to 50 bags), medium (50 to 100 bags) and large level (more than 100 bag) farmers according to mushroom producing bags. By help well-structured questionnaire farmers were interviewed and get primary data regarding number of family members, land holding, cropping pattern, irrigation resources, fixed and variable assets, cost of production, market price, sale price *etc.* In second stage Agriculture extension officers and researchers were interviewed by help of questionnaire and get secondary data for study regarding sale price, volume of sale and purchase, cost incurred in marketing *etc.* Simple statistical tools and techniques were used in calculation/estimation /evolution of domestic resources cost, production cost, marketing cost of mushroom. The depreciation rate of farm assets was calculated as per there life, which is varies to 20 percent. The Production cost was calculated by adding fixed cost and variable cost of components. Formula for above calculations is-

$$\text{Production cost} = (\text{fixed cost} + \text{variable cost}) / \text{Produce (Kg)}$$

The Domestic Resource Cost (DRC) was calculated by present cost analysis. Under DRC calculation locally available component were included such as cost of straw, family labour, shed area, *etc.*

The gross returns were calculated as-

$$\text{Gross return} = \text{Total production (Kg.)} \times \text{Average sale price (Rs.)}$$

## Result and Discussion

### Cost of Oyster Mushroom Production

Estimation of production of oyster mushroom was done by tabular analysis of variable and fixed cost. The variable cost consists of cost of straw, spawn, labour, polybags, chemical, supplement, *etc.* After critical analysis of table it is assess that the major share of cost is covered by spawn, which is used as seed in mushroom production.

Table-1 Category wise cost estimation for production of oyster mushroom.

Particulars	Large		Medium		Small	
	Rs./Bag	Percent	Rs./Bag	Percent	Rs./Bag	Percent
(A) Variable cost						
Straw (Kg)	6.00	18.29	6.00	16.90	6.00	15.74
Spawn (Kg)	11.00	33.54	12.00	33.79	13.00	34.10
Labour (hrs.)	3.90	11.89	4.00	11.26	4.17	10.94
Polybag	0.36	1.10	0.36	1.01	0.36	0.94
Bavistin (gm.)	0.60	1.83	0.70	1.97	0.80	2.10
Formalin(ml)	0.70	2.13	0.80	2.25	0.90	2.36
Supplement and other	2.50	7.62	2.30	6.48	2.00	5.25
(B) Depreciation on fixed assets	5	15.24	6.54	18.42	8.05	21.12
(C) Interest on working capital	2.74	8.35	2.81	7.91	2.84	7.45
Final cost of production per Bag = A+B+C	32.80	100.00	35.51	100.00	38.12	100.00

Figures in parenthesis show the percentage of total

The reason behind this scenario is availability of spawn was limited and it is usually produce in high cost laboratories under supervision of highly qualified/skilled person. Spawn covers 33.54, 33.79 and 34.10 percentage of cost of production in large, medium and small level of mushroom production. Straw is second largest cost in production of oyster mushroom which share 18.29, 16.90 and 15.74 percent for large, medium and small level of growers respectively. Table also shows that the cost of straw reducing towards small grower. Third important cost is labour charges; it shares 11.89, 11.26 and 10.94 percent of cost production, which is also reducing towards large level of production, because cost per bag reduces according to how much number of bags they growing. Other cost in production of oyster mushroom were cost of poly bag, bavistin, formalin, supplements and fuel and it cover collectively 5.06 percent in production. While medium and small level of production it covers 5.23 and 5.4 percent only which seems that the number of increasing bags reduces the cost of polybag. The cost of supplement and other material that required in mushroom production goes down because at small level grower were avoiding it for money saving. Depreciation on fixed assets includes cost of shed, tank, spray, rope, thermometer, cooler, etc. The depreciation rate of fixed assets was based on its self-life which varies 10 to 20 percent for six crops per year. The depreciation on fixed cost shared 15.24, 18.42 and 21.12 percent of total cost of oyster mushroom production in large, medium and small growers respectively. The final cost of oyster mushroom production was calculated by adding fixed cost, variable cost and interest on working capital, which results 32.80, 35.51 and 38.12 rupees per bag in large, medium and small level of growers respectively.

Table-2 Category wise estimation of gross return

Particulars	Large	Medium	Small
Cost of production per bag	32.80	35.51	38.12
Cost of production per Kg. of mushroom	23.80	25.36	27.22
Average no. of bags	1004	71.45	18.77
Average Produce (Kg.)	1405.88	100.04	26.28
Average sale price (Rs.)	134	121.36	120
Average Gross return (Rs.)	188387.92	12140.78	3153.6

Table-3 Category wise estimation of net return on oyster mushroom production (per crop)

Particulars	Large	Medium	Small
Sale price (Rs.)	134	121.36	120.00
final cost of prod per Kg (Rs.)	23.80	25.36	27.22
Net return on per kg (Rs.)	110.2	96	92.78

### Economics of Mushroom Production

The economics of mushroom production is presented in table. The average production of oyster mushroom was estimated 1405.88 kg, 1100.09 kg and 26.28 kg at large, medium and large farms respectively. Similarly, average selling price of mushroom was also recorded as 134.00 Rs./Kg, 121.36 Rs./Kg and 120 Rs./Kg in large, medium and small level of growers, which generate average gross return of Rs. 188387.9, Rs 12140.78 and Rs. 13153 at large, medium and small level of growers. Tabular analysis shows that larger level growers were getting higher

profit as compare to medium and small growers, because scaling up of mushroom production reduces the overall cost of production. Net return was also calculated in study of mushroom production, and its estimation shows downward return to small scale of production. Because small farmers have lack of storage facilities and they have to sale on same day at variable or low price.

### Domestic Resource Cost

Table-4 Category wise domestic resource cost for mushroom production (Rs./Bag)

Particular	LARGE		MEDIUM		SMALL	
	Rs.	Percent	Rs.	Percent	Rs.	Percent
Paddy Straw (Kg)	6.00	48.39	6.00	56.82	6.00	49.30
Labour (hrs)	3.90	31.45	4.00	32.52	4.17	34.26
Suppl.(Kg) and other(Fuel etc)	2.50	20.16	2.30	18.17	2.00	16.43
Total cost	12.40	100.00	12.30	100.00	12.17	100.00

Figures in parenthesis show the percentage of total

Tabular analysis of mushroom production explained that domestic resource cost for large, medium and small growers was ₹12.40, ₹12.30 and ₹12.17 respectively. The major portion of this cost covered by straw and it follow by labour charges, cost of shed and cost of supplement. Straw is basically a by-product of paddy production, and it is available in every farm family. Small and medium levels of grower were using their own straw for mushroom production while large level of growers and some medium level of grower were purchasing it. Similarly small and medium level of grower were use their own house structure/shed (Kaccha and Kachha-Pakka), while large level of grower were constructed separate shed (Cemented structure) for mushroom production process. For production of mushroom, labour was also an important factor, study of production statistic of mushroom also explain that small level of grower were not hiring labour form outside, they produce by themselves and medium level of grower were hired 2-4 labour according to scale of production and available family labour, while Large level of growers were totally dependent on hired labour. Study also identified that use of supplement (*Besan, Maida, Atta*) was not equal at all level of growers. Only large and medium level of grower were use using it while Small level of grower were not prefer to use it, reason behind this is reduction of cost in mushroom production. Above information/data was explaining that use of local/domestic resources was more on small and medium level of growers, while large level of growers were hire or purchase the production component which leads hick of overall cost of oyster mushroom production.

### Conclusion

Study of domestic resource cost of oyster mushroom reveals that straw share 48.39, 48.78 and 49.30 percent of total resource cost of large, medium and small level of growers. Cost of straw is followed by labour charges which shares 31.45, 43.18 and 34.26 percent of total domestic resource cost of large, medium and small level of growers. In case of supplement large and medium levels of grower were using it while small levels of grower were not use supplement in oyster mushroom production.

**Application of research:** Study of domestic resource cost of oyster mushroom will be helpful to determine locally available resources and its cost, which will motivate farmers to use these resources and gain more and more profit.

**Research Category:** Quantitative research deals with estimation of cost

**Abbreviations:** Kg.- Kilogram, Rs.- Rupees, hrs.- Hours.

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