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Date of Received

28 October, 2020



Date of Revised

22 November, 2020



Date of Acceptance

24 December, 2020



Date of Publication

31 December, 2020

<https://doi.org/10.51514/JSTR.2.4.2020.1-5>

To link to this article: <http://jstr.org.in/downloads/pub/v2/i4/1.pdf>



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ABSTRACT

The study was carried out in mushroom production unit of Department of Rural Technology Chauras Campus, HNBGU, Srinagar Garhwal in the year 2017-19. The study examined the cost, returns and break-even point of mushroom production on different mushroom production in Uttarakhand as the sustainable source of income in rural areas. The result shows that if mushroom price per kg decline to Rs.136.20 provided actual production is not less than 59.25 kg in oyster mushroom and Rs.114.30 provided actual production is not less than 441.11kg in button mushroom in a cycle of cultivation. A total of four production periods annually can be achieved in Uttarakhand. Strengthening mushroom production farming could be essential in order to sustain the rural economy to keep its development, increasing and diversifying business and employment opportunities. Mushroom production may provide income opportunities for small farmers. Simple tabular analysis, benefit-cost analysis and break-even analysis is done for statistical analysis. The study concluded that mushroom entrepreneur in Srinagar Garhwal valley may be successful if done with skill and proper planning.

Keywords: *Mushroom production, Benefit/Cost Analysis, Rural Development, Uttarakhand*

INTRODUCTION

Mushroom belongs to the biological kingdom Fungi. These are unable to make their own food because of lack of chlorophyll; therefore, they grow on residues of other organic compound. They are found commonly in forest areas and are well-known source of food from ancient times. India produces about 600 MT of agricultural wastes per annum and a major part of it is left out to decompose naturally or burnt in-situ. This waste can be useful to produce a large scale of quality mushroom. By just converting 1 percent of agro-waste towards mushroom cultivation, it can produce 3 MT of mushroom [8]. There are more than 20 edible mushroom var. are present at this time. White Button, Oyster, Milky, Paddy straw, Shitake and some other mushroom are very popular among consumer but 80 percent of Indian market is covered by White button mushroom (*Agaricus bisporus*) only [10].

India is mainly an agricultural based country which contributes nearly one-fifth of the GDP. Most of the families in India mainly depend on small family farms. Small family farms drawback are they do not have enough land to produce crops and raise animal. For sustainable improvement in rural people livelihood both socially and environmentally and on the basis of utilization of local resources and their

potential, mushroom entrepreneur could be very good opportunities in India. Mushroom production can be significant to the extent that non-agricultural job and income generation. Intensive type of mushroom production could provide good alternative income opportunities for small family enterprises since they do not have adequate land to produce crops and raise animal [4]. Also, rural environment can be protected as mushroom cultivation is an environmental friendly agricultural practice. In this condition, self-employment can be very imperative way to increase employment rate for small and marginal households for generating employment and earning extra income. They can easily cultivate mushroom in their home yard because it needs small piece of land where mushrooms can be grown [1].

Uttarakhand is a leading mushroom producing state in India and has potential to increase its production [10]. Among various species of mushroom button has a good demand among consumers in Uttarakhand and nearby other state markets. In state 3-4 crops of mushrooms can be taken easily in low cost seasonal cultivation and 5-6 in environmentally controlled condition. It will increase income with nutritional quality of food. Mushroom is complete diet for all age groups.

A mushroom grower is required to have adequate information about the production technology and also information about the economics of mushroom cultivation. Depending on the availability of work force, raw materials, infrastructure and market, planning for a small, medium and large unit may be chalked out, yet it is crucial to determine the optimum output level which makes a farm viable. The economics of mushroom cultivation differ across regions, and also have a bearing on the benefit-cost ratio [12].

In Uttarakhand state more than 75 percent of the population depends on agriculture for their livelihood. Terrace farming is main feature of Uttarakhand state. Another typical feature of here is the small and scattered land holdings. The average size of holding in the state is around 0.98hac which is also scattered.

Keeping in view of all these aspects, the present study was conducted in the valley of Srinagar Garhwal with the following objectives:

1. To check out the production of mushroom round the year in Srinagar Garhwal.
2. To estimate the economic feasibility of small scale mushroom production in Srinagar Garhwal.
3. To identify the constraints in mushroom production in Srinagar Garhwal.

MATERIAL AND METHOD

The present study is carried out at Department of Rural Technology, HNB Garhwal University Srinagar/Chauras Campus, Uttarakhand, India. The area is situated around the Alaknanda River, which is Srinagar, Srikot, Chauras, and Kirtinagar. The method to grow mushroom is same as described by DMR, Solan, Himanchal Pradesh [3,11]. For cost estimating, the average expenditure on various inputs like straw, spawn, insecticides, casing soil, labour and other miscellaneous material was taken. This cost along with the interest on working capital (@ 10 % per annum) formed the total variable cost. The returns were calculated based on the actual prices received by the growers. The return over variable cost and net returns were calculated by deducting the respective cost from the gross returns. Break-even point (BEP) of output was calculated by using the following formula [5-7].

Cost of cultivation: Cost of total cultivation is defined as:

$$\text{Total Cost} = \text{depreciation on total fixed cost} + \text{total variable cost}$$

Fixed cost: Fixed cost include cost incurred on equipment, shed and overhead charges including interests on fixed capital & depreciation, maintenance etc.

Variable cost: Variable costs include spawn, substrate, labor, chemicals, casing, polythene sheets, transport charges, electricity rate, market charges etc.

Profitability: To check the profitability in mushroom production the following efficiency measures are use in the study.

Benefit-cost ratio:

$$\text{Benefit Cost Ratio} = \frac{\text{Gross income}}{\text{total cost}}$$

Break-even production & price:

$$\text{Production} = \frac{\text{Total cost}}{\text{price/unit}}, \text{ Price} = \frac{\text{Total cost}}{\text{production}}$$

RESULTS AND DISCUSSION

Cost on Oyster Mushroom Production

It may be noted from the table no.1 that the total cost from oyster mushroom production is Rs.11850. Depreciation on the civil work is estimated on 10% and 5% on machinery. In variable expenditure, cost of straw and spawn is highest. Other expenditure is less than 10%.

Table 1: Return from Oyster mushroom production

S. No.	Particulars	Price (Rs.)
1	Cost of production	11850
2	Gross income	17400
3	Net income	5550
4	Benefit-Cost ratio	1.47:1

Return from oyster mushroom production

The study revealed that the return from oyster mushroom production is profitable. The gross return from unit is Rs.17400 which generates the net income of Rs.5550 (Table1). Break even analysis (BEA) revealed that if unit produced 59.25kg mushroom did not gain or loss under given total cost of production and actual price. It also may be noted that if mushroom price per kg decline to Rs.136.20 provided

actual production is not less than 59.25kg (Table 2). Breakeven price is much less than the actual market price of mushroom prevailed in the market. The unit is in profit under given cost and production level.

Table 2: Break even production and price of Oyster mushroom

S. No.	Particulars	Production (Kg)	Price (Rs)
i.	Actual	87	200.00
ii.	Break even	59.25	136.20
iii.	Gap	27.75	63.80

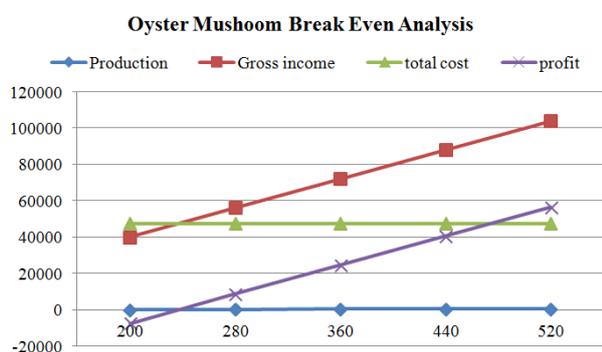


Fig.1- Break Even analysis Chart

Cost on button mushroom Production

It may be noted from the table 3 that the total cost on button mushroom production is Rs.59550. Depreciation on the civil work is estimated on 10% and 5% on machinery. In variable expenditure, cost of compost and transport is highest. It alone comprises the 97% of cost of variable expenditure. Other

expenditure is less than 3%.

Table 3: Return from Button mushroom production

S.No.	Particulars	Price (Rs.)
i)	Cost of production	59550
ii)	Gross income	70335
iii)	Net income	10785
iv)	Benefit-Cost ratio	1.18:1

Return from button mushroom production

The table 4 shows that the gross return from unit is Rs.70335 which generates the net income of Rs.10785. Break even analysis revealed that if unit produced 441.11kg mushroom did not gain or loss under given total cost of production and actual price (Fig. 2). It also may be noted that if mushroom price per kg decline to Rs.114.30 provided actual production is not less than 441.11kg. Breakeven price is less than the actual market price of mushroom prevailed in the market. The unit is in profit under given cost and production level.

Table 4: Break even production and price of Button mushroom

S. No.	Particulars	Production (Kg)	Price (Rs)
i.	Actual	521.00	135.00
ii.	Breakeven point	441.11	114.30
iii.	Gap	79.89	20.70

Button Mushroom Break Even Analysis

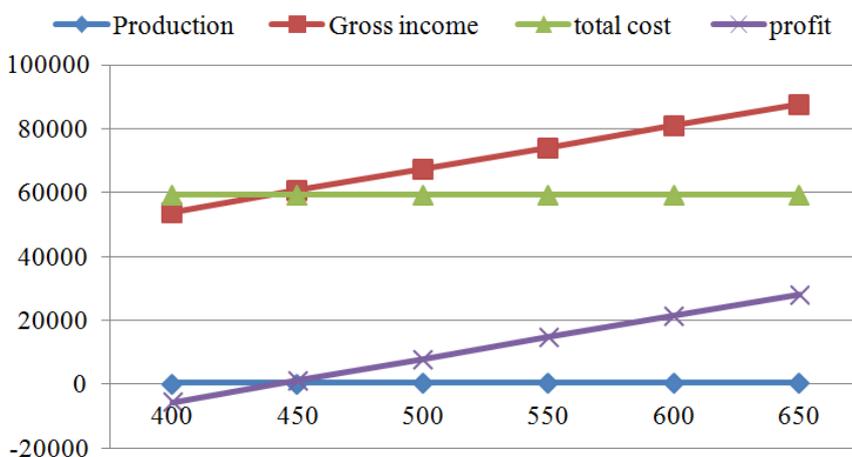


Fig.2. Break Even analysis Chart

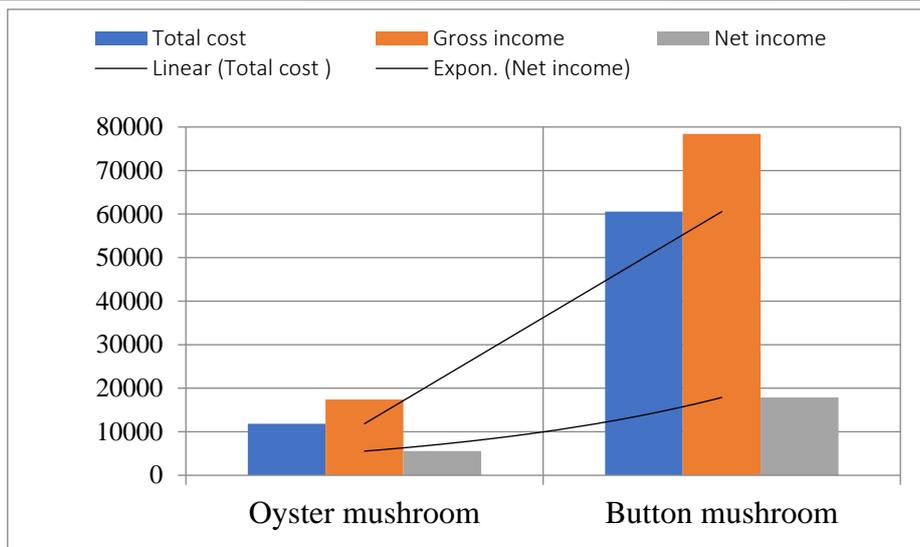


Fig.3- Cost/Benefit Analysis

CONCLUSIONS

The cost benefit chart shows that to achieve similar net profit cost of production is very high in button mushroom compare to oyster mushroom production. The two varieties of mushroom is cultivated *i.e.* Button mushroom and Oyster mushroom. The present study provides the baseline economic analysis of different varieties of mushroom in study area in suitable season. The recurring cost is very high in both varieties due to availability of raw material in locality. If raw material is available locally then the cost could be low and profit will be much higher as transportation charges will be null. The study provide that there is enough market for mushroom as there is no problem in marketing of mushroom although there is high demand of mushroom in market. The yield obtained in study from both varieties found low due to the improper timing of cultivation. It is because of raw material is not available locally. Also, spawn is purchased from other states. The study concluded that mushroom entrepreneur can achieve four production periods annually [2] in Srinagar Garhwal valley if done with skill and proper planning.

Constraints of mushroom production

The production of mushroom in the study is not very satisfactory there is found low yield due to various reasons. This could be due to the poor management, low input applications, agro-climatic factors and lack of marketing knowledge. It can be caused due to poor quality of spawn and casing. Some

of the constraints are given below:

- i. Lack of spawn units in locality
- ii. Lack of compost unit in State
- iii. Lack of proper markets
- iv. Low input application
- v. High transportation charges
- vi. Lack of storage facility

Suggestions

- There are enough raw materials in hilly areas but it is scattered, so there should be collection centre in hilly areas.
- Compost for button mushroom must be prepared in locality. It will reduce a large amount of total production cost.
- Spawn unit should be started in the study area.
- Universities and govt. should open a mushroom demonstration unit in hilly areas with compost and spawn facilities.

ACKNOWLEDGEMENT

I am thankful to Head, Department of Rural Technology for providing necessary facilities for the study.

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