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Study on marketing of coconut (*Cocos nucifera* L.) in eluru district of Andhra Pradesh

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Abstract

The present study, entitled “Study on Marketing of Coconut (*Cocos nucifera* L.) in Eluru District of Andhra Pradesh,” was conducted to examine the socio-economic characteristics of coconut growers, assess the prevailing marketing channels, estimate marketing costs, price spread, producer’s share in the consumer’s rupee, and marketing efficiency, and to identify the major constraints affecting coconut marketing. The study was based on primary data collected during 2025-2026 from 120 coconut growers and selected market intermediaries using a structured interview schedule. The results indicated that coconut cultivation in the study area is largely dominated by small and semi-medium farmers, with the majority of respondents belonging to the middle-age group (31-50 years). Farmers exhibited a moderate level of education, with a significant proportion having completed secondary and higher education, which supported better adoption of improved cultivation and marketing practices. While agriculture remained the principal occupation, several respondents diversified their income through allied and non-farm activities such as dairy, business, and service. Three major marketing channels were identified: Producer → Consumer (Channel I), Producer → Retailer → Consumer (Channel II), and Producer → Wholesaler → Retailer → Consumer (Channel III). Among these, Channel II was the most widely adopted due to its accessibility and convenience. However, Channel I offered higher profitability but remained limited due to inadequate direct market linkages, whereas Channel III was mainly preferred for bulk marketing and distant market supply. Marketing cost and price spread analysis revealed that marketing costs increased with the involvement of intermediaries, with Channel I recording the lowest cost and Channel III the highest. The producer’s share in the consumer’s rupee was highest in Channel I (96.23%) and lowest in Channel III (74.73%), indicating that shorter marketing channels ensure better price realization for farmers. Marketing efficiency was also highest in Channel I (26.53), followed by Channel II (7.12), and lowest in Channel III (3.95), demonstrating a decline in efficiency with increased channel length. The major constraints reported by farmers included price fluctuation, high transportation costs, lack of storage facilities, middlemen exploitation, and inadequate market information, along with issues related to high input costs, limited processing facilities, and poor infrastructure. The study concludes that strengthening direct marketing, improving market infrastructure, promoting Farmer Producer Organizations (FPOs), expanding storage and processing facilities, and ensuring timely dissemination of market information are essential for enhancing coconut marketing efficiency and improving farmers’ income in Eluru district.

Keywords: Coconut, marketing channels, price spread, marketing efficiency, producer’s share, constraints, Eluru district

Introduction

Coconut (*Cocos nucifera* L.) is an important plantation crop widely cultivated in tropical regions and plays a significant role in India’s agricultural economy due to its diverse uses and high commercial value. Commonly referred to as the “tree of life,” the coconut palm is unique in that almost every part of the plant including the nut, husk, shell, leaves, and trunk can be utilized for productive purposes (Food and Agriculture Organization, 2020) [14, 15]. It supports several agro-based industries by supplying raw materials for products such as edible oil, copra, coconut water, coconut milk, desiccated coconut, and coir-based goods. Consequently, coconut cultivation contributes substantially

to employment generation and rural livelihood security, particularly among small and marginal farmers (Coconut Development Board, 2021) [9]. In addition, coconut provides nutritional benefits as it contains essential fatty acids, vitamins, and minerals, while by-products such as oilcake and coir further strengthen its economic importance in rural areas (Food and Agriculture Organization, 2020) [14, 15].

At the global level, coconut is cultivated in more than 90 countries, covering approximately 12-13 million hectares with annual production exceeding 60 million tonnes. Major coconut-producing countries include Indonesia, the Philippines, and India. The global coconut sector has shown steady expansion due to increasing consumer preference for

coconut-based products such as coconut oil, coconut water, and other value-added items (FAOSTAT, 2022; Food and Agriculture Organization, 2020) ^[13, 14, 15]. The growing demand for processed products, including virgin coconut oil and coconut milk, has strengthened international trade and emphasized the need for quality standards and value addition. However, challenges such as price instability, inadequate infrastructure, and inefficiencies in marketing systems continue to affect the performance of the coconut sector.

India ranks among the leading coconut-producing countries, with production estimated at around 13-14 million tonnes and cultivation spread across approximately 2.1-2.2 million hectares (FAOSTAT, 2022; NHB, 2021) ^[13]. Major coconut-growing states include Kerala, Tamil Nadu, Karnataka, and Andhra Pradesh. Coconut plays an important role in income generation, employment, and nutritional security, especially in the southern and coastal regions of the country (Nayar, 2016; DebMandal & Mandal, 2011) ^[36, 10]. Despite its significance, coconut marketing in India is often characterized by the involvement of multiple intermediaries such as traders, commission agents, wholesalers, and retailers. This multi-layered marketing structure increases marketing costs and widens the price gap between producers and consumers, thereby reducing farmers' share in the final consumer price (Acharya & Agarwal, 2019) ^[3]. Furthermore, constraints such as inadequate storage facilities, limited processing infrastructure, lack of timely market information, and frequent price fluctuations negatively affect marketing efficiency.

In Andhra Pradesh, coconut cultivation has expanded steadily due to favourable climatic conditions, improved irrigation facilities, and better farm management practices. The state produces around 1.5-1.8 billion nuts annually, with productivity levels often higher than the national average (Coconut Development Board, 2020; NHB, 2021) ^[7, 8]. Within the state, Eluru district has emerged as an important coconut-producing region due to its fertile soils and reliable irrigation sources. Coconut cultivation in the district provides a stable source of income and supports diversified farming systems. However, coconut growers face marketing-related challenges such as dependence on intermediaries, seasonal price variation, high transportation costs, and inadequate infrastructure, which collectively reduce their profitability and bargaining power (Acharya & Agarwal, 2019) ^[3].

Improving the efficiency of the coconut marketing system is essential to enhance farmers' income and ensure better price realization. Measures such as strengthening storage and processing facilities, improving transportation networks, promoting Farmer Producer Organizations (FPOs), and ensuring timely access to market information can help reduce marketing inefficiencies. Encouraging direct marketing channels can also increase the share of farmers in the consumer's expenditure. These interventions are particularly relevant for districts like Eluru, where coconut cultivation is a key component of rural livelihoods.

Objectives of the study

1. To study the socio-economic status of coconut growers in the study area.
2. To identify the existing marketing channels involved in

the marketing of Coconut.

3. To evaluate the marketing cost, price spread, producers share in consumers rupee and marketing efficiency.
4. To analyze the constraints in the marketing of coconuts and to suggest suitable remedial measures.

Research methodology

The present study on coconut marketing in Eluru district was conducted using a systematic methodological framework that included the selection of the study area, sampling design, sources of data, and analytical procedures. To ensure adequate representation of coconut growers and other key participants in the marketing system, a multi-stage stratified random sampling technique was adopted.

The sampling procedure was carried out in a sequential manner. In the first stage, Eluru district was purposively selected due to its importance in coconut cultivation in Andhra Pradesh, supported by favourable agro-climatic conditions, fertile soils, and well-established irrigation facilities. In the second stage, two mandals, viz., Bhimadole and Dwaraka Tirumala, were selected based on their relatively larger area under coconut cultivation and variations in marketing practices. Bhimadole Mandal is known for commercial coconut production and better market accessibility, whereas Dwaraka Tirumala Mandal largely represents regions dominated by small and marginal farmers practicing relatively traditional marketing systems. This selection facilitated the inclusion of diverse production and marketing conditions within the district.

In the third stage, a total of ten villages (five villages from each selected Mandal) were randomly chosen by considering the extent of coconut cultivation and market participation. From these villages, 120 coconut growers were selected randomly for detailed investigation. In the fourth stage, the selected respondents were classified into different farm size categories namely marginal, small, semi-medium, medium, and large based on landholding size, to enable comparative assessment of cultivation practices, marketing behaviour, costs, and returns across farmer groups.

In the fifth stage, key market centres and intermediaries were included to analyze marketing channels, marketing costs, price spread, producers share in consumers rupee and marketing efficiency. Two major market centres, namely Eluru Regulated Market (APMC) and Bhimadole local market, were selected to represent both organized and unorganized marketing systems. Further, market intermediaries such as commission agents, wholesalers, retailers, and processors were randomly selected from these markets. A representative sample of these market functionaries was interviewed to obtain detailed information on marketing operations, costs incurred, margins earned, and price realization under different marketing channels.

The study area, Eluru district, is located in the coastal region of Andhra Pradesh and is recognized for its agricultural and horticultural significance. The region is characterized by fertile alluvial soils, a tropical climate, and adequate irrigation resources, making it suitable for coconut cultivation. Coconut, being an important perennial crop in the district, contributes substantially to farm income and rural livelihood security. The produce is marketed through a network of local traders, regulated markets, and processing units.

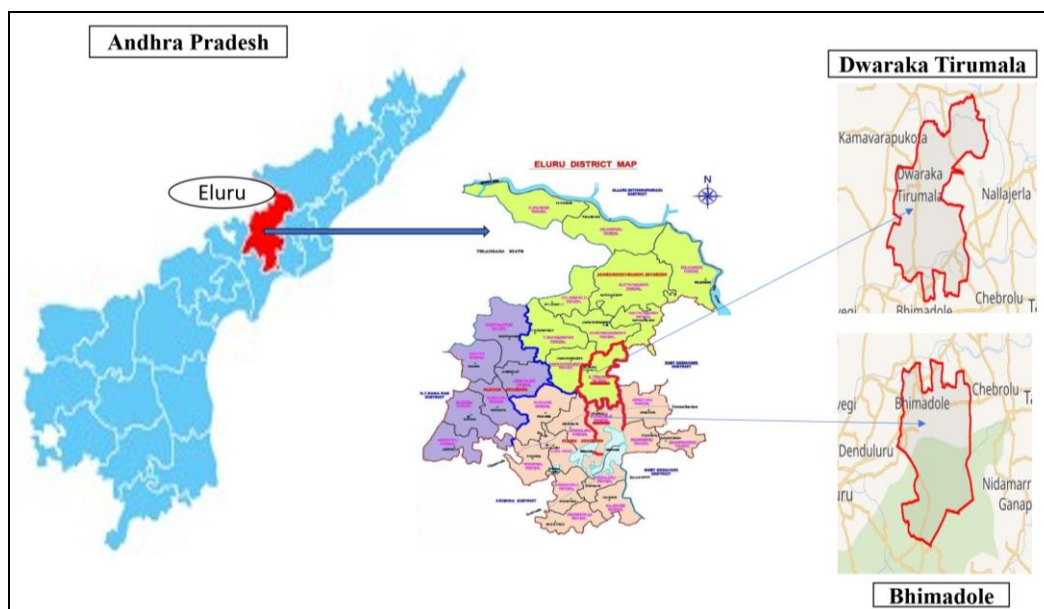


Fig 1: Map of the study area, Bhimadole and Dwaraka Tirumala blocks in Eluru district of Andhra Pradesh

The study was based on both primary and secondary data for the agricultural year 2025-2026. Primary data were collected through personal interviews with farmers and market intermediaries using a structured and pre-tested schedule. The information gathered included socio-economic characteristics, landholding patterns, cropping systems, cost of cultivation, yield levels, marketing channels, marketing costs and margins, price received, and constraints faced in marketing. Secondary data were obtained from official sources such as the Department of Horticulture, APMC records, government publications, and relevant databases. These data were utilized to analyze trends in area, production, productivity, and marketing aspects of coconut. Overall, the methodological approach ensured comprehensive coverage of all relevant stakeholders and provided a reliable basis for evaluating the structure and efficiency of coconut marketing in the study area.

Analysis of data

To accomplish the specific objectives of the study, appropriate statistical tools and analytical techniques were employed in accordance with the nature and extent of the data collected. Both descriptive and quantitative methods were used to ensure systematic analysis and meaningful interpretation.

Analytical tools

The following statistical tools and techniques will be used in analysis of data and interpretation of result.

Formula according to objectives:

1. To study the socio-economic status of coconut growers in the study area.

a) Chi-square test

A chi-square (χ^2) test is a statistical test used to determine whether there is a significant difference between observed frequencies and expected frequencies. It helps assess how well a theoretical distribution (model) fits the actual observed data. The data used for the chi-square test should

be random, mutually exclusive, independent, and based on a sufficiently large sample size.

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Where:

- χ^2 = Chi-square statistic
- O = Observed frequency (observed value)
- E = Expected frequency (expected value)
- $\sum$ = Summation over all categories

2. To identify the existing marketing channels involved in the marketing of coconut.

a. Mean

The mean (also called the arithmetic average) is obtained by dividing the sum of all observations by the total number of observations. It is one of the most commonly used measures of central tendency in statistics.

Mean formula (Ungrouped data)

$$\bar{x} = \frac{\sum x}{n}$$

Where:

- $\bar{x}$ = arithmetic mean
- $\sum x$ = sum of all observations
- n = total number of observations

Mean formula (Grouped data)

$$\bar{x} = \frac{\sum fx}{N}$$

Where:

- $\bar{x}$ = mean of the data

- f = frequency of each class or observation
- x = value (or class midpoint)
- $N = \sum f$ = total frequency

Hence, the mean represents the average value of all data points in a dataset.

b. Median

The median is the value that divides a dataset into two equal halves, such that 50% of the observations lie below the median and 50% lie above it. To determine the median, the data must first be arranged in ascending or descending order.

Let n be the total number of observations.

If n is odd

$$\text{Median} = \left(\frac{n+1}{2}\right)^{\text{th}} \text{ term}$$

If n is even

The median is the average of the two middle terms:

$$\text{Median} = \frac{\left(\frac{n}{2}\right)^{\text{th}} \text{ term} + \left(\frac{n}{2} + 1\right)^{\text{th}} \text{ term}}{2}$$

Thus, for an even number of observations, the median is the mean of the $\frac{n}{2}$ th term and the $\left(\frac{n}{2} + 1\right)$ th term.

c. Mode

The mode is defined as the value or values in a dataset that occur with the highest frequency. It represents the most frequently observed value(s) and can be particularly useful in identifying the most common or typical value in the data. In cases where multiple values have the same highest frequency, the dataset is considered multimodal, and all such values are modes. If no value repeats, the dataset has no mode.

Mode formula (for grouped data)

$$\text{Mode} = L + \left[\frac{(f_m - f_1)}{(f_m - f_1) + (f_m - f_2)} \right] \times h$$

Where:

- L = lower limit of the modal class
- h = class interval (size of the class)
- f_m = frequency of the modal class
- f_1 = frequency of the class preceding the modal class
- f_2 = frequency of the class succeeding the modal class

3. To evaluate marketing cost, price spread, producer's share in consumer's rupee, and marketing efficiency

a. Marketing cost

Marketing cost refers to the total cost incurred by the producer and other market intermediaries (middlemen) in

the process of moving the commodity from the farm to the final consumer. It includes expenses such as loading and unloading, transportation, packing, storage, weighing, commission charges, and other handling costs.

$$C = C_F + C_{M1} + C_{M2} + C_{M3} + \dots + C_{Mn}$$

Where

- C = Total marketing cost of the commodity
- C_F = Cost incurred by the producer from the time the produce leaves the farm until it is sold
- $C_{M1}, C_{M2}, \dots, C_{Mn}$ = Cost incurred by the 1st, 2nd, ... nth middleman in the marketing process (Acharya and Agarwal, 2011) ^[2]

b. Price spread

Price spread is defined as the difference between the price paid by the consumer and the net price received by the producer. It includes both marketing costs and marketing margins of intermediaries.

$$\text{Price spread} = P_C - P_F$$

Where:

- P_C = Price paid by the consumer
- P_F = Net price received by the farmer (producer) (Kohls and Uhl, 2002)

c. Producers share in consumer's rupee

Producer's share refers to the percentage of the consumer's price that is actually received by the producer.

$$PS = \left(\frac{P_F}{P_C} \right) \times 100$$

Where

- PS = Producer's share in consumer's rupee (%)
- P_F = Net price received by farmer
- P_C = Price paid by consumer

Alternatively, if marketing cost and margin are known:

$$PS = \left[\frac{(P_C - (C + M))}{P_C} \right] \times 100$$

Where:

- C = Total marketing cost
- M = Total marketing margin (Acharya and Agarwal, 2011) ^[2]

e. Marketing Efficiency (Acharya and Agarwal Method)

Marketing efficiency refers to the effectiveness of a marketing system in delivering goods from producer to consumer at the lowest possible cost while ensuring fair returns to farmers and intermediaries.

$$ME = \frac{P_F}{C + M}$$

Where:

- ME = Marketing efficiency
- P_F = Net price received by the farmer
- C = Total marketing cost
- M = Total marketing margin

A higher value of ME indicates a more efficient marketing system.

4. To analyze the constraints in the marketing of coconuts and to suggest suitable remedial measures Garrett's ranking:

Garrett's ranking technique is used to identify the most significant factors influencing the respondents by converting ranks into scores and then ranking the factors based on mean scores.

The formula for converting ranks into percent position is given as:

$$\text{Percent Position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where:

- R_{ij} = Rank given to the i th factor by the j th respondent
- N_j = Total number of factors ranked by the j th respondent

The percent position corresponding to each rank is then converted into Garrett scores by referring to the table provided by Garrett and Woodworth (1969). The scores obtained for each factor from all respondents are summed and the mean score is calculated. Finally, the factors are ranked by arranging the mean scores in descending order, and the factor with the highest mean score is considered the most important.

Results and discussion

The results obtained from the study on the marketing of coconut in Eluru district. Data were collected from 120 coconut growers and market functionaries using a structured schedule. The results are presented under the following sections:

Socio-economic profile

Table 1: Socio-economic profile of selected coconut growers in the study area

S. No.	Particulars	Value	Calculation	Percentage
1.	Male members	2.90	$(2.90 \div 6.50) \times 100$	44.62
2.	Female members	2.30	$(2.30 \div 6.50) \times 100$	35.38
3.	Children	1.30	$(1.30 \div 6.50) \times 100$	20.00
	Total	6.50	—	100

The findings presented in table 1 indicated that, socio-economic profile of the sample households indicates a relatively balanced family composition, with male members accounting for 44.62%, female members 35.38%, and children 20% of the total family size. This structure reflects the availability of adequate family labour for farm-related activities. In general, male members are predominantly

engaged in physically demanding operations such as harvesting and transportation, whereas female members play a crucial role in post-harvest management, including drying, sorting, and assisting in marketing-related activities. Such a division of labour contributes to the efficient functioning of farm operations and minimizes dependence on hired labour. The findings indicate a well-distributed household workforce, wherein male members primarily undertake labour-intensive activities, while women provide substantial support in processing and marketing-related operations.

Table 2: Educational status of selected coconut growers (n = 120)

S. No.	Education Level	Number	Percentage
1.	Illiterate	18	15.00
2.	Primary	32	26.67
3.	Secondary	45	37.50
4.	College	25	20.83
	Total	120	100

Study results from table 2 revealed that, educational profile of coconut growers in Eluru District indicates that a considerable proportion of farmers (37.50%) have attained secondary-level education, followed by those with primary education (26.67%) and college education (20.83%), while 15% of the respondents are illiterate. Farmers with higher educational attainment generally possess better awareness of improved cultivation practices, prevailing market prices, and various government support schemes, enabling them to adopt informed production and marketing decisions. Conversely, illiterate farmers often face constraints in accessing timely market information and tend to have lower bargaining capacity in market transactions, which may adversely influence their income realization.

Occupational pattern

Table 3: Occupational pattern of selected coconut growers (n = 120)

S. No.	Occupation	Number	Percentage (%)
1.	Agriculture only	48	40.00
2.	Agriculture + Dairy	28	23.33
3.	Agriculture + Business	24	20.00
4.	Agriculture + Service	20	16.67
	Total	120	100

The results presented in table 3 shows that, occupational pattern of the respondents reveals that 40% of the farmers depend exclusively on agriculture, whereas the remaining farmers supplement their agricultural income through dairy farming, business, or service-related activities. This occupational diversification reflects a deliberate strategy for risk reduction and income stabilization. Although coconut cultivation, being a perennial enterprise, provides relatively continuous returns, the inclusion of allied and non-farm activities enables farmers to mitigate the effects of price volatility and market-related uncertainties. Farmers engaged in multiple occupations generally exhibit greater financial security and are better positioned to invest in improved production inputs and efficient marketing practices. Moreover, diversification enhances the overall economic strength of farm households, facilitating the adoption of innovations such as improved storage facilities, better

transportation arrangements, and direct marketing channels. Thus, occupational diversification emerges as an important factor contributing to improved livelihood security and resilience among coconut growers.

Age characteristics

Table 4: Age distribution of selected coconut growers (n = 120)

S. No.	Age group	Number	Percentage (%)
1.	18-30	22	18.33
2.	31-50	65	54.17
3.	Above 50	33	27.50
Total		120	100

The results presented in table 4 revealed that, age distribution of the selected coconut growers is presented in Table 4. The findings indicate that the majority of

respondents (54.17%) belong to the middle-age group (31-50 years), followed by 27.50% in the above 50 years category. The young age group (18-30 years) constitutes only 18.33% of the total sample. The dominance of middle-aged farmers suggests that coconut cultivation is largely managed by individuals who possess both farming experience and active involvement in decision-making. Younger farmers, though fewer in number, are generally more inclined towards adopting modern technologies and innovative marketing approaches such as digital platforms and direct marketing channels. In contrast, older farmers tend to rely on conventional cultivation and marketing practices due to their familiarity with traditional systems and comparatively lower adaptability to emerging market strategies.

Farm size and area under Coconut

Table 5: Farm size and area under coconut of selected growers (n = 120)

S. No.	Category	No.	Avg. area (ha)	Coconut area (ha)
1.	Marginal (<1 ha.)	32	0.80	0.60
2.	Small (1-2 ha.)	38	1.70	1.20
3.	Semi-Medium (2-4 ha.)	25	3.50	2.50
4.	Medium (4-10 ha.)	15	5.80	4.00
5.	Large (>10 ha.)	10	9.50	7.00
Total		120	3.06	2.66

The analysis of farm size in table 5 indicates that coconut cultivation is undertaken across all categories of farmers, with small and semi-medium farmers constituting the major share of the respondents. The overall average cultivated landholding was found to be 3.06 hectares, of which 2.66 hectares were allocated to coconut cultivation. This clearly demonstrates that coconut serves as a predominant crop in the study area and plays a vital role in enhancing farm income. Although marginal and small farmers contribute significantly to total coconut production due to their numerical dominance, medium and large farmers generate a comparatively higher marketable surplus as a result of their larger landholdings. Farmers with larger holdings generally have better access to production resources such as irrigation facilities, fertilizers, improved planting material, and farm machinery, which supports higher productivity and output levels. Conversely, small farmers depend largely on family labour and adopt low-cost cultivation practices to manage farm operations. These differences across farm size categories highlight the importance of implementing targeted and category-specific strategies to improve productivity, profitability, and overall livelihood outcomes.

Marketing channels of coconut

The study identified three prominent marketing channels for coconut: (i) direct sale to consumers, (ii) sale through retailers, and (iii) sale through wholesalers followed by retailers. Among these, the channel involving retailers was found to be the most widely adopted, primarily due to its ease of access, convenience, and the assurance of quick disposal of produce. Farmers prefer this channel as it involves relatively less time, effort, and risk compared to other marketing options. Although direct marketing enables farmers to obtain higher returns by eliminating intermediaries, its adoption remains limited owing to inadequate infrastructure, lack of organized market linkages,

and limited access to consumers. The channel involving wholesalers is mainly utilized for bulk transactions and for supplying produce to distant markets; however, the presence of multiple intermediaries increases marketing costs and reduces the producer's share in the consumer's rupee. Overall, the findings suggest that shorter marketing channels are relatively more advantageous, as they enhance farmers' price realization and minimize marketing expenses.

- **Channel I:** Producer → Consumer
- **Channel II:** Producer → Retailer → Consumer
- **Channel III:** Producer → Wholesaler → Retailer → Consumer

Marketing cost

Table 6: Marketing cost in different channels (Rs. /1000 nuts)

S. No.	Cost Component	Channel I	Channel II	Channel III
1.	Packing	120	150	200
2.	Transport	200	300	450
3.	Labor	100	150	200
4.	Market Charges	50	80	120
5.	Commission	—	—	250
Total cost		470	680	1220

The study findings of marketing costs in table 6 reveals that expenses rise proportionately with an increase in the number of intermediaries involved in the marketing chain. Channel I (direct sale to consumers) incurs the lowest marketing cost due to minimal handling operations and the absence of commission charges. Channel II involves relatively moderate costs as the participation of retailers adds expenses related to handling and distribution. In contrast, Channel III records the highest marketing cost owing to greater expenditure on transportation, labour, storage, and commission charges associated with multiple intermediaries. The escalation in marketing cost is largely

influenced by longer market distances, repeated handling at various stages, and the inclusion of several market functionaries. Higher marketing costs ultimately reduce the net returns realized by farmers and reflect inefficiencies within the marketing system. Therefore, minimizing marketing expenses through improved infrastructure, cooperative marketing mechanisms, and promotion of direct marketing channels can substantially enhance farmers' profitability.

Price spread

Table 7: Price spread in different marketing channels (Rs. /1000 nuts)

S. No.	Particulars	Channel I	Channel II	Channel III
1.	Producer Price	12000	11500	11000
2.	Marketing Cost	470	680	1220
3.	Margin	—	1200	2500
4.	Consumer Price	12470	13380	14720
5.	Price Spread	470	1880	3720

Table 8: Producer share (%) in consumer's Rupee

S. No.	Channel	Producer Price (Rs.)	Consumer Price (Rs.)	Share (%)
1.	Channel I	12000	12470	96.23
2.	Channel II	11500	13380	85.95
3.	Channel III	11000	14720	74.73

The study findings from table 8 reveals that, producer's share in the consumer's rupee is highest under the direct marketing channel (96.23%) and declines substantially in channels involving intermediaries. This indicates that farmers realize greater returns when they sell produce directly to consumers. The inclusion of market intermediaries such as retailers and wholesalers reduces the producer's share due to the addition of marketing costs and profit margins at each stage of the supply chain. Enhancing the producer's share requires strengthening direct marketing mechanisms, encouraging the formation and functioning of Farmer Producer Organizations (FPOs), and improving farmers' bargaining capacity. Collective marketing approaches can enable farmers to negotiate better prices, minimize reliance on middlemen, and ultimately improve their overall income. Overall, the findings confirm that the producer's share decreases with an increase in the number of intermediaries.

Marketing efficiency

Table 9: Marketing efficiency of different channels

S. No.	Channel	Value	Cost + Margin	Efficiency
1.	Channel I	12470	470	26.53
2.	Channel II	13380	1880	7.12
3.	Channel III	14720	3720	3.95

The results presented in table 9 indicates that, marketing efficiency is highest in the direct marketing channel and declines progressively with an increase in the number of intermediaries. Higher marketing efficiency reflects effective utilization of resources, lower marketing costs, and improved price realization relative to the value of the commodity marketed. Accordingly, Channel I emerges as the most efficient channel due to minimal marketing costs

The price spread in different marketing channels in table 7 reveals that the gap between the price received by farmers and the price paid by consumers increases considerably with the expansion of the marketing channel. Channel I records the lowest price spread, as the produce is sold directly to consumers with minimal intermediary involvement. In contrast, Channel III shows the highest price spread due to the participation of both wholesalers and retailers, which adds additional marketing costs and margins. A wider price spread indicates that a substantial share of the consumer's payment is retained by intermediaries, thereby reducing the producer's share in the final price. This situation reflects inefficiencies in the existing marketing system and emphasizes the need to reduce unnecessary intermediary stages. Strengthening direct marketing initiatives and improving farmers' access to markets can help narrow the price spread and enhance farmers' income realization.

Producer's share

and the absence of intermediary margins, whereas Channel III is found to be the least efficient because of higher marketing costs and the accumulation of margins at multiple stages. The reduced efficiency observed in longer marketing channels underscores the need to strengthen marketing infrastructure and minimize avoidable intermediary involvement. Promoting direct marketing initiatives and strengthening cooperative or collective marketing systems can substantially improve marketing efficiency and enhance the overall functioning of the coconut value chain.

Constraints in coconut marketing

Table 10: Major constraints faced by coconut growers during marketing (n = 120)

S. No.	Constraints	Farmers	Percentage (%)	Rank
1.	Price fluctuation	108	90.00	I
2.	High transport cost	102	85.00	II
3.	Lack of storage	95	79.17	III
4.	Middlemen exploitation	88	73.33	IV
5.	Lack of market info	80	66.67	V
6.	High input cost	75	62.50	VI
7.	Lack of processing	70	58.33	VII
8.	Credit issues	65	54.17	VIII
9.	Poor infrastructure	60	50.00	IX
10.	Lack of grading	55	45.83	X

The study identified multiple constraints affecting coconut marketing, as presented in the table 10. Among the reported problems, price fluctuation emerged as the most critical constraint, expressed by 90.00% of the farmers and ranked first. Seasonal variations in production and uncertainty in market demand often lead to unstable prices, compelling farmers to dispose of their produce at comparatively lower rates. The second major constraint was high transportation

cost, reported by 85.00% of respondents, which significantly reduces net returns, particularly for farmers located far from major markets. The lack of storage facilities, reported by 79.17% of farmers and ranked third, forces immediate sale after harvest and restricts farmers from benefiting from favourable price conditions. Middlemen exploitation was identified as another major issue (73.33%), indicating weak bargaining power among farmers and increased dependence on intermediaries. Similarly, lack of market information (66.67%) limits farmers' ability to make timely marketing decisions and negotiate better prices. Other important constraints include high input costs (62.50%) and lack of processing facilities (58.33%), which reduce profitability and hinder value addition. Further, constraints such as credit-related difficulties (54.17%), poor infrastructure (50.00%), and the absence of grading and standardization (45.83%) reflect broader structural weaknesses in the marketing system. Overall, the findings highlight the need for strengthening marketing support mechanisms through improved storage and warehousing facilities, enhanced transport and market infrastructure, provision of timely market intelligence, and establishment of coconut processing units. In addition, promoting Farmer Producer Organizations (FPOs) and encouraging collective marketing can reduce dependency on intermediaries and improve farmers' income and marketing efficiency.

Conclusion

The present study on coconut marketing in Eluru District of Andhra Pradesh examined the existing marketing channels, marketing costs, price spread, producer's share, marketing efficiency, and major constraints faced by coconut growers. The findings revealed that most farmers were middle-aged, moderately educated, and belonged to small and marginal farm categories, indicating the economic importance of coconut cultivation for rural livelihoods. Three major marketing channels were identified, of which Channel II (Producer-Retailer-Consumer) was the most commonly used due to convenience. However, Channel I (direct marketing) was found to be the most profitable and efficient, with the lowest marketing cost and price spread, and the highest producer's share. Longer channels involving intermediaries resulted in higher costs and reduced farmer income. Major constraints included price fluctuations, high transportation costs, lack of storage facilities, and middlemen exploitation. The study concludes that promoting direct marketing, strengthening Farmer Producer Organizations (FPOs), improving infrastructure, and ensuring timely market information are essential to enhance marketing efficiency and improve farmers' income.

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Competing Interests

Authors have declared that no competing interests exist.

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