

Cost analysis on supply chain of Banana in Andhra Pradesh, India

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Abstract

Horticulture is an essential sector that plays a crucial role in the Indian agricultural economy. In India, among the fruit crops, banana takes the lead in production and holds the third position in terms of cultivated area. Andhra Pradesh accounted for 16.5% of the country's total banana in the year 2022-23 (TOI, 2023). Among the banana cultivating districts of Andhra Pradesh, Y.S.R. district has the highest area under the banana, followed by West Godavari and East Godavari districts. Numerous issues linked to the cultivation and sale of bananas in the state adversely impact both banana production and the financial gains from growing bananas. This study aims to analyze the forward linkages and assess the costs associated with the supply chain of banana in the study area. The primary data required for the study is collected from the sample respondents in the study area through a pre-tested comprehensive questionnaire. Descriptive statistics is used to analyze the data collected for the study. From the results, it could be seen that nearly 64.15 per cent of produce goes to the Pulivendula market, and the remaining produce, 35.85 per cent, goes to the Rajampeta market. From these two markets (Mandis), it reaches distant markets and finally reaches consumers through wholesalers and retailers. The overall inference drawn from the study is, although "Mandis" have been significant in banana marketing, they suffer from numerous drawbacks such as poor infrastructure and malpractices. Bananas sourced from the

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Y.S.R. district are renowned for their unique attributes, catering to various domestic and international markets. Despite this demand, farmers frequently find themselves receiving prices below the potential value of their produce. Institutional participation in banana marketing is nearly absent in the study area.

Key words : Supply Chain, Traders, Farmers, Costs, Descriptive statistics.

Understanding the supply chain in agriculture, including its determinants and limitations, becomes crucial when strategizing for economic development and the consequent agricultural transformation and modernization. Horticulture stands as an indispensable sector, wielding significant influence within India's agricultural economy framework. Among fruit crops, banana takes the lead in production and holds the third position in terms of cultivated area. It covers around 898 thousand hectares, with a yield of 31,747 thousand metric tons⁶. Over recent years, the six important banana producing states in India, Andhra Pradesh, Karnataka, Gujarat, Maharashtra, Tamil Nadu, and Uttar Pradesh, have adopted the cultivation of tissue-cultured bananas¹. Andhra Pradesh accounted for 16.5% of the country's total banana in the year 2022-23 (Times of India, 2023). Among the banana cultivating districts of Andhra Pradesh, Y.S.R. district has the highest area under the banana, followed by West Godavari and East Godavari, accounting for 16,371 ha, 13,725 ha and 13,292 ha respectively. Banana is a major fruit crop in Andhra Pradesh state, facing various constraints both in production and marketing. According to a trade source in Andhra Pradesh, during the months from March to May, the supply of bananas exceeds demand in the market, leading to a decline in prices.

Because of the excess supply, traders and farmers search for new markets for banana. Karnataka and Telangana are the nearest markets⁸. Several problems are associated with the cultivation and marketing of banana in the state. These problems affect the production of bananas as well as the profitability of banana cultivation⁵. In this situation, studying the supply chain of banana in Andhra Pradesh is a needed one to create a policy regarding the state's banana industry. The objectives of this study are to analyze the forward linkages and to assess the costs associated with the supply chain of banana in the study area. From Andhra Pradesh, Y.S.R. district was selected, and from the district, Lingala and Vemula Mandals were specifically selected as they rank first in terms of area and production as a sample area for this study.

The selection of Y.S.R. district among the 13 districts of Andhra Pradesh was deliberate due to its significant role as the top banana producer. The district has been witnessing consistent growth in banana cultivation, attributed to the region's high demand for this fruit¹. For the selection of Mandals in the Y.S.R. district, Lingala and Vemula Mandals were specifically chosen due to their prominent positions as they ranked 1st in terms of both area and banana production. A total of 16 villages were selected, and from those villages,

320 farmers were randomly identified as sample farmers using a probability proportionate method. This random selection was conducted using random number tables. Market intermediaries play a vital role in banana marketing. Market intermediaries such as commission agents, pre-harvest contractors, wholesalers and retailers who were involved in the marketing of banana were selected from the Pulivendula and Rajampeta markets with a total of 120 sample respondents. The primary data required for the study is collected from the sample respondents in the study area through a pre-tested comprehensive questionnaire. Descriptive statistics is used to analyze the data collected for the study.

i. Simple Tabular Analysis

The data were analyzed and interpreted in tabular form.

ii. Averages and Percentages

The analyzed data were expressed in averages and percentages for a better understanding.

Supply Chain of Banana in YSR District :

The supply chain of banana grown in YSR district is presented in Fig. 1. The banana produced in Y.S.R. district procured from the farmers by wholesalers and goes to Mandis of Pulivendula and Rajampeta market. The Fig. 1 clearly depicts that 64.15 per cent of the produce was traded in Pulivendula market and 35.87 per cent was traded in Rajampeta market. The main reason for the higher share of produce supply to Pulivendula market than Rajampeta market is shorter distance. Most of the banana producing villages are nearer to the Pulivendula market. From the Mandis of

Pulivendula market, the produce moves to Bangalore, Ghorakpur and Delhi market by the traders with the share of 44.24 per cent, 19.48 per cent and 36.28 per cent produce respectively. The banana grown in Pulivendula area, have a shelf life between 12-14 days under cold storage, which is higher than the normal cold storage (6-7 days) than other banana varieties make them most preferred for exporting other countries⁵. From Bangalore, 39.56 per cent of the produce is exported to the UAE, Saudi Arabia, Iran and Qatar. The remaining 60.44 per cent of bananas in city market is traded in and around Bangalore urban areas. In Ghorakpur arrival produce is traded in the local market. From these local markets it reaches to end consumers. Out of total quantity of banana arrived in Delhi market is dispatched to the Muzaffarnagar, Punjab and Haryana (28.34 per cent, 40.12 per cent and 31.54 per cent respectively).

From these, produce is traded in local markets and it reaches to end consumers. From the mandis of Rajampeta, the market of bananas moves to Anantapur, Hyderabad, Chittor and Chennai (29.46 per cent, 9.26 per cent and 11.70 per cent, respectively). From Hyderabad, 41.36 per cent of the produce is exported and the remaining 58.64 per cent is traded in the local market. In Anantapur, arrival produce is dispatched to Hubli and Dharwad markets with a share of 44.35 per cent, Haveri 31.49 per cent and Manvi 24.16 per cent. The banana dispatched to Chennai is 11.70 per cent. In chittor market arrived produce 9.26 per cent is purchased by Tirupati traders and from these local markets it reaches to end consumer. The similar pattern was observed by Prabhavathi *et al.*,⁷ in some other crop.

Cost involved at each stage in the Supply Chain of Banana :

Cost of Various activities incurred in the Supply Chain by Banana Growers :

The details of the cost of various activities in the supply chain of banana are presented in Table-1. The table indicated that

the major marketing cost incurred by the respondents were labour cost for loading and unloading and commission charges accounted for 34.04 and 17.02 per cent per quintal respectively. Other major costs in the supply chain are storage cost (25.53 per cent), transportation cost (10.63 per cent), weighing charges (5.10 per cent), sorting cost (2.58 per cent) and the other costs (5.10 per cent). The

Table-1. Cost of Various Activities Incurred in the Supply Chain
by the Banana Growers

(n=320)

Sl. No.	Particulars	Average cost Per Quintal (Rs.)	Percent to the Total
1	Sorting	6.00	2.58
2	Storage	60.00	25.53
3	Transportation charges (Pulivendula and Rajampeta markets)	25.00	10.63
4	Weighing charges	12.00	5.10
5	Commission charges	40.00	17.02
6	Labour (Loading and Unloading)	80.00	34.04
7	Others	12.00	5.10
	Total	235.00	100.00

Table 2. Cost of Various Activities Incurred in the Supply Chain
by the Banana Traders

(n=120)

Sl. No.	Particulars	Average cost Per Quintal (Rs.)	Percent to the Total
1	Sorting	14.00	2.55
2	Storage	100.00	18.29
3	Transportation charges (Pulivendula and Rajampeta markets)	300.00	54.85
4	Weighing charges	10.00	1.82
5	Commission charges	30.00	5.49
6	Labour (Loading and Unloading)	80.00	14.63
7	Others	13.00	2.37
	Total	547.00	100.00

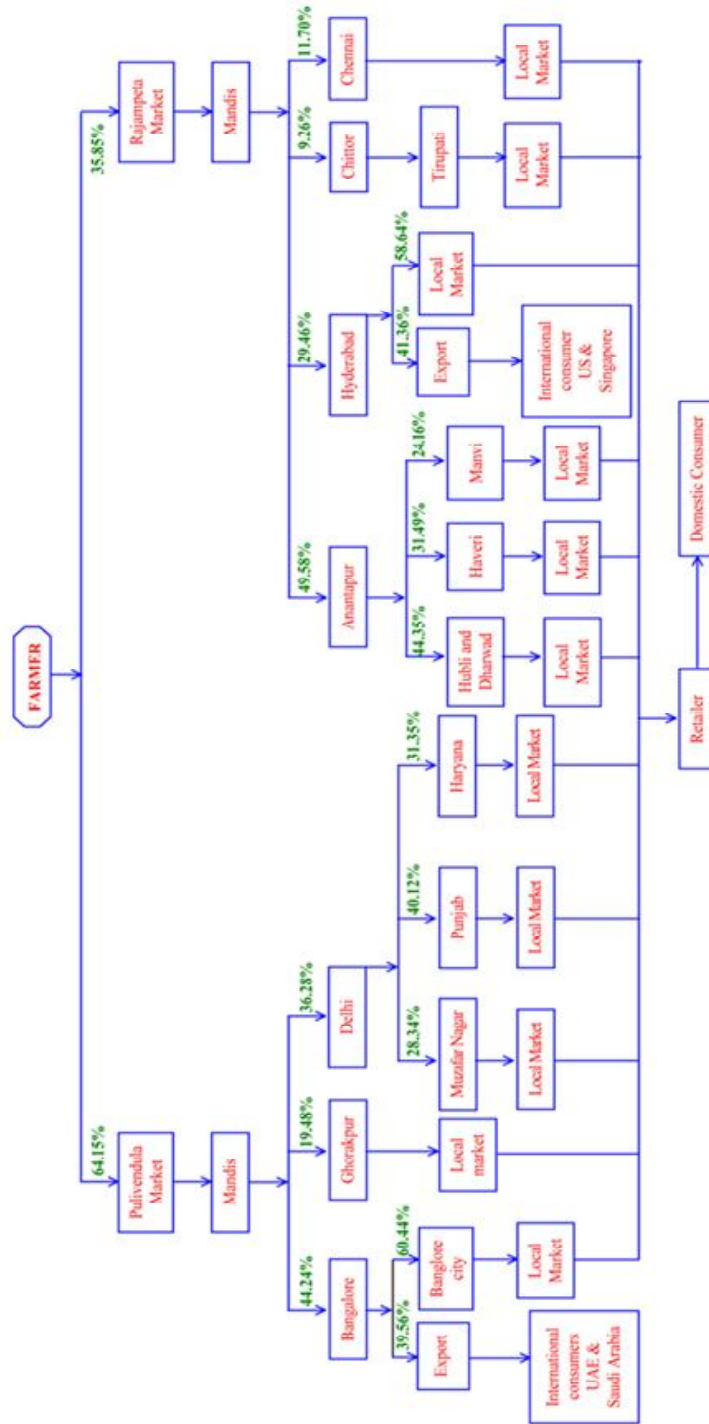


Fig. 1. Flow Chart of Supply Chain of Banana from YSR District

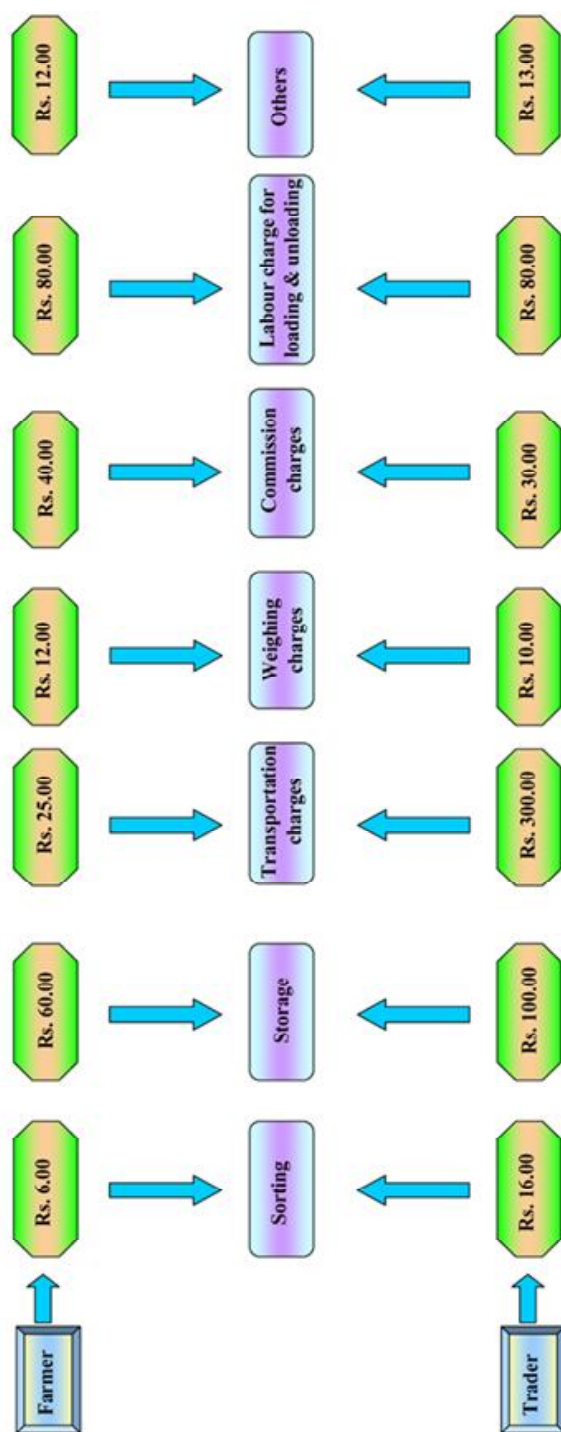


Fig. 2. Cost of Various Activities Incurred in the Supply Chain of Banana by the Farmers and the Traders

similar trend was also seen by Usharani and Ahuja¹⁷. The total average cost of all the activities incurred by the respondents in the supply chain of banana is Rs. 235.00 per quintal. The same pattern was also noted by Verma and Singh¹⁸.

Cost of various activities incurred in the Supply Chain by the Banana Traders :

The details of the average cost of various activities incurred in the supply chain by the banana traders are represented in Table 2. revealed that the major cost incurred by the traders is transportation cost (Rs. 300.00) which accounts 54.85 per cent of the total cost. The cost of storage and labour charges for loading and unloading is Rs. 100.00 and Rs. 80.00 respectively, and the share of these are 18.29 and 14.63 per cent of the total cost. The cost of weighing charges and sorting is Rs. 10.00 and Rs. 14.00 per quintal respectively, which accounts for 1.82 and 2.55 per cent of the total cost. Other miscellaneous costs accounts 2.37 per cent of the total cost. The total cost of various activities incurred in the supply chain of banana is Rs. 547 per quintal. The comparable findings were noted by Thombre & More¹⁶. The cost of various activities incurred in the supply chain is depicted in Fig. 2.

The forward linkage of the supply chain of banana in the study area was analyzed through the role players connected with it. Sorting, storage, transportation, weighing, handling and unloading and packing was the major activities and these activities were incurred major costs to the farmers as well as traders involved in the supply chain. From the

results, it could be seen that “Mandis” played a major role in banana marketing even though it has many defects like poor infrastructure and malpractices, etc. Banana from the Y.S.R district has a huge demand due to their uniqueness and reaches many different markets and overseas markets. But the price actually received by the farmer is lower than the potential price of their produce and the institutional role is almost nil for banana marketing in the study area.

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