Asian Journal of Agricultural Extension, Economics & Sociology

Volume 42, Issue 6, Page 82-89, 2024; Article no.AJAEES.117146
ISSN: 2320-7027

Growth and Marketing of Banana in Tamil Nadu

C. Velavan [a++*]

[a] *Department of Agricultural and Rural Management, Tamil Nadu Agricultural University, Coimbatore-641 003, Tamil Nadu, India.*

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: https://doi.org/10.9734/ajaees/2024/v42i62465

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/117146

Original Research Article

Received: 05/03/2024
Accepted: 08/05/2024
Published: 14/05/2024

ABSTRACT

Banana is an important fruit crop cultivated in India and Tamil Nadu ranks third in production in the country and the area under the banana is also increasing over the years in the state. However, high post-harvest losses were reported in banana due to improper development of marketing channels. Hence, this paper aimed to study marketing of banana and perform stakeholder analysis. Three districts namely Tiruchirappalli, Erode and Coimbatore were selected for the study based on the areaunder banana. The results of the study revealed that the growth rate of area was the highest in Vellore - Tiruvannamalai production centre with 7.75 per cent per annum and production and productivity growth were the highest in Cuddalore-Villupuram production centre with 8.39 and 7.23 per cent per annum respectively. Three banana marketing channels were identified in the study area. Pre- harvest contractor was the popular mode of sale by banana producers. The post-harvest loss of 8.5 to 14.5 kg/tonne was reported in selected banana cultivars. No packing method of banana was followed in the entire marketing channel and one third of market intermediaries did not have storage facility for banana. Hence, the marketing channels of the banana have to be improved on handling, storage and packing to reduce the losses.

[++] *Professor (ARM);*
**Corresponding author: E-mail: velavanc@tnau.ac.in;*

Cite as: *Velavan, C. (2024). Growth and Marketing of Banana in Tamil Nadu. Asian Journal of Agricultural Extension, Economics & Sociology, 42(6), 82–89. https://doi.org/10.9734/ajaees/2024/v42i62465*

Keywords: Banana; marketing channel; post-harvest losses; business practices; Tamil Nadu; post-harvest.

1. INTRODUCTION

Banana is an important horticultural crop cultivated among majority of the states in India. The area under banana has increased from 4.66 lakh hectares in 2001-02 to 9.41 lakh hectares in India during 2020-21. Similarly, production was also increased from 14.2 million tonnes to 33.1 million tonnes during the above period. Further, the productivity was increased from 30.5 tonnes per hectare to 35.8 tonnes per hectare during the same period [1]. Almost entire production is used as fresh in India and hence the entire production is subjected to post-harvest losses. Since bananas are transported as fresh and at different stages of ripening in the marketing channel, the post-harvest losses are high. The post-harvest losses were reported to be mostly passed either to consumer or producer of the marketing channel [2]. The losses are passed either as reduced price for producer/supplier or poor quality product to the consumer. The aggregate post-harvest losses of banana is estimated to be 35.26 lakh tonnes in India when compared to other major fruit crops. The value chain of banana was also found to be poor compared to the major fruit crops [3]. Improper packing practices were also reported in mango and banana [4]. Among the banana producing states, Tamil Nadu ranks third in area in the country with 97 thousand hectares and fourth in production with 3895 thousand tonnes [5-8]. However, high post harvest losses were reported in the banana marketing channels in the state. Hence, the present study aimed to trace the marketing channels in Tamil Nadu and perform stake holder analysis to identify the role of intermediaries.

2. MATERIALS AND METHODS

Tamil Nadu was purposively selected for the study, since it accounts nearly 15 per cent of the country's banana production. Three major traditional banana growing districts *viz*., Tiruchirappalli, Erode and Coimbatore were purposively selected for the study. From each selected district, top two taluks with the highest area under traditional banana were selected for the study. From each selected taluk, top two blocks with the highest area under banana were selected. From each block, 25 banana farmers were selected from the list of farmers collected from the banana growers association. Thus, the total sample farmers for the study accounted for 300. The wholesale markets in Tiruchirappalli, Erode and Coimbatore were selected to study the markets in marketing channel. Further, to conduct stakeholders' analysis, 30 wholesalers/traders, 15 processors and 60 retailers were selected proportionately from the each district for this study.

2.1 Growth Rate Analysis

For the present study, district-wise area, production and productivity of banana for the last 20 years in Tamil Nadu (2000-01 to 2019-2020) were collected from State Government publications [9]. The districts were grouped based on the banana production region for the better understanding of the results. Compound growth rates of these variables were estimated to measure the growth rate over the years. An exponential function of the following type was used to estimate the growth rate [10].

$$Y_{it} = A_i (1+r_i)^t \quad (1)$$

Where,

Y_{it} – Area/Production/Productivity of i th region at time t
r - Compound growth rate of Y_i
A_i - Initial year Area/Production/Productivity of i th region
t - Time in years
By taking natural logarithm of (1),

$$\ln Y_{it} = \ln A_i + t \ln (1+r_i) \quad (2)$$

Now letting

$$\alpha_i = \ln A_i$$

$$\beta_i = \ln(1+r_i)$$

Equation (2) can be written as

$$\ln Y_{it} = \alpha_i + \beta_i t \quad (3)$$

Adding the disturbance term to (3), it can be written as

$$ln\ Y_{it} = \alpha_i + \beta_i t + u_t$$

Y_{it} = Area/Production/Productivity by i th region at time t

t = time in years
α = constant term
β = regression co-efficient

This log linear function was fitted by using ordinary least square (OLS) method. The compound growth rate (r) was obtained using the formula.

$r_i = (\text{Antilog } \beta_i - 1) \text{ X } 100$

2.2 Stakeholder Analysis

Marketing channels present in the study area were identified based on discussions with the stakeholders. Further, stakeholders' analysis was performed based on the discussion meeting, Focus Group Discussion (FGD) and interviews with the all stakeholders in the marketing channel. Based on the analysis, stakeholders' functions, responsibilities and business activities were identified and mapped. Further, harvesting strategy, method of sale and postharvest activities were also identified and mapped.

3. RESULTS AND DISCUSSION

a. Growth Rate of Area, Production and Productivity of Banana

The growth rate of area, production and productivity was estimated for the major production centers of banana and the results are presented in Table 1. The results of the study revealed that the growth rate of area was the highest in Vellore - Thiruvannamalai centre with 7.75 per cent followed by Coimbatore – Erode center with 5.94 per cent. In contrast, the growth rate was reduced Pudukkottai-Thanjaur and Tiruchirappalli — Karur production centres with -1.92 per cent and -0.95 per cent respectively. Further, growth rate of production was the highest in Cuddalore-Villupuram production centre with 8.39 per cent followed by Vellore- Tiruvannamalaiwith 7.5 per cent. However, there was a reduction in production in Tirunelveli- Tuticorin and Pudukkottai – Thanjavur production centers with -0.96 per cent and -0.48 per cent respectively.

Similarly, the growth rate of productivity was the highest in Cuddalore-Villupuram with a growth rate of 7.23 per cent which contributed significantly to the production of the centre. The reduction in growth rate of productivity (-2.46 per cent) significantly contributed to the decline in production (-0.96 per cent) in Tirunelveli-Tuticorin production centre. Similarly, negative growth of productivity (-1.29 per cent) offset the production growth in Tirunelveli-Tuticorin production centre. Hence, it is concluded that Cuddalore-Villupuram production centre performed well in all the parameters followed by Madurai-Theni-Dindigul and Coimbatore-Erode production centers.

b. Banana Marketing Channel

Marketing channel accounts movement of any product from producer to consumer to satisfy their needs. Hence, marketing channels of banana were identified in the study area and the results are presented Fig. 1.

There were three marketing channels were identified in the study area. They are given below;

- Marketing Channel I: Farmers-Pre-harvest Contractors – Wholesalers- Retailers-Consumers
- Marketing Channel II: Farmers – Cooperative Marketing Society – Wholesaler – Retailer – Consumer
- Marketing Channel III: Farmers – Commission Agents – Wholesalers – Retailers- Consumers

c. Harvesting Strategy

Banana harvesting strategy is one of the important plan to meet the demand at various stages of the supply chain. It also helped to get better price for the produce. Hence, the harvesting strategy of the farmers was collected and the results are presented in Table 2.

From Table 2, it is found that about 32.67 per cent of farmers harvested the banana bunches during the change in colour from dark green to light green stage. Similarly, nearly 29 per cent of farmers harvested banana when the angular of fingers were dampened. Further, 25 per cent of farmers harvested three months after emergence of inflorescence. Same trend prevailed among the farmers of sample districts. Hence, it is concluded that farmers harvested banana based on a change of colour and dampening of the angular of fingers of banana.

d. Net Income of the producer

Net income is an important criterion for the selection of banana crop as well as cultivars within the crop. Hence, net return was worked out for main and ratoon crops and results are presented in Table 3.

Table 1. Growth rate of Banana area, Production and Productivity among major production centers (2007-2021)

S.No	Production Centers	Area	Production	Productivity
1.	Cuddalore -Villupuram	1.09	8.39	7.23
2.	Vellore –Tiruvannamalai	7.75	7.55	-0.18
3.	Coimbatore –Erode	5.94	6.50	0.53
4.	Tiruchirappalli-Karur	-0.95	1.52	2.49
5.	Pudukkottai-Thanjavur	-1.92	-0.48	1.47
6.	Madurai-Theni-Dindigul	3.95	6.90	2.84
7.	Tirunelveli-Tuticorin	1.54	-0.96	-2.46
8.	Kanyakumari	1.86	0.55	-1.29
9.	Others	3.90	4.37	0.45
	State	**2.62**	**3.27**	**0.63**

Table 2. Harvesting strategy of the farmers in the study area

S.No	Particulars	Poovan	Rasthali	Karpoora-valli	Sample
1.	Dark to light green change of fruit colour	48	38	12	98 (32.67)
2.	Dampening the angular of fingers	23	26	39	88 (29.33)
3.	After 3 months of Inflorescence emergence	11	22	42	75 (25.0)
4.	Falling of floral end	18	14	7	39 (13.0)
	Total	100	100	100	300(100.0)

(Figures in parentheses indicate percentage to the total)

Table 3. Gross Income and Net Returns from Main and Ratoon crops

S.No	Cultivar	Gross Income/ha	Expenditure /ha	Net Returns	B:C Ratio
1.	Poovan	1856250	904285	951965	2.05
2.	Rasthali	1518750	736161	782589	2.06
3.	Karpooravalli	1687500	800895	886605	2.10

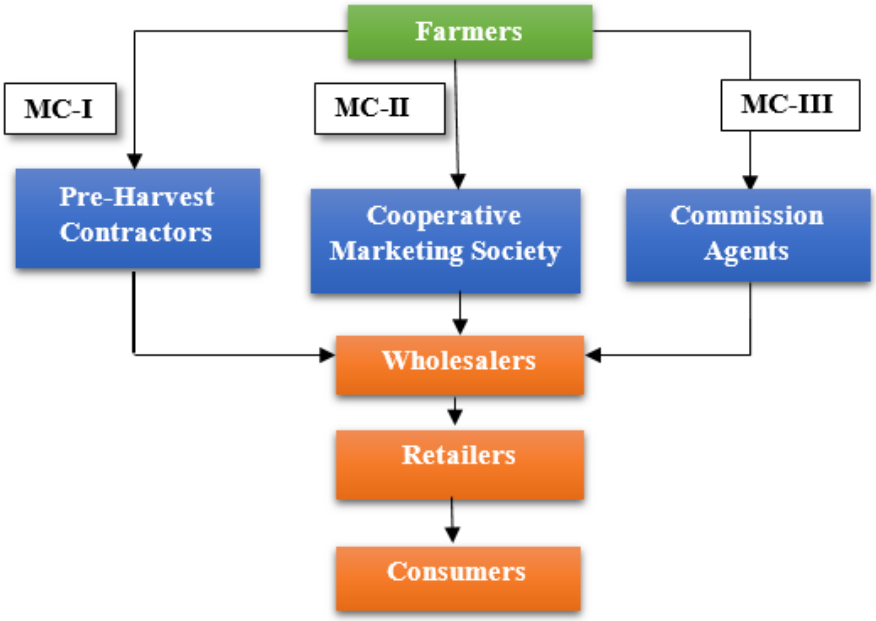

Fig. 1. Marketing channel of banana

Among the cultivars, Poovan fetched maximum income of Rs.18,56,250 per hectare from main and ratoon crops and incurred the expenditure of Rs.904285. The net return from poovan cultivar was Rs.951965 with B:C ratio of 2.05. Similarly, Gross income from the Rasthali Cultivar was Rs.15,18,750 and incurred an expenditure of Rs.7,36,161. The net return from Rasthali Cultivar was Rs.7,82,589 with a B:C ratio was 2.06. Further, the gross income from the Karpooravalli cultivar was Rs.16,87,500 and incurred an expenditure of Rs.8,00,895. The net return from Karpooravalli was Rs.8,86,605 with a B:C ratio was 2.10. Hence, it is concluded that the Karpooravalli is more profitable to the farmers followed by rasthali and poovan cultivars in the study area.

e. Post-Harvest Losses

High post-harvest losses are one of the major issue in the banana marketing channels. Post-harvest losses variy based on nature and stage of fruits. Hence, the details of post-harvest losses were calculated at different stages of marketing channels and results are presented in Table 4.

From the results, it is observed that the post-harvest losses were maximum in the Poovan cultivar followed by Rasthali and Karpooravalli. The post- harvest losses of poovan cultivar were accounted to 14.5 Kgs per tonne followed by Rasthali with 10.5 Kgs per tonne and Karpooravalli with 8.5 Kgs per tonne. Hence, it is concluded that the post-harvest losses of selected cultivars varied from 8.5 Kgs to 14.5 Kgs per tonne of banana.

f. Mode of Sale

Selection of the right channel for the sale of banana could increase the net value realization of the produce. Pre-harvest contract, commission and regulated markets were the popular mode of sale of banana. Hence, the details on mode of sale of banana was collected and results are presented in Table 5.

Table 4. Post-Harvest losses in Banana at different stages of marketing

S.No	Stage	Losses (Kgs/Tonne)	Percentage to the yield
I	**Field Level**		
1.	Poovan	2.0	2.0
2.	Rathali	1.5	1.5
3.	Karpooravalli	1.0	1.0
II	**Primary Market**		
1.	Poovan	3.5	3.5
2.	Rathali	2.5	2.5
3.	Karpooravalli	1.5	1.5
III	**Wholesale Market**		
1.	Poovan	3.0	3.0
2.	Rathali	2.0	2.0
3.	Karpooravalli	2.0	2.0
IV	**Retailer Market**		
1.	Poovan	6.0	6.0
2.	Rathali	4.5	4.5
3.	Karpooravalli	4.0	4.0
	Total Loss		
A.	Poovan	14.5	100
B	Rathali	10.5	100
C.	Karpooravalli	8.5	100

Table 5. Mode of sale by the farmers

S.No	Mode of sale	Tiruchirappalli	Erode	Coimbatore	Sample
1.	Pre Harvest Contractor	58 (58.0)	52 (52.0)	48 (48.0)	158 (52.67)
2.	Commission Agents	23 (23.0)	17 (17.0)	26 (26.0)	66 (22.0)
3.	Regulated Market	16 (16.0)	25 (25.0)	18 (18.0)	59 (19.67)
4.	Retailer	3 (3.0)	6 (6.0)	8 (8.0)	17 (5.66)
	Total	100 (100.0)	100 (100.0)	100 (100.0)	300 (100.0)

(Figures in parentheses indicate percentage to the total)

Table 6. Post-harvest activities of Market intermediaries

S.No	Particulars	Pre-harvest Contractors	Commission Agents	Wholesalers	Retailers
A	**Storage Facility**				
	1.Own	2 (16.67)	6 (50.0)	12 (80.0)	22 (73.33)
	2. Rented	9 (60.0)	4 (33.33)	3 (20.0)	8 (26.67)
	3. No Facility	4 (33.33)	2 (16.67)	-	-
B	**Treatment for ripening**				
	1.Yes	-	-	-	-
	2.No	15 (100)	12 (100)	15 (100)	30 (100)
C	**Sorting/Grading**				
	1.Yes	12 (80.0)	-	15 (100)	25 (83.33)
	2.No	3 (20.0)	12 (100)	-	5 (16.67)
D.	**Packing**				
	1.Yes	-	-	-	-
	2.No	15 (100)	12 (100)	15 (100)	30 (100)
	Total	**15 (100)**	**12 (100)**	**15 (100)**	**30 (100)**

(Figures in parentheses indicate percentage to the total)

Table 7. Business practices of marketing Intermediaries

S.No	Particulars	Pre-harvest Contractors	Commission Agents	Wholesalers	Retailers
A.	Credit to the sellers				
	1.Given	4 (26.67)	11 (91.67)	-	-
	2.Not given	11 (73.33)	1 (8.33)	15 (100)	30 (100)
B.	Credit to the Buyers				
	1.Given	12 (80.0)	10 (83.33)	14 (93.33)	28 (93.33)
	2.Not given	3 (20.0)	2 (16.67)	1 (6.67)	2 (6.67)
C.	Maintenance of Accounts				
	1.Given	15 (100)	12 (100)	13 (86.67)	-
	2.Not Given	-	-	2 (13.33)	30 (100)
D.	Price Discovery Mechanism				
	1.Open Auction	-	12 (100)	-	-
	2.Negotiation	15 (100)	-	15 (100)	5 (20)
	3. Prevailing Market Price	-	-	-	25 (80)

From the results, it could be inferred that sale to pre harvest contractor was the most popular mode of sale followed by farmers which accounted nearly 53 percent followed by Commission Agents (22 percent) and Regulated Market (19.67 per cent). Among the sample districts, almost similar trends were prevailed except Erode district where more farmers sold their produce through the Regulated Market (17 per cent) than Commission Agents (17 per cent). Hence, it is concluded that pre-harvest contract sale was the popular method in the study area.

g. Post-Harvest Activities

Post-harvest activities are an important function of supply chain agility and reducing the losses in a marketing channel. Hence, details of post-harvest activities were collected and results are presented in Table 6.

Among market intermediaries, 80 per cent of wholesalers, 73 per cent of retailers, 50 per cent of commission agents and 16.67 per cent of pre- harvest contractors had storage facility to store the banana during the trade. Further, about 60 per cent of pre-harvest contractors, 33.3 per cent of commission agents, 26 per cent of retailers and 20 per cent of the wholesalers used rental storage facility. However, no intermediaries performed treatment for the ripening of bananas. Further, all the sample wholesalers, nearly 83 per cent of the retailer and 80 per cent of pre- harvest contractors sorted the banana before selling it to others. However, no intermediaries used

packing materials for the storage and transport of banana.

h. Business Practices Market Intermediaries

Trading practices of market intermediaries are important function for the smooth flow of produce across the marketing channel. It gives clarity on role of each intermediariy in the trading practices. Hence, the details of the business practices of sample market intermediaries were collected and the results are presented in Table 7.

From the results, it is identified that nearly 91 per cent of commission agents and 26.67 per cent of pre-harvest contractors provided credit to the farmers. However, no wholesaler or retailer provided credit to the sellers. Similarly, 80 per cent of pre-harvest contractors, 83.33 per cent of commission agents, 93.33 per cent of wholesalers and retailers each provided credit to the buyers.

All the pre-harvest contractors and commission agents had maintained accounts of transactions. However, nearly 13 per cent of wholesalers and all the retailers did not maintain the accounts of transactions of banana trading. Except commission agents, no other intermediaries followed the proper mechanism for price discovery. However, 20 per cent of retailers, all pre-harvest contractors and wholesalers followed price negotiation with buyers for price discovery. Hence, it is concluded that proper price discovery mechanisms have to be evolved for banana at various levels of marketing channels.

i. Stakeholders Analysis

Pre-harvest Contractors:

- Inspects and fix the field for harvest by paying part of the value
- Harvest the farmers field by paying the balance amount
- They have updated banana wholesale price information and contacted with the wholesaler
- They used to take the product to major consumption centers like Chennai, Bangalore and Kerala markets

Commission Agents:

- Commission agents organize the markets twice a week
- Receives commission (10 %) for the value of transacted products from the farmers
- Lending money to the farmers for crop cultivation requirements with assurance of selling the harvest through him
- He also buys the product directly from the farmers and sends the product to the wholesalers of major markets.

Wholesaler cum Retailers:

- Retailer purchases the produce from auction of commission agent and sells the product to bulk consumers and retailers
- They settle the amount before the next purchase
- They also get finance from the commission agent when there is an emergency

Consumers:

- Consumers purchase the product from retailers and settle the amount immediately

4. CONCLUSION

From the results, it is concluded that the growth rate of area was the highest in Vellore - Tiruvannamalai centre with 7.75 per cent per annum, production and productivity growth rates were the highest in Cuddalore-Villupuram production centre with 8.39 and 7.23 per cent per annum respectively. There were three marketing channels present in the study area. Nearly 33 per cent of farmers harvested banana while change in colour from dark green to light green and 29 per cent of farmers harvested banana while change in the angular. The post-harvest losses was estimated to 14.5 kgs/tonne in Poovan, 10.5 kgs/tonne in Rasthali and 8.5 kgs/tonne in Karpooravalli. More than half of the farmers sold banana to pre-harvest contractor. Nearly 33 per cent of pre-harvest contactor and 16 per cent of wholesalers did not use the storage facility. Further, no market intermediaries packed the banana with any packing material. Hence, necessary efforts have to be taken in harvesting, packing and storage to reduce the losses and improve the banana marketing channels.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Banerjee, Economics of banana plantation under organic and in-organic farming systems. NABARD, working paper. 2010;223:1-8.
2. Davara PR, Patel NC. Assessment of post-harvest losses in banana grown in Gujarat. Journal of Horticultural Sciences. 2009;4(2):187-190.
3. Government of India, Horticultural Statistics at a Glance, department of agriculture and farmers welfare, ministry of agriculture and farmers welfare, New Delhi. 2023;13-14.
4. Government of Tamil Nadu, Season and crop report of Tamil Nadu, Directorate of Economics and Statistics, Chennai. 2000-2021;36-38.
5. Olumba CC, Onunka CN. Banana and plantain in West Africa: Production and marketing. African Journal of Food, Agriculture, Nutrition and Development. 2020;20(2):15474-89.
6. Gowri MU, Shanmugam TR. An economic analysis of production and marketing of banana in India. American International Journal of Research in Humanities, Arts and Social Sciences. 2015;9(3): 234-40.
7. Sora SA, Jibat Guji M. Evaluation of banana (Musa Spps.) for growth, yield, and disease reaction at Teppi, Southwestern Ethiopia. International Journal of Fruit Science. 2023 Dec 31;23(1):62-9.
8. Mankhin B, Khan MA, Begum ME, Hossain MI. Market attractiveness of pineapple and banana agroforestry systems of Madhupur Sal (Shorea robusta) forest: A sustainable way of generating income and conserving forests. Journal of Agriculture and Food Research. 2023 Mar 1;11:100475.
9. Gujarati, Damoder.N., Basic Econometrics, Mc Graw Book Company, New York, 1992; 169.
10. Murthy DS, Gajanana TM,Sudha M, Dakshinamoorthy V. Marketing losses and their impact on marketing margins: A case study of banana in Karnataka. Agricultural Economics Research Review**.** 2007;20(1): 47-60.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/117146