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ECONOMIC ANALYSIS OF CAULIFLOWER MARKETING IN CHANDRAKONA-2 BLOCK OF PASCHIM MEDINIPUR DISTRICT (WEST BENGAL)

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ABSTRACT

Packing, transportation, and loading/unloading are the three largest components of the total marketing cost, together accounting for approximately 72% to 74% across all farm categories. These expenses represent the most significant share of marketing operations, indicating the areas where efficiency improvements could yield cost savings. Loading and Unloading Charges are also significant, accounting for approximately 23% of the total cost across all farm categories. These costs are relatively stable and highlight the labor-intensive nature of this stage in the marketing process. Weighing Cost, though smaller in absolute terms, varies with farm size. It is highest in marginal farms. Packing Cost includes the expense of materials such as gunny bags, plastic crates, or bamboo baskets used for transporting the produce. It remains consistently high across all farm sizes, ranging from ₹6.12 to ₹6.65 per quintal, which constitutes around 24% to 25% of the total marketing cost. Overall, total marketing cost per quintal is highest in marginal farms (₹26.78 per quintal), followed by small farms (₹25.94) and medium farms (₹24.93). This trend clearly indicates that larger farms benefit from economies of scale, leading to a reduction in per-unit marketing expenses.

In Channel-1 (Direct Marketing), farmers sell cauliflower directly to consumers, bypassing all intermediaries. This channel yields the highest benefit for producers, with a net additional income of Rs. 58 per quintal, after incurring a marketing cost of Rs. 25 per quintal. The consumer purchase price in this channel is Rs. 988 per quintal and the producer's share in the consumer's rupee is the highest at 97.46%

In Channel-2, local petty traders or itinerant retailers purchase cauliflower directly from farmers at the farm gate and sell it in the local market. These traders perform both procurement and retail functions, earning a substantial net margin of Rs. 104 per quintal, while incurring Rs. 66 per quintal in marketing costs. The consumer purchase price increases to Rs. 1075 per quintal and the producer's share drops to 84.18%

In Channel-3, the supply chain becomes more complex, involving multiple intermediaries: commission agents, wholesalers, and retailers. Farmers sell cauliflower at Rs. 942 per quintal, incurring a minimal cost of Rs. 11, and earn a modest margin of Rs. 26 per quintal. The product then passes through a commission agent (net margin: Rs. 42), a wholesaler (net margin: Rs. 26), and a retailer (net margin: Rs. 52), with each adding their own marketing cost (Rs. 66, Rs. 72, and Rs. 30 respectively). Consequently, the final retail price paid by consumers rises to Rs. 1230 per quintal. In this channel, the producer's share declines sharply to 75.68%,

KEYWORD: *Commission Agent, Wholesalers, And Retailers Marginal Farms, Marketing Cost*

I. INTRODUCTION

The conversion of food crops into high-value agricultural products, particularly vegetables, has emerged as a strategic approach to agricultural development. This strategy aims to boost farm income, enhance productivity, and promote the sustainable use of natural resources (Sekhon and Kaur, 2004). In recent decades, the growing demand for fruits and vegetables—driven by rising incomes and shifting dietary preferences has placed pressure on traditional farming systems. These changes, alongside increasing food prices and concerns over declining food quality, have contributed to a reduction in the number of small-scale farmers. Consequently, there is a growing need to cultivate more productive and economically viable crops.

Vegetable cultivation, being labor-intensive, offers significant potential to generate employment and increase rural incomes (Weinberg and Lumpkin, 2006). Among these crops cabbage (Brassica oleracea var. botrytis) commonly referred to as cauliflower, stands out as one of the most important and widely consumed winter vegetables. Valued for its taste, culinary versatility, and nutritional content rich in vitamins C and K, fiber, and antioxidants—cauliflower plays a vital role in human diets worldwide.

Cauliflower is a biennial crop typically grown as an annual, and it is categorized into early, mid-season, and late varieties, depending on the planting and harvesting schedules. However, the cost of cultivation has been rising steadily due to increasing prices of essential inputs such as seeds, fertilizers, organic and chemical manures, irrigation, and labor.Globally, the production of cauliflower (including green variants like broccoli) is estimated

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at approximately 25.5 million metric tons. China and India dominate global output, together accounting for around 73% of total production. Other leading producers include the United States, Spain, Mexico, and Italy, with annual yields ranging between 0.4 to 1.3 million metric tons.In parallel with its advancements in horticulture, India has also made remarkable progress in cereal crop production. Notably, India has become the world's second-largest producer of rice, with output reaching an impressive 169.478 million tonnes in recent years. This milestone reflects the country's expanding agricultural capabilities and highlights the potential for similar success in high-value crop sectors like vegetables.

Cauliflower is a major winter vegetable crop in West Bengal, playing a vital role in enhancing rural livelihoods and contributing significantly to the state's agricultural economy. The marketing of cauliflower involves a complex network of stakeholders, including farmers, middlemen, commission agents, wholesalers, and retailers. The cauliflower marketing system in West Bengal is currently undergoing a phase of transformation. While traditional marketing practices continue to dominate, the emergence of Farmer Producer Organizations (FPOs), digital marketing platforms, and various government-led initiatives is paving the way for a more efficient and farmer-centric model. These developments offer promising prospects for better price realization, reduced post-harvest losses, and overall improvement in farmer welfare. To strengthen the cauliflower value chain further, it is essential to address critical infrastructure gaps particularly in storage, transportation, and cold chain facilities and to empower farmers with better market access and real-time price information.

II. OBJECTIVES OF THE STUDY

i)To estimate the cost of marketing of cauliflower in Chandrakona-2 Block of Paschim Medinipur district.
(ii) To analysis the market channel of cauliflowerinChandrakona-2 Block of Paschim Medinipur district.
iii) To estimate the marketing cost per quintal and measureof marketing efficiency of cauliflower.

III. DATABASE AND METHODOLOGY

The study utilizes primary data sources. Primary data were collected from households selected through a random sampling method. The Paschim Medinipur district in West Bengal was purposively chosen as the study area for conducting the field survey. Within this district, the Chandrakona-2 block was selected for detailed investigation.Recognizing that not all villages within the block share similar socio-economic characteristics, five villages were carefully chosen from the village list of the Chandrakona-2 block. These five villages were selected to capture the diversity in socio-economic conditions, soil types, and agricultural practices. A total of 16 households were randomly selected from each village, resulting in a sample of 80 households for the comprehensive survey. The reference period for the study is the financial year 2024–25.

Marketing Cost, Margin and Price Spread

The share of producer and price spread, including marketing costs and margins of middleman in cabbage marketing, were worked out using the formulas Acharya and Agarwal (2003). This formula we used in cauliflower marketing

Producer's Share in Consumer's Rupee

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

Where,
PS = Producer's Share in Consumer's Rupee
PF = Price of the producer received by the farmer
PC = Price of the produce paid by the consumer

Marketing Margins

The total margin, including absolute and percentage margin of intermediaries involved in cauliflower marketing, were estimated as under:

Absolute margin of ith middleman = PRi – (PPi + Cmi)

$$\text{Percentage margin of ith- middleman} = \frac{PRi - (PPi + Cmi)}{PRi} \times 100$$

.
Where,
PRi = Sale price of the i-th middleman
PPi = Purchase price of the i-th middlemen
Cmi = cost incurred on marketing by the i-th middleman

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Total Cost of Marketing

The total marketing cost of farmers and intermediaries computed as:

$C = CF + Cm1 + Cm2 + \ldots\ldots\ldots Cmn$

Where,

C = Total marketing cost

CF = Marketing cost of cauliflower grower

Cmn= cost incurred by the i-th middleman in the marketing of cauliflower

Modified Measure of Marketing Efficiency (MME)

MME was computed by employing the following formula suggested by Acharya and Agarwal (2003).

$MME = [RP / (MC + MM)] - 1$

$RP = FP + MC + MM$

Where,

MME = Modified measure of marketing efficiency

RP = Prices paid by the consumer

MC = Total marketing costs

MM = Net marketing margins, and

FP = Pieces received by the farmer

The higher the ratio is indicating the more marketing efficiency and vice-versa.

IV. RESULTS AND DISCUSSION

Analysis of Marketing Cost Components across Farm Sizes

Packing, transportation, and loading/unloading are the three largest components of the total marketing cost, together accounting for approximately 72% to 74% across all farm categories. These expenses represent the most significant share of marketing operations, indicating the areas where efficiency improvements could yield cost savings.

Packing Cost includes the expense of materials such as gunny bags, plastic crates, or bamboo baskets used for transporting the produce. It remains consistently high across all farm sizes, ranging from ₹6.12 to ₹6.65 per quintal, which constitutes around 24% to 25% of the total marketing cost. This uniformity suggests that packing is a critical and unavoidable cost for all producers, regardless of scale. Transportation Cost holds the highest or near-highest share in the marketing cost structure, ranging from ₹6.16 to ₹6.50 per quintal, or about 24.3% to 24.9%. However, medium-sized farms incur slightly lower transportation costs, likely due to the advantage of transporting in bulk or accessing more efficient logistics.

Loading and Unloading Charges are also significant, accounting for approximately 23% of the total cost across all farm categories. These costs are relatively stable and highlight the labor-intensive nature of this stage in the marketing process. Weighing Cost, though smaller in absolute terms, varies with farm size. It is highest in marginal farms at ₹2.50 per quintal (about 9.34% of their total marketing cost) and lowest in medium farms at ₹2.28 per quintal (around 9.15%). The decline in cost with increasing farm size may reflect better access to shared infrastructure or improved operational efficiency. Overall, total marketing cost is highest in marginal farms (₹26.78 per quintal), followed by small farms (₹25.94) and medium farms (₹24.93). (Table 1)This trend clearly indicates that larger farms benefit from economies of scale, leading to a reduction in per-unit marketing expenses.

Table1: Marketing Costs incurred by Cauliflower Growers per quintal

Particulars	Marginal		Small		Medium		Overall	
	Rs.	% Share	Rs.	% Share	Rs.	% Share	Rs.	% Share
Weighting Cost	2.50	9.34	2.43	9.37	2.28	9.15	2.15	8.47
Packing Charge	6.65	24.83	6.25	24.09	6.12	24.55	6.31	24.85
Cleaning and Grading	2.25	8.40	2.21	8.52	2.15	8.62	2.05	8.07
Loading and unloading charges	6.16	23.00	6.11	23.55	5.76	23.10	6.04	23.79
Transportation Cost	6.50	24.27	6.37	24.56	6.16	24.71	6.32	24.89
Damage and other charges	2.72	10.16	2.57	9.91	2.46	9.87	2.52	9.93
Total Marketing Cost	26.78	100.00	25.94	100.00	24.93	100.00	25.39	100.00

Source: Field Level Survey

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Marketing Costs Incurred by Wholesaler-Cum-Commission Agent

This table shows a comprehensive breakdown of the total marketing cost of ₹71.60 per quintal of cauliflower, as incurred by a wholesaler-cum-commission agent. The marketing cost encompasses all expenditures from the point of procurement at the farm gate to the final sale in the wholesale market. Each component is presented along with its absolute cost (₹/quintal) and its percentage share of the total cost, giving insights into the structure and distribution of marketing expenses. Among all the components, commission charges amounting to ₹25.75 (35.96%) represent the largest single expense, underscoring the significant role and cost burden of intermediaries in the marketing process. This high percentage reflects the standard practice in agricultural markets, where agents charge a fixed commission on the sale proceeds.

The second major cost is spoilage losses (₹13.60 or 18.99%), which highlights substantial post-harvest losses during handling, transportation, or storage. This figure points to the need for better cold chain infrastructure, efficient packaging, and timely transportation to reduce wastage. Loading and unloading charges (₹12.50 or 17.46%) also contribute notably to the total cost, emphasizing the labor-intensive nature of vegetable marketing, especially for bulky and perishable crops like cauliflower. This cost includes both loading at the farm level and unloading at the market or storage facilities.

The combined cost of packing (₹6.80 or 9.50%), cleaning, and grading (₹5.75 or 8.03%) comes to ₹12.55 or 17.53%, reflecting the importance of post-harvest handling in ensuring produce quality, market appeal, and compliance with buyer standards. On the other hand, minor cost components such as weighing (₹2.50 or 3.49%), market fee (₹2.00 or 2.79%), and miscellaneous expenses (₹2.70 or 3.77%) collectively account for less than 10% of the total marketing cost. These include routine administrative charges, minor purchases, tips, and communication expenses, which are essential but relatively less burdensome.(Table 2)

Table 2: Marketing Costs incurred by Wholesaler-Cum-Commission Agent per quintal of cauliflower

Particulars	Cost(Rs / qtl)	Percent to total cost
Weighing Cost	2.50	3.49
Packing Charge	6.80	9.50
Cleaning and Grading	5.75	8.03
Loading and unloading charges	12.50	17.46
Market fee	2.00	2.79
Commission Charges	25.75	35.96
Spoilage	13.60	18.99
Miscellaneous	2.70	3.77
Total marketing cost	71.60	100.00

Source: Field Level Survey

Marketing Costs Incurred by Retailers

The table-3 presents a comprehensive breakdown of the total marketing cost of ₹66.00 per quintal incurred by retailers during the sale of cauliflower. These marketing costs encompass all operational and handling expenses from the point the produce is received from wholesalers or producers until it reaches the final consumer. Each component is listed with its absolute cost (₹/quintal) as well as its percentage share of the total cost, offering insight into the cost structure faced by vegetable retailers.

The most significant cost item is spoilage, amounting to ₹33.64 per quintal (51.03%), which accounts for more than half of the total marketing cost. This high percentage reflects the extreme perish ability of cauliflower and the challenges faced by retailers in preserving freshness over time. In the absence of adequate cold storage, timely turnover, or efficient inventory management, a considerable portion of the stock is lost to decay or damage before it can be sold.

The second-highest cost is packing charges, at ₹12.80 (19.44%), indicating that retailers invest heavily in packaging to protect the product, improve presentation, and attract buyers. Good packaging not only extends shelf life to some extent but also enhances consumer confidence in quality. Storage costs, which account for ₹7.55 or 11.39%, further emphasize the burden of maintaining freshness. These may include rent for cold storage units, refrigeration, or storage space at retail outlets. Although less than spoilage, this cost still represents a crucial part of the marketing effort. Loading and unloading charges (₹6.50 or 9.87%) and cleaning and grading (₹2.75 or 4.18%)(Table 3) are essential operational tasks that ensure smooth handling and maintain product hygiene. While these costs are lower in proportion, they are indispensable for maintaining quality during the selling process. Miscellaneous expenses (₹2.75 or 4.10%) include small but necessary day-to-day costs such as electricity, water, cleaning supplies, local transport within the market, and minor administrative expenses.

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Table 3: Marketing Costs incurred by Retailers per quintal cauliflower

Particulars	Cost (Rs / qtl)	Percent to total cost
Packing Charge	12.80	19.44
Cleaning and Grading	2.75	4.18
Loading and unloading charges	6.50	9.87
Storage Cost	7.55	11.39
Spoilage	33.64	51.03
Miscellaneous	2.75	4.10
Total marketing cost	66.00	100.00

Source: Field Level Survey

Cost of Production, Marketing Cost and net returns

The average gross profit from cauliflower cultivation per hectare was calculated using the prevailing market price of ₹900.91 per quintal, specifically for marginal farmers. The analysis of cost and returns across different farm sizes reveals important insights into the economic efficiency of cauliflower production. The cost of production per quintal is relatively stable across all farm categories, ranging from ₹743.76 (small farms) to ₹750.80 (medium farms). Small farms exhibit slightly lower production costs, indicating better input utilization and possibly more efficient use of family labor or local resources. Marketing costs decline slightly with increasing farm size, reflecting the advantages of scale. Marginal farms incur the highest marketing cost at ₹26.78 per quintal, while medium farms face the lowest at ₹24.93 per quintal. This trend may be attributed to better bargaining power, bulk marketing, access to transportation, or greater market connectivity available to larger farms. Marginal farmers often rely on intermediaries and local traders, which can increase marketing expenses.

The total cost per quintal which combines production and marketing costs is lowest for small farms (₹769.70) and highest for marginal farms (₹776.33). This highlights the cost efficiency of small farms, possibly due to closer monitoring, lower hired labor dependency, and more targeted use of inputs. Despite the differences in cost structure, the gross return per quintal remains relatively uniform, ranging from ₹900.91 (marginal) to ₹907.20 (small). This indicates a stable market price for cauliflower during the survey period, unaffected by farm size. The net return per quintal, which represents the actual profit after all expenses, is highest for Small farms: ₹137.50 Followed by medium farms: ₹129.75 and marginal farms: ₹124.58 this shows that small farms are the most profitable, achieving the best balance between production efficiency and marketing cost control. Though marginal farms receive similar gross returns, their higher marketing costs significantly reduce their net profitability.

Table 4: Cost of Production, Marketing Cost and Net returns from per quintal Cauliflower production

Category of Farm	Total cost of Production per quintal	Marketing cost per quintal	Total cost per quintal	Gross Return	Net return
Marginal	749.55	26.78	776.33	900.91	124.58
Small	743.76	25.94	769.70	907.20	137.50
Medium	750.80	24.93	775.73	905.48	129.75
All Farm	748.74	25.39	774.13	905.38	131.25

Source: Field Level Survey

Marketing channels, marketing margin and price spread in relation to marketing of cauliflower

In the study area, most of the cauliflower growers are marginal and small and the total production is used to meet the consumption need of local people or nearby towns. Therefore, farmers sell either directly to consumers or itinerant traders purchase cauliflower from producers and sell in the local market to ultimate consumers. Small quantity of cauliflower is transported to nearby districts and sold through wholesalers. In short, the total cauliflower production of the district is marketed largely through the following three channels:

Channel I : Cabbage grower to Consumer
Channel II : Cabbage grower to Petty trader/ Retailer to Consumer
Channel III : Cabbage grower to Petty trader/ Commission agent to Wholesaler to Retailer to Consumer

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Table: 6, Estimation of marketing costs, margins and producer's share in consumer rupee identified in cauliflower marketing channels

Particulars	Channel-1	Channel-2	Channel-3
Price of cauliflower at farm gate	905.00	905.00	905.00
Cost incurred by farmers	25.00		11.00
Selling price of the farmer	988.00		942.00
Net margin of the farmer	58.00		26.00
Purchase price of petty trader/ commission agent			942.00
Cost incurred by petty trader/ commission agent			66.00
Selling price of cauliflower to wholesaler			1050.00
Net margin of the petty trader			42.00
Purchase price of wholesaler from petty trader/ commission agent			1050.00
Cost incurred by the wholesaler			72.00
Selling price of wholesaler to petty trader/ commission agent			1148.00
Net margin of the wholesaler			26
Purchase price of petty trader/retailer		905.00	1148.00
Cost incurred by petty trader/retailer		66.00	30.00
Selling price of petty trader to consumer		1075.00	1230.00
Net margin of the petty trader/retailer		104.00	52.00
Purchase price of the consumer	988.00	1075.00	1230.00
Producer's share in the consumers' price (percent)	97.46	84.18	75.68
Price spread or gross marketing margin	83.00	170.00	305.00
Total cost of marketing	25.00	66.00	168
Net marketing margin	58.00	104.00	137

Source: Field Level Survey

Table 6 presents a comprehensive analysis of the distribution of marketing costs, margins, and the producer's share in the consumer's rupee across three identified marketing channels for cauliflower. The data highlights the economic implications for farmers and intermediaries at various stages of the marketing process.

In Channel I (Direct Marketing), farmers sell cauliflower directly to consumers, bypassing all intermediaries. This channel yields the highest benefit for producers, with a net additional income of Rs. 58 per quintal, after incurring a marketing cost of Rs. 25 per quintal. The consumer purchase price in this channel is Rs. 988 per quintal (Rs. 9.88 per kg), and the producer's share in the consumer's rupee is the highest at 97.46%. This clearly reflects that direct marketing not only maximizes farmer profits but also offers the lowest price to consumers.

In Channel II, local petty traders or itinerant retailers purchase cauliflower directly from farmers at the farm gate and sell it in the local market. These traders perform both procurement and retail functions, earning a substantial net margin of Rs. 104 per quintal, while incurring Rs. 66 per quintal in marketing costs. The consumer purchase price increases to Rs. 1075 per quintal (Rs. 10.75 per kg), and the producer's share drops to 84.18%. Although farmers still benefit, a significant portion of the consumer's rupee is now absorbed by the intermediary.

In Channel III, the supply chain becomes more complex, involving multiple intermediaries: commission agents, wholesalers, and retailers. Farmers sell cauliflower at Rs. 942 per quintal, incurring a minimal cost of Rs. 11, and earn a modest margin of Rs. 26 per quintal. The product then passes through a commission agent (net margin: Rs. 42), a wholesaler (net margin: Rs. 26), and a retailer (net margin: Rs. 52), with each adding their own marketing cost (Rs. 66, Rs. 72, and Rs. 30 respectively). Consequently, the final retail price paid by consumers rises to Rs. 1230 per quintal (Rs. 12.30 per kg). In this channel, the producer's share declines sharply to 75.68%, while the total marketing cost escalates to Rs. 168 per quintal, and the net marketing margin to Rs. 137.

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V. CONCLUSION

Packing, transportation, and loading/unloading are the three largest components of the total marketing cost, together accounting for approximately 72% to 74% across all farm categories. These expenses represent the most significant share of marketing operations, indicating the areas where efficiency improvements could yield cost savings. Loading and Unloading Charges are also significant, accounting for approximately 23% of the total cost across all farm categories. These costs are relatively stable and highlight the labor-intensive nature of this stage in the marketing process. Weighing Cost, though smaller in absolute terms, varies with farm size. It is highest in marginal farms. Packing Cost includes the expense of materials such as gunny bags, plastic crates, or bamboo baskets used for transporting the produce. It remains consistently high across all farm sizes, ranging from ₹6.12 to ₹6.65 per quintal, which constitutes around 24% to 25% of the total marketing cost. Overall, total marketing cost per quintal is highest in marginal farms followed by small farms and medium farms this trend clearly indicates that larger farms benefit from economies of scale, leading to a reduction in per-unit marketing expenses.

Out of the total marketed surplus, the main share was sold through wholesalers-cum-commission agents, followed by wholesalers, retailers and village traders to cabbage growers. Marketing costs were relatively higher on smaller farms than on large farms. Among the various marketing costs, transportation costs ranked first with 33.11 per cent, followed by loading and unloading costs, packaging costs, damage costs and other costs, weighing fees and cleaning fees. The marketing cost on commission charge was the highest for wholesalers-cum-commission agents. The higher marketing costs may be due to higher commission costs incurred by wholesalers as buyers when purchasing in distance markets. Among the various costs borne by the retailer, the maximum share of spoilage was observed, i.e., 51 per cent of the total marketing costs. It can also be seen that higher landowners had higher returns than smaller landowners. The reason was that large farmers sold their market surpluses in distant markets where they realized higher prices. More than 50 per cent of cauliflower has moved from the producer to the wholesaler-cum-commission agent to the consumers. It was found that the producer's share was 75.68 per cent of the price paid by cauliflower consumers. The modified marketing efficiency was greater than unity (1.60).

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