



Marketing Efficiency, Costs and Price Spread among Different Market Functionaries Involved in Marketing of Goat in Bundelkhand Region of Uttar Pradesh

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ABSTRACT

Background: Goat farming in India significantly contributes in the rural employment. Goats and its products have thriving markets worldwide, including in Asia, Africa and Europe. Demand is mostly driven by increased purchasing power, but other variables also contribute a lot. The vast majority of domestic markets rely on local demand and do not cross international borders. The study was performed on Bundelkhandi goat breed of Uttar Pradesh to identify the prospects of goat farming in this region.

Methods: The study was conducted in Jalaun district of Bundelkhand region over the year 2023-24. Data was systematically collected and analysed from 120 goat farmers and 20 market intermediaries involved in its marketing process. Cost analysis methodology was adopted to estimate various costs involved. Acharya's method was adopted to calculate the market efficiency for different marketing channels and Garrett ranking technique was used to categorize and identify the production and marketing constraints.

Result: The results of the study area revealed that the average flock size of small, medium and large category in Jalaun district was found as 3.5, 9.5, 22.85. The major investment was involved in purchasing of goats. Total variable cost involved was 81.9 per cent and the share of total fixed cost was found to be 18.01 per cent of the total cost. Returns from animal sale was found to be the maximum. In this present study, four marketing channels were found in the Jalaun district: 1) Channel I: Farmer-Farmer. 2) Channel II: Farmer- Retailer. 3) Channel III: Farmer - Village Trader-Retailer. 4) Channel IV: Farmer-Village Trader-Local trader-Distant trader. Since there was no any intermediary involved in channel I and there was no price spread, that's why it was considered as a most efficient channel in the district. Further, in Jalaun district, channel II had higher efficiency with 5.0 followed by channel III (4.89) and channel IV (4.45). Disease incidence, high veterinary expenses, costly concentrate feed, costly dry fodder, malpractices by middle men and distant markets were found to be the most faced production and marketing constraints by the farmers.

Key words: Flock size, Marketing channel, Marketing efficiency, Proportional allocation.

INTRODUCTION

Goat is an important livestock and considered as income generating small ruminant for the small and marginal farmers. The issue is the low density of economic livestock activity in small ruminant production systems, compounded with remoteness, poor infrastructure and long-standing traditional relationships between buyers and brokers. In addition, seasonality and climate variability present major constraints to the predictable supply of animals that large buyers want, further constraining market development (Hamza *et al.*, 2014). Every country in Asia, Africa and the Middle East where eating meat from both sheep and goats is common enjoys goat meat and in some, like the Indian plains, the goat is the main source of meat (Sharma, 2020). Goat meat is most frequently consumed in China, followed by India and Pakistan. Since India is one of the top exporters of goat skin, there is a significant opportunity to increase goat production for quality leather manufacture as well as for domestic consumption of meat. India, which has the second-highest goat population in the world, can be quite helpful in tapping into this industry (Sharma, 2020). There are about 148.88 million goats as per 20th Livestock

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Census in the country which consist the third place after poultry and cattle (DAHD, 2023). Tribes and the impoverished make up the bulk of goat growers in India. It has been estimated that approximately 25% of goats are recognized native breeds, with a tiny percentage being crossbred (Majumder *et al.*, 2023). In India, Uttar Pradesh holds the third position in term of goat population which is 1.44 crore after Rajasthan (2.08 crore) and West Bengal (1.63 crore). Growth rate of goat from the 19th Livestock Census 2012 to the present 20th Livestock Census 2019 is 10.14 per cent.

As Bundelkhandi goat is an important breed of Bundelkhand region but still it belongs to a non-descript population of goats in the country which forms about 70 per cent of the total goat population of the country (Verma and Mishra, 2014). Here are some breeds which are also found in the Bundelkhand region like Jamunapari, Barbari, Jakhrana, Sirohi *etc.* which are mainly reared for the purpose of meat production (CIRG, 2023). This study evaluates the economics of marketing efficiency, cost and price spread in goat marketing in the Bundelkhand region of Uttar Pradesh and it offers valuable insights for future researchers, policymakers and others in the livestock sector. Thus, considering the demand for goats and from the income and employment point of view the present research has been done with an aim to analyze the costs and returns, examine the marketing channels, their efficiencies and constraints in production and marketing of goat farming.

MATERIALS AND METHODS

The study was conducted in Jhansi division of Bundelkhand region of Uttar Pradesh state as an M.Sc. thesis work under Banda University of Agriculture and Technology during 2023-24. Jalaun district from Jhansi division was selected purposively on the basis of the maximum population of goats (GOI 2019 Livestock census data). From the selected district, one block was selected randomly ('Kuthond' block in Jalaun). 4 villages were selected randomly and from each village proportional allocation procedure adopted to collect a sample of 120 goat farmers. The goat rearers were classified into the small, medium and large categories based on their flock size (1-6, 7-12, >12), (Singh *et al.* 2009), from two districts. The actual cost of home-produced green fodder was considered. The prevailing market price in the particular region was considered for dry fodders and feeds while working out the feed and fodder cost. For estimating the labour expenses, detailed data about working hours was collected and total man days (8 hours "work = 1 day") were calculated. The imputed value of family labour was also taken into consideration. The local prevailing wage rate was considered for labour expenditure. Fixed cost comprised of depreciation and interest on investment. Depreciation was calculated by diminishing balance method @ 5 per cent per annum for buildings, 10 per cent

per annum for types of equipment and interest on fixed capital was worked out @10.5 per cent per annum (Dixit *et al.* 2014). The gross return has been calculated by multiplying total production with per unit price. The prices prevailing in the market were considered. The net returns have calculated as the difference between the gross returns and total cost. To analyse the net return, following cost concept of Dhondyal (1985) were used:

Cost A: Depreciation on shed and equipment + expenses on feed and fodder + wages of hired human labour + veterinary expenses.

Cost B: Cost A + interest on fixed capital.

Cost C: Cost B + implicit cost of family labour.

Benefit-cost ratio has been calculated as gross returns divided by total cost. For a profitable business, benefit-cost ratio should be more than one. To accomplish the objectives of the study, appropriate statistical tools and techniques like averages and percentages, *etc.* were used and relevant inferences were drawn. Tabular analysis was adopted to analyze the costs and returns.

To assess the costs and margins of various functionaries involved until the produce reaches the hands of the end users/consumers, a small sample of five intermediaries in each district associated with the marketing of live goats from the selected goat farmers were chosen. For this marketing channel, price spread, marketing cost, marketing margin and marketing efficiency have been calculated. This allowed for the examination of various marketing channels for the disposal of live animals in the study area. Marketing channel referred to a chain of intermediaries through which live goats and goat meat travelled from producers to ultimate users.

$$C = C_{mf} + C_{m1} + C_{m2} + C_{m3} + \dots + C_{mi}$$

Where,

C = Total cost of marketing of commodity.

C_{mf} = Cost paid by producer from the time the produce leaves the farm till it gets sells.

C_{mi} = Cost incurred by the i^{th} middleman in the process of buying and selling of product.

To examine the marketing efficiency, Acharya's method of marketing efficiency (Acharya and Agarwal, 2012) was used which is given below:

$$\text{Marketing efficiency} = \frac{\text{Price received by farmer}}{\text{Marketing cost} + \text{Marketing margin}}$$

RESULTS AND DISCUSSION

Investment, costs and returns

The results (Table 1) revealed that the majority of the investments done on goats. The overall investment in goats was found Rs. 98,160.91, the investment on shed/structure was Rs. 2744.5, whereas the investment on equipments was found to be Rs. 715.67. The overall investment on per pair of goats in the district was Rs. 8461.99. Khadda *et al.* (2018) also reported in their study that majority of the

investment was done by goat rearers on the cost of goats with 87.59 per cent. The overall total fixed cost was found to be 18.01 per cent of the total cost. Interest on the fixed capital was the main component of fixed cost that was Rs. 10,670.21 per farm (17.67 per cent) followed by depreciation on shed Rs. 137.23 per farm (0.23 per cent) and depreciation on equipments *i.e.*, Rs. 71.57 per farm (0.12 per cent). According to Khadda *et al.* (2018), 22.11 per cent was the share of fixed cost in total cost and its main component was interest on fixed investment (20.87 per cent). Further, the overall total variable cost was reported as Rs. 49,519.65 per farm (81.99 per cent of total cost). Its

main component was total labour value *i.e.*, Rs. 43,584.27 per farm (72.16 per cent) followed by fodder and concentrate feed with Rs. 3133.48 per farm (5.18 per cent) followed by veterinary expenses with Rs. 2300 per farm (3.80 per cent) and mineral mixture with Rs. 501.9 per farm (0.83 per cent). The overall total cost was reported as Rs. 60398.66 per farm. The overall total return was reported as Rs. 1,06,030.92 per farm. The total return's main component was animal sale value. The overall net return including family labour was Rs. 49,932.78. Returns over different costs per rupee 100 of investment in small, medium and large flock sizes is given in Table 2. The overall benefit cost

Table 1: Investment, costs and returns from goat rearing in Jalaun District (2023-24).

Particulars	Small (32)		Medium (60)		Large (28)		Overall (120)	
	Value	%	Value	%	Value	%	Value	%
Investment on goat farming								
Goats	28262.5	96.82	7628.37	96.27	189491.85	96.77	98160.91	96.6
Shed/structure	725	2.48	2420	3.04	4945.5	2.53	2744.5	2.7
Equipment	204.69	0.70	552.5	0.69	1387.5	0.71	715.67	0.7
Total Investment	29192.19	100	79700.87	100	195824.85	100	101621.08	100
Investment per pair of goat	8340.63		8389.57		8570.01		8461.99	
Fixed costs								
Depreciation on shed	36.25	0.21	121	0.25	247.28	0.21	137.23	0.23
Depreciation on equipments	20.47	0.12	55.25	0.11	138.75	0.12	71.57	0.12
Interest on fixed capital	3065.18	17.83	8368.59	17.31	20561.61	17.78	10670.21	17.67
Total fixed cost	3121.90	18.16	8544.84	17.67	20947.64	18.12	10879.01	18.01
Variable costs								
Dry fodder and concentrate feed	984.38	5.73	2550	5.27	5866.07	5.07	3133.48	5.18
Mineral mixture	147	0.85	399	0.83	959.7	0.83	501.9	0.83
Veterinary expenses	200	1.16	2200	4.55	4500	3.89	2300	3.80
Total labour value	12740	74.10	34656	71.68	83356.8	72.09	43584.27	72.16
a.) Family labour	12403.2	72.14	33744	69.79	79234.56	68.52	41793.92	69.2
b.) Hired labour	336.8	1.96	912	1.89	4122.24	3.57	1790.35	2.46
Total variable cost	14,071.38	81.84	39,805	82.33	94,682.57	81.88	49519.65	81.99
Total cost	17,193.28	100	48349.84	100	1,15,630.21	100	60398.66	100
Returns								
Animal sale value	30023.46	94.47	78818.37	93.78	188185.76	93.04	99009.27	93.38
Sale of milk/consumed	1050	3.30	3676.37	4.37	9071.43	4.48	4599.27	4.33
Sale of manure/used	708.1	2.22	1554.9	1.85	5004.15	2.47	2422.38	2.28
Total return	31781.56	100	84049.64	100	202261.55	100	106030.92	100
Net return including family labour	14588.28		35699.8		86631.34		49932.78	
Net return/goat/month (including family labour)	662.10		1620.26		3931.83		2266.24	
Net return excluding family labour	26991.48		69443.8		165865.9		86741.1	
Net return/goat/month (excluding family labour)	1225.03		3151.76		7527.95		3936.81	
Returns over different	Cost A	86.21	78.76		71.28		83.13	
Costs per rupee 100 of investment	Cost B	75.72	68.26		60.78		72.63	
	Cost C	40.31	34.28		30.64		41.09	
Benefit cost ratio		1.84	1.74		1.75		1.78	

ratio was found to be 1.78. The study (Table 2) shown that in marketing channel-I {Farmer- Farmer (farmer bought for the purpose of further rearing)}, farmer received Rs. 4492.5 (100 per cent) from live goat sale. Since there was no involvement of any intermediary dealer, so price spread was zero and farmer's received price and consumer's paid price was same. In marketing channel II (Farmer- Retailer), price received by the farmer was Rs. 4492.25 per animal. Marketing cost incurred by retailers was Rs. 25 and retailer's margins were Rs. 882.75 per animal. At the end, consumer paid price was found to be Rs. 5400 per animal. In this channel, price spread was Rs. 907.75 per animal and marketing efficiency was 5.0. The similar kind of findings were also found in previous studies that small ruminants may be raised as complementary outputs in mixed crop-livestock systems, although specialist producers may be found in dryer areas. Many research studies suggest that local village markets offer the best bargaining power in spot markets for producers, although in an unregulated environment (Steven, 2015). In marketing channel III (Farmer-Village Trader-Retailer), price received by farmer was Rs. 4492.25 per animal. The village trader's marketing margins were Rs. 310 per animal and retailer's marketing margins were Rs. 512.75 per animal. At the end, retailer's sale price/consumer's purchase price was found

to be Rs. 5410 per animal. In this channel, price spread was Rs. 907.75 per animal and marketing efficiency was 4.89. On the other hand, marketing channel IV (Farmer-Village Trader-Local trader- Distant trader), price received by farmer was Rs. 4492.25 per animal. The village trader's and local trader's marketing margins were Rs. 300 per animal and Rs. 285.71 per animal. At the end, distant trader's purchase price was found to be Rs. 5500.81 per animal. In this channel, price spread was Rs. 1,008.56 per animal and marketing efficiency was 4.45. Channel I was considered as most efficient channel as there was not any price spread in this channel supported by the findings of (Srivastava and Saraswat, 2006), found that, in contrast to other organizations involved in the weekly market, the majority of goat farmers chose wholesalers. This could be because the wholesalers offered better and faster payment and there were no middlemen involved. Further, channel II had higher efficiency followed by channel III and channel IV.

Same pattern and almost same channels are found relatable with the findings of Gunaseelan (2018). In his study he found 5 marketing channels in which most of the goat farmers (40.00 per cent), who were doing goat farming commercially preferred channel I farmer-farmer (for breeding or rearing purpose) for their goat marketing because of no marketing cost and for high market efficiency.

Table 2: Marketing costs, margins and price spread of live animal marketing in Jalaun, 2023-24. (Rs. per animal)

Functionary/item of cost	Channel I (Farmer-Farmer -consumer)		Channel II (Farmer- Retailer)		Channel III (Farmer-Village Trader-Retailer)		Channel IV (Farmer- Village Trader-Local trader- Distant trader)	
	Amt	PCP	Amt	PCP	Amt	PCP	Amt	PCP
Net price received by farmer/ Village trader's purchase price	4492.25	100	4492.25	83.19	4492.25	83.19	4492.25	83.61
Marketing costs incurred by village trader								
Labour	-	-	-	-	-	-	-	-
Transportation	-	-	-	-	40	0.74	40	0.73
Market fees	-	-	-	-	30	0.56	30	0.55
Miscellaneous	-	-	-	-	-	-	-	-
Village trader's margin	-	-	-	-	310	5.73	300	5.45
Village trader's sale price/ Retailer's or Local trader's purchase price					4872.25	90.06	4862.25	88.39
Marketing costs incurred by retailer or local trader								
Labour	-	-	-	-	-	-	42.86	0.78
Transportation	-	-	25	0.46	25	0.46	285.71	5.19
Market fees	-	-	-	-	-	-	18.57	0.34
Miscellaneous	-	-	-	-	-	-	5.71	0.10
Retailer's or local trader's margin	-	-	882.75	16.35	512.75	9.48	285.71	5.19
Total marketing costs	-	-	25	0.46	95	1.76	422.85	7.69
Total marketing margins	-	-	882.75	16.35	822.75	15.21	585.71	10.65
Retailer's or local trader's sale price/ consumer's or Distant trader purchase price	4492.25	100	5400	100	5410	100	5500.81	100
Price spread	0		907.75		907.75		1008.56	
Marketing efficiency	0		5.0		4.89		4.45	

Table 3: Ranking of production and marketing constraints related to feed and fodder being faced by goat farmers in Jalaun District of Bundelkhand during the year 2023-24.

A.	Production constraints faced by the farmers	% position	Garrett's table values	Total score	Mean score	Rank
1	Costly concentrate feed	64.29	42	3944	65.73	I
2	Costly dry fodder	50.00	50	3733	62.22	II
3	Less availability of dry fodder	35.71	57	3699	61.65	III
4	Lack of technical knowledge	78.57	34	2860	47.67	IV
5	Disease incidence	21.43	66	2560	42.67	V
6	Poor milk yield	8.33	77	2337	38.95	VIII
7	High veterinary expenses	7.14	78	2276	37.93	VI
8	Poor weight gain	92.86	22	1868	31.13	VII
B. Production constraints faced by the farmers						
1	Malpractices by middlemen	56.25	47	3501	58.35	I
2	Distant market	43.75	53	3481	58.02	II
3	Less price of live animals	68.75	40	3095	51.58	III
4	Higher marketing cost	81.25	32	2910	48.5	IV
5	Delay in payments	31.25	60	2890	48.17	V
6	Lack of market information	93.75	20	2829	47.15	VI
7	Fluctuating prices of live animals	18.75	68	2779	46.31	VII
8	Lack of proper market	6.25	80	2515	41.92	VIII

Furthermore, this research revealed that none of the characteristics of producers affect the likelihood of goat producers selecting their marketing strategies in districts, contrasting with the findings of Hobbs (1997).

Constraints related to production and marketing faced by goat farmers

As evident from Table 3, there are several constraints which have been reported here by goat farmers. They were asked to rank these constraints in order to 1, 2, 3, 4, 5, 6, 7 and 8, the Garrett's table value was taken for other ranks from the Garrett's ranking table. Costly concentrate feed was found to be the most challenging production related constraint followed by costly dry fodder also supported by the findings of Maesela *et al.* (2019), less availability of dry fodder, lack of technical know-how, disease incidence, poor milk yield, high veterinary expenses, poor weight gain, among the 8 production constraints Bundelkhand region is one of dry region in India and due to this reason, the availability of green fodder is quite difficult in this region and this might be one of the most common reasons that majority of the goat keepers are dependent on dry fodder for feeding their livestock that must be going to increase the prices of dry fodder as well as concentrate. Among the marketing related constraints marketing, malpractices by middlemen got the first rank followed by distant market, less price of live animals, high marketing cost, delay in payments, lack of market information, fluctuating price of live animals and at last lack of proper market were found to be the most affecting constraints in goat farming.

CONCLUSION

The study indicates significant potential for the goat production sector to enhance its contribution to the Bundelkhand economy. This can be achieved by improving marketing efficiency through the establishment of a more effective market intelligence system, minimizing marketing margins of intermediaries and enhancing the capacity of goat producers in both production and marketing processes. The findings of this study provide goat producers with valuable insights to strategically plan their sales in district markets, ultimately leading to increased revenue. Effective information sharing and technology transfer initiatives should guarantee that small goat farmers stay up to date on advancements to strengthen their negotiating position. No organization in Bundelkhand region keeps an eye on the market and disseminates information about it. Friends and nearby farmers were the primary sources of market knowledge and price information was shared on a personal basis. The likelihood that goat producers will choose district markets is not much impacted by network dummies because they have inadequate market knowledge networks. To better connect smallholders to markets, innovation must continue. Cooperatives will still be crucial in some markets for animal products, but more adaptable and commercially oriented models for product assembly and coordination will be required. Creative organizational models for extensive production systems, such as those that typically meet the growing demand for small ruminant meat. Because there is a wide variety of market development experimentation among NGOs and others in

India, market and institutional economists should focus their research efforts on these themes.

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Conflict of interest

The authors have no conflict of interest to declare. All co-authors have seen and agree with the content of the manuscript. We certify that the submission is original work and is not under review at any other publication.

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