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A Facet of Marketing Effectiveness of Button Mushroom Production in Mid-Hills of Himachal Pradesh

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Abstract**—** *Mushroom marketing involves promoting and selling mushroom produce to wholesalers, retailers and consumers. Studying the marketing aspect of button mushroom production is crucial because it helps mushroom growers to understand consumer demand, optimizing pricing strategies, identifying effective distribution channels and ultimately maximizing profits by ensuring their mushrooms reach the market efficiently and meet consumer expectations, especially considering the perishable nature of the product and need to maintain supply fluctuations in a dynamic market. In this respect, an attempt has been made in this paper to identifying the major marketing channels involved in mushroom business and the different functionaries involved in transferring the product from producer to ultimate consumers along with their marketing costs, margin, price spread, marketing efficiency and the producer share in the consumer's rupee. It has been found that three marketing channels were followed in the study area but channel-2 (Mushroom growers—Retailer---consumer) was the most widely used channel in which 48.16 per cent of the produce was marketed by 40.60 per cent of the mushroom growers. The producer's share in the consumer's rupee was highest for chaneel-1 (98.87 %) but this channel could absorb only 10.55 per cent of the total produce. Channel-2 was the important channel from the sale point of mushroom as it absorbs 48.16 per cent of the produce and was used by 54 mushroom growers and had 73.65 per cent of the producer's share in the consumer's rupee. Additionally, opinion of the mushroom growers and their marketing functionaries were also enlisted regarding their problems and the constraints which hampered them not to take this enterprise/venture as their farming business in a big way. In this context, production, marketing, institutional and social problems are the major constraints which inhibit them not to adopt this venture as their business in a big way.*

Keywords**— Button mushroom, marketing channel, marketing Wholesaler, retailer, consumer**

I. INTRODUCTION

The ultimate goal of any commercial activity is to guarantee an efficient market for its product. The marketing of mushrooms include all the processes, agencies and the channel which are involved to transfer the produce from mushroom growers to consumers. Marketing plays a vital role in production of mushroom since it has the power to influence remunerative prices, which in turn influences production incentives. If the marketing system is not efficient, the production cannot fetch reasonable prices.

With regard to its management, mushroom cultivation requires 80-90 per cent relative humidity and temperature range of 16^0C -23^0C. The cultivation starts with compost preparation followed by spawning, casing, harvesting and processing. Mushrooms are picked just before the cap expands and the gills are exposed. When the cap develop around 3-3.5 cm in diameter and attain button stage, individual mushroom are picked up by holding it between forefingers and thumb and gently removing it from the casing bed. The dirt is removed by cutting off the soiled

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stem portion with knife and cleaned mushrooms are put in collecting baskets. The yield is highly variable and depends upon the quality of compost, the strain of the spawn used and proper management of the crop. The harvested mushroom has very short life. At a temperature of $20C^0$, the mushroom deteriorates in 1-2 days. After harvesting, deterioration appears in terms of browning and discoloration of buttons. Therefore, the picked up mushrooms are dipped and washed in a solution of potassium metabisulphate(KMS) to prevent browning and discoloration of buttons.

In relation to its packaging in the study area, the picked up mushrooms are thoroughly washed and dipped in a solution of KMS, and are weighed on electronic and ordinary balance while putting in 200g polythene bags and or trays. The polythene bags are sealed using candles and pricked with small needle to allow aeration. The whole lot is put in large hand carry bags. The hi-tech units pack trays in boxes.

Concerning to the procedure of its sale, as fresh mushroom have very short shelf life. These cannot be transported to long distance without refrigerated transport facility. Therefore, these are sold in a highly localized market in the surrounding areas. Because of the limited duration and limited marketing area, some mushroom growers face the problem of over-saturated market. Thus few of them are forced to sell their produce at below the prevailing market price. As for as sale is concerned, few customers very well known to the growers reach their doorsteps for purchase and get fresh material at reasonable price. The mushroom growers also received orders for bulk supply of mushrooms for marriage, birthday and other religious and social function in the area. Some mushroom growers have developed their linkage with hotels, restaurants and soup making rehriwala or dhabas. Majority of growers have made their links in the market and at their own level supply to retailers and wholesalers. The produce at individual level varies from kg to quintals per day easily carried out in hand bags or boxes and transported by public vehicle or own vehicles. The mushroom growers received their payments in cash on the same days and the cases of deferred payments were negligible. With this background in view, an attempt has been made in this paper to identifying the major marketing channels involved in mushroom business and the different functionaries involved in transferring the product from producer to ultimate consumers along with their marketing costs, margin, price spread, marketing efficiency and the producer share in the consumer's rupee and also highlighting the various constraints such as production, marketing, institutional and social problems faced by the mushroom growers in their production and for direct and intermediary-based marketing.

II. MATERIALS AND METHODS

The study was conducted in Kangra district of Himachal Pradesh. This district was selected purposively because the Indo Dutch Mushroom Project Palampur, which is run by the State Directorate of Horticulture and located in the CSKHPKV Palampur, provides spawned compost to mushroom producers in several districts. Secondly, the centre for mushroom research and training (CMRT) CSKHPKV, Palampur also provides spawned compost bags and spawn of different kind of mushrooms i.e. button and Oyster mushrooms. Thirdly, training on many different aspects of mushroom farming is also provided by the directorate of extension education CSKHPKV Palampur. And lastly, large number of mushroom growers is also present in the district and no study was conducted in the recent year that is why the Kangra district was selected purposively.

Simple random sampling design was employed for the selection of mushroom growers. The complete list of mushroom growers of the district was prepared in consultation of the officials of the Indo-Dutch mushroom Project, Palampur. From the list prepared a sample of 60 mushroom growers were selected randomly from the seven randomly selected blocks. The selected mushroom growers were categorized into two categories i.e. small and large on the basis of number of compost bags they kept by using cumulative square root frequency method. The distribution of sample mushroom growers is given in table1.

Table 1: Distribution of mushroom growers among different categories using square root frequency method

Sr.No.	Category	Number of compost bags	Number of mushroom growers	Percentage of mushroom growers
1.	Small	<300	40	66.67
2.	Large	≥300	20	33.33
	Total		60	100.00

Data Collection

Data for this study were collected by using simple random sampling technique. Primary data were gathered from producers (mushroom growers), wholesalers and retailer through personal interviews and survey, while secondary data were obtained from various sources, including government offices and relevant literature. The analysis focuses on key metrics such as marketing costs, margin, price spread and producer's share in consumer's rupee to determine the most efficient marketing channel for mushroom growers in Kangra valley. The data were collected pertaining to the agricultural year 2023-24. The collected data was compiled properly and analyzed by employing appropriate mathematical and statistical tools.

Analytical Framework

Marketing Channels

Marketing channels refers to various intermediaries which were involved for the transfer of mushroom produce from mushroom growers to consumers. The personal survey of various intermediaries involved in the marketing process was done to assess the different marketing channel that the mushroom growers in the research area used to market their mushrooms.

Marketing cost and margins

The total cost incurred on marketing by the mushroom growers and various intermediaries involved in the sale and purchase of the commodity till the commodity reaches to the ultimate consumer, may be computed as follows:

$TC_m = C_m + \sum MC_i$

Where,

TC_m= Total cost in marketing of mushroom

C_m= Cost incurred by the mushroom grower in marketing

$\sum MC_i$= Marketing cost incurred by i^{th}middleman

Marketing Margin

Total Marketing margin of the middlemen was calculated as the difference between the total payments (marketing cost + purchase price) and receipts (sale price) of the middlemen and calculated as follows:

$$A_{mi} = P_{Ri} - (P_{pi} + C_{mi})$$

Where,

A_{mi} = Absolute margin of i^{th} middlemen

P_{Ri}= Selling price of i^{th}middleman

P_{pi}= Purchase price of i^{th} middleman

C_{mi}= Marketing cost incurred by i^{th} middleman

Price Spread

Total marketing margin or price spread is the difference between the price paid by the consumer and price received by the producer. Price spread generally measures the economic efficiency of the marketing system. Smaller the price spread; greater is the efficiency of the marketing system.

Producer's share in Consumer's rupee

It is the price received by the mushroom grower expressed as a percentage of price paid by the consumer (sale price of retailer) and it has been worked out as given below:

$$PS = \frac{PG}{PC} \times 100$$

Where,

PS= Producer's (mushroom grower) share in consumer's rupee

PG=Price received by the mushroom grower

PC=Price paid by the consumer or sale price of retailer

Marketing efficiency of the marketing channels

The marketing channels' efficiency indicates that the goods are moved from producer to consumer at the lowest feasible cost, consistent with the provision of services desired by the consumer. Shepherd's marketing efficiency index was used to measure the marketing efficiency of various marketing channels of mushroom (Acharya and Agarwal, 1992) and was worked out as follow:

$$ME = \frac{RP}{MC + MM} - 1$$

Where,

ME= Marketing efficiency

RP= Price received by the retailer

MC= Total marketing costs

MM= Total marketing margins

Problems and constraints

To know the problem and constraints in mushroom cultivation, Henry Garrett's ranking technique was employed. The major benefit of Garrett's ranking over standard frequency distribution is that the respondents rank the constraints according to their relative importance. The order of ranks given by the respondents will be converted into percent position by using the following formula:

$$\text{Percent position of each rank} = \frac{100 \text{ x } (R_{ij} - 0.5)}{N_j}$$

With reference to the table provided by Garrett and Woodsworth (1969), the per cent position of each rank

was converted into scores. The sum of individual respondent's score for each factor was divided by the total respondents for whom score were added and these mean score for every factor were arranged in descending order and were given ranks and the most significant factor was identified.

III. RESULTS AND DISCUSSIONS

Marketing channels of button mushroom in the study area: Marketing channels are the route or the path through which the commodity changes hand from producer to ultimate consumer. Market functionaries such as wholesaler and retailer etc serve as a link between producer and consumer throughout the entire marketing process. Marketing channels significantly impact the disposal and the sale of the produce. In the study area, there were two different intermediaries that were involved between producer and consumer i.e. retailers and wholesalers. Effective utilization of the marketing channels can help mushroom growers to increase the profitability from the produce. The main marketing channels that were involved in the marketing of button mushrooms in the study area were as follows:

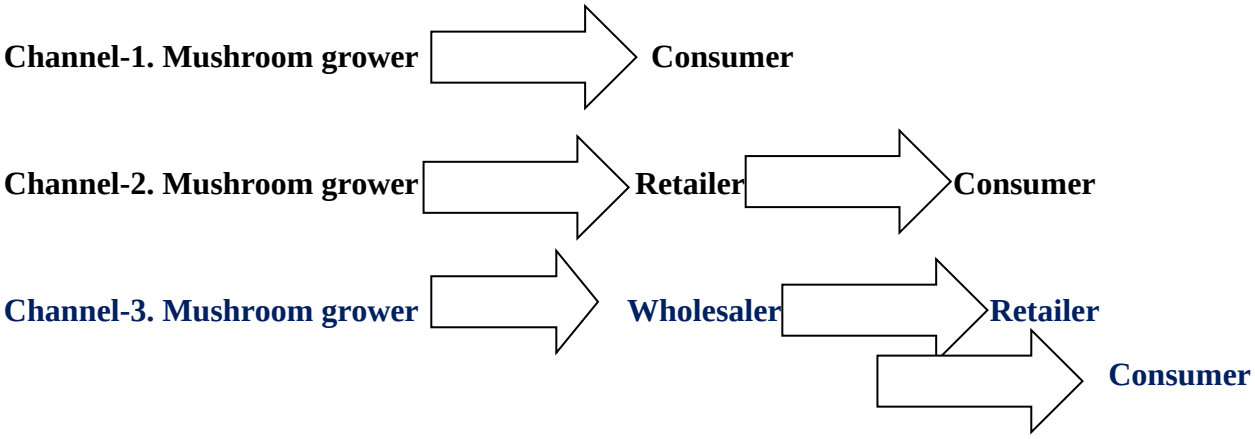

Table 2 indicates the pattern and disposal of button mushroom in the study area. It is evident from the table that 40.60 per cent of the mushroom growers followed the channel-2 (Mushroom grower—Retailer------Consumer). The total quantity of mushroom that was marketed through this channel was 48.16 per cent of the total production. The second important route was channel-3 (mushroom grower—Wholesaler---Retailer----Consumer) through which 41.30 per cent of the produce was marketed by 24.06 per cent of the mushroom growers. Only 10.55 per cent of the total produce was disposed through channel-1 (Mushroom grower-----Consumer) and this channel was used by 35.34 per cent of the total mushroom growers. When comparison was made between small and large farms, it was found that more percentage of produce was marketed using channel-2 in case of small farms (69.58%) whereas in case of large farms, channel-3 was the mostly used by the mushroom growers for marketing (48.91%).

Table 2: Pattern and utilization of button mushroom on sample farms

Sr. No.	Particulars	Farm Size					
		Small		Large		Overall	
		No.	Qty.(q/farm)	No.	Qty.(q/farm)	No.	Qty.(q/farm)
1.	Mushroom Grower →Consumer	30	0.33	17	1.85	47	0.83
		(39.47)	(10.68)	(29.82)	(10.62)	(35.34)	(10.55)
2.	Mushroom Grower →Retailer---Consumer	34	2.15	20	7.05	54	3.79
		(44.74)	(69.58)	(35.09)	(40.47)	(40.60)	(48.16)
3.	Mushroom Grower →Wholesale---Retailer---	12	0.61	20	8.52	32	3.25

	Consumer						
		(15.79)	(19.74)	(35.09)	(48.91)	(24.06)	(41.30)
	Total	76	3.09	57	17.42	133	7.87
		(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: Figures in parentheses indicate the percentages to the total in each category.

Marketing cost, margins and price spread through different channels: The price spread is the discrepancy between the amount a customer pays and the amount a farmer receives per unit of produce. Price spread analysis is typically used to evaluate the economic efficiency of the mushroom marketing systems. It also shows the producer's percentage of the consumer rupee along with marketing expenses and profit margins of several market intermediaries for the services they provide in helping to transfer mushrooms from producers to ultimate consumers. Marketing cost includes all the marketing charges from local assembling to retailing in the marketing process. The producer has to pay these costs to bring mushrooms to the market which includes washing, packing and transportation charges etc. Marketing margin is the difference between the price that a certain agency earned and the amount that it paid. The marketing costs and margins should not be excessive otherwise it will lead to inefficient marketing system which further diminishes the producer's share in the consumer's rupee. The price spread for different marketing channels has been presented in table-3.

Table 3: Marketing cost, margins and price spread through different channels

(Rupees/Kg)

Sr. No.	Particulars	Channel I	%of consumer price	Channel 2	%of consumer price	Channel 3	%of consumer price
1	Price received by grower	150	100	150	75	135	66.18
2	Marketing Cost Incurred by grower/producer	1.7	1.13	2.7	1.35	2.7	1.32
i)	Washing and packing charges	0.9	0.6	0.9	0.45	0.9	0.44
ii	Transportation Charges	0	0	1	0.5	1	0.49
iii	Packing Material	0.8	0.53	0.8	0.4	0.8	0.39
3	Net price receive by growers	148.3	98.87	147.3	73.65	132.3	64.85
4	Marketing Cost incurred by wholesaler	-	-	-	-	22.4	10.98
i)	Handling	-	-	-	-	2	0.98
ii	Wastage	-	-	-	-	15	7.35
iii	Commission	-	-	-	-	3.4	1.67
iv	Market fee	-	-	-	-	2	0.98
5	Sale price of wholesaler	-	-	-	-	165	80.88
6	Gross margin of wholesaler	-	-	-	-	30	14.71
7	Net margin of wholesaler	-	-	-	-	7.60	3.73
8	Cost incurred by retailer	-	-	29	14.5	24.8	12.16
i)	Wastage	-	-	21	10.5	18	8.82
ii	Transportation	-	-	2	1	2	200
iii	Loading and Unloading	-	-	2.8	1.4	2.8	1.37

iv	Commission	-	-	3.2	1.6	2	0.98
9	Gross margin of retailer	-	-	50	25	39	19.12
10	Net margin of retailer	-	-	21	10.5	14.2	6.96
11	Sale price of retailer	150	100	200	100	204	100
12	Consumer purchase price	150	100	200	100	204	100
13	Price spread			50		69	

The above table revealed that the net price received by the growers in channel-1 is the highest at Rs.148.30 per kg of mushrooms followed by channel -2 (Rs. 147.3 per kg) and channel-3 at Rs. 132.3 per kg. Similar results were shown by Singh (2014) from Punjab state. The net margin by the retailer was the highest in channel-2 at Rs. 21 whereas it was Rs. 14.2 in channel-3. The price spread worked out for channel-2 and channel-3 was Rs. 50 and Rs. 69 per kg respectively. It shows that as the number of intermediaries' increases, price spread also increases.

Marketing Efficiency: Marketing efficiency demonstrates the extent to which the various marketing firms were able to transfer mushrooms from growers to buyer's at the most affordable price while maintaining the highest level of customer's satisfaction along the supply chain. The marketing efficiency of the mushroom has been calculated using shepherd's formula and presented in table 4.

Table4: Channel wise marketing efficiency of mushroom production in the study area

Sr. No.	**Particulars**	**Marketing Channels**		
		Channel-I	**Channel-II**	**Channel-III**
1.	Price paid by consumer	150	200	204
2.	Total marketing cost	1.7	31.7	49.9
3.	Total marketing margin	-	21	21.8
4.	**Marketing efficiency index**	**87.24**	**2.8**	**1.85**
5.	Net producer price	148.3	147.3	132.3
6.	**Producer's share in consumer's rupee%**	**98.87**	**73.65**	**64.85**

It can be viewed from the table that channel-1 has the highest marketing efficiency of 87.24 followed by channel-2 (2.8). The producer's share in the consumer's rupee was also highest for channel-1 (98.87%) but this channel was not much efficient from the sale point of mushrooms because it could only absorb 10.55 per cent of the produce (Table-2). Similar results were shown by Koundal and Kumar (2024) from Solan district of Himachal Pradesh. Channel-2 was the important channel from the sale point of mushroom as it absorbs 48.16 per cent of the total produce (Table-2) and was used by 54 mushroom growers (Table-2) and has 73.65 per cent of the producer's share in the consumer's rupee. The difference in the marketing efficiency of channel-2 and channel-3 was due to the fact that more number of intermediaries was involved in channel -3 than the channel-2that is why channel-3 has less marketing efficiency (1.85) than the channel-2 (2.8).

Problems and constraints in mushroom cultivation: In addition to the marketing aspects of mushrooms by examining the marketing channels, marketing costs, margin, price spread, marketing efficiency and producer's share in the consumer's rupee of button mushrooms, a considerable scope exist for identifying the major constraints faced by the growers in cultivating mushrooms. Such an analysis has profound impact while making the policy implication of any study. In this context, the survey was also conducted to identify the various problems and constraints encountered by mushroom growers during mushroom production. The constraints that the mushroom grower had to deal with were categorized into four sub-heads which were production problem, marketing problem, institutional problem and social problem. Garrett's ranking technique was used to analyse the various problems and the results of the findings have been given in table 5.

It can be viewed from the table that in case of production problems, the problem of insect-pests and diseases was found to be the most significant and was ranked first with average Garrett score of 65.00. The second important production problem that the mushroom grower faced was the non-availability of spawned compost bags at appropriate time followed by non-availability and costly labour with average Garrett score of 59.07, 49.68 and 38.03 respectively. Non availability of insecticide and fungicide was ranked last with a Garrett score of 37.30.

Table 5: Problems and constraints in mushroom cultivation:

S.No.	Particulars	Sum of Score	Mean	Rank
A	**Production Problems**			
1.	Nom-availability of spawn compost bags at appropriate time	3544	59.07	II
2.	Problem of insects, pests and diseases	3900	65.00	I
3.	Non-availability of labour	2981	49.68	III
4.	Non availability of insecticide and fungicides	2238	37.30	V
5.	Costly labour	2282	38.03	IV
B	**Marketing Problems**			
1.	Disposal of produce is difficult due to lack of specialized agencies	3440	57.33	II
2.	Low level of marketable surplus	2175	36.25	VII
3.	High transportation charges	3300	55.00	III
4.	Lack of market information	2325	38.75	VI
5.	Lack of storage facilities	4425	73.75	I
6.	Low prices of produce	2540	42.33	V
7.	Lack of knowledge about processing	2975	49.58	IV
C	**Institutional Problems**			
1.	Inadequate training facilities	2164	36.04	III
2.	Insufficient extension staff	3342	55.70	II
3.	Lack of supply of package of practices in Hindi	3494	58.23	I
D	**Social Problems**			
1.	Lack of interest of family members in mushroom cultivation	3260	54.33	I
2.	Inadequate space	2740	45.67	II

In case of marketing problems, the first major problem was the lack of storage facilities followed by difficulty in disposal of produce due to lack of specialized agencies with Garrett score of 73.75 and 57.33 respectively. The third major marketing problem was high transportation charges with average Garrett score of 55.00. Moreover, the problems such as lack of knowledge about processing, low price of produce, lack of marketing information and low level of marketable surplus were the medium level constraints and were ranked as fourth, fifth, sixth and seventh with an average Garrett score of 49.58, 42.33, 38.75 and 36.25 respectively.

The table also depicts the institutional constraints encountered by the mushroom grower where the major constraint was the lack of supply of package of practice in Hindi followed by insufficient extension staff with an average mean value of 58.23 and 55.70 respectively. Inadequate training facility was the least problem with Garrett score of 36.04. Two types of social problems were faced by the mushroom growers in the study area in which lack of interest of the family members in the mushroom cultivation ranked first with Garrett score of 54.33 and non-availability of space ranked second with Garrett score of 45.67.

IV. CONCLUSION

The study on the marketing channels of mushrooms in mid hills of Himachal Pradesh reveals significant insights into the efficiency and profitability of different marketing

strategies. Channel-1, where producer sell directly to consumers, demonstrate higher efficiency with a producer share of 98.87 % and lower marketing costs. Conversely, channel-2 involving retailers, results in higher marketing costs and lower producer shares at 73.65% in the consumer's rupee. Despite providing retailers with significant margins, channel-2 reduces overall marketing efficiency (2.8). It can also be concluded that although the producer's share in the consumer's rupee was highest in channel-1 (98.87%) but this channel was not much efficient from the sale point of mushrooms as it could only absorb 10.55 per cent of the total produce. Channel-2 was the important channel from the sale point of mushroom as it absorbs 48.16 per cent of the total produce and was used by 54 mushroom growers. Channel-3(Mushroom grower—Wholesaler---Retailer----Consumer) has very less marketing efficiency because of the fact that more number of intermediaries were involved in this channel. It was also concluded that as the number of intermediaries' increases, price spread also increases. These findings underscore the advantage of direct marketing channels in maximizing producer shares and efficiency. Thus to enhance economic benefits to mushroom growers, agricultural stakeholders and policymakers should consider promoting direct sale to retailer to consumers and should remove too much intermediaries in the marketing process.

With regard to constraints in mushroom farming and its marketing, problem like insect, pests and diseases, non-availability of spawn compost bags at appropriate time, non-availability of labour coupled with costly labour were the important constraints from production point of view. Lack of storage facilities, difficulty in the disposal of the produce, high transportation charges, lack of knowledge about processing and low price of produce are the important problems from marketing perspectives in the study area. Another important problem in cultivating mushroom for the mushroom growers was the institutional constraints such as lack of supply of package of practice in Hindi and insufficient extension staff. Among the social problem, lack of interest of the family members in mushroom cultivation is the major constraint. Thus to reap the highest lucrative return from this venture, there is a need to address all these production, marketing, institutional and social problems at government level.

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