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A STUDY ON PRODUCTION OF BANANA: A CASE STUDY OF EAST GODAVARI DISTRICT OF ANDHRA PRADESH, INDIA

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Abstract:

Agriculture plays a significant role in the process of economic development of developing countries including India. It is the most competitive sector and is considered as the backbone of the Indian economy. In general, the importance of agriculture in the economic development of any country, rich or poor, is borne out by the fact that it is the primary sector of the economy, which provides the basic ingredients, necessary for the existence of human race and also provides most of the raw materials to many industries. The agricultural sector is a major component of our economic environment. As the key sector of the Indian economy, it has been used as an instrument of income and employment generation particularly in the rural areas. It plays a vital role in the economy of the country through its contribution to Gross Domestic Product (GDP), employment, foreign exchange earnings and so on. Agriculture is crucial for our national economy. Banana (*Musa paradisica. L*) is an important horticultural crop. Somewhere around Malaysia is believed to be the origin of Banana. Its cultivation happens in about 120 warm weather countries.

Key Words: National Horticulture Board (NHB),affordability,Potassium,fluctuations.

Objective of the Study

1. To analyse the trend, growth and magnitude of variability of Banana cultivation area, production, productivity in global, state and district level.
2. To analyse the cost and returns of Banana cultivation in East Godavari district.
3. To study the efficiency of resource use and returns to scale

2.Hypothesis

1. There is no significant difference between different mandals and different marketing channels.
2. There is no significant difference between Market efficiency in different marketing Channels.

3.Methodology

The study is based on both Primary and Secondary Data, the study has been chosen East Godavari district of Andhra Pradesh state. This district has been selected for more area of cultivation, production and productivity of banana. The Primary data was collected from 3 Mandals of East Godavari district i.e., Atreypuram, Prathipadu and Ravulapalem mandals. The Multi Stage Stratified Random Sampling method was adopted for collection of primary data. The primary data was collected from respondents/banana growers out of three mandals, from each mandal three villages were selected, from each village 50 farmers were selected total respondents consists of 450. Further, data was also covered from banana market middle men such as 50 Commission agent, 50 wholesalers and 50 retailers.

4.Imitations of the Study

The study is confined to three mandals viz., Atreypuram, Ravulapalem and Prathipadu, in East Godavari District of Andhra Pradesh. The study has been dependent on the information and primary data provided by the Banana growers/farmers, who have not maintained proper records about cost and returns i.e., cost of manures, irrigation, pesticides, suckers and the actual prices received for their produce.



5. Analysis of Data

For Collection of primary data, a pre-structured schedule was designed and analysed with the help of appropriate statistical tools in order to fulfil the objectives. The collected data were carefully classified and tabulated. For the present study the researcher used percentile analysis, Mean, Standard Deviation Compound Annual Growth rate, Co-efficient of variance, Instability Index, Cobb- Douglas production function, ANOVA Test, Composite index method, Garrett Ranking Technique, Marketing efficiency of Acharya & Agarwal method, Shepherd's method, and hypotheses analyses.

In this chapter is mainly focused on important Banana crops trade of banana cultivation area, production and productivity in Global, State and District level and also covered exports of Banana.

REVIEW OF LITERATURE

Carsten A. Brühl a, Maria Arias Andres b (2023)² the study reveals the Biodiversity is declining on a global scale. Especially tropical ecosystems, containing most of the planetary biodiversity, are at risk. Agricultural monocrop systems contribute to this decline as they replace original habitats and depend on extensive use of synthetic pesticides that impact ecosystems. In this review we use large-scale banana production for export purposes in Costa Rica as an example for pesticide impacts, as it is in production for over a century

Vivek Voora, Steffany Bermúdez, (2023)³ The study projected Global banana production continues to grow and meet increasing demand, though weather events, pests, and diseases affect supply. First domesticated in Southeast Asia, bananas have gone from being the first cultivated fruit to the most consumed and exported fruit in the world (ITC News, 2018; Reay, 2019; WorldAtlas, 2020).

Sushmita Bhatta et al. (2023)⁴ the study explained about Banana is a high-value commercial summer fruit growing in Nepal. The study was conducted to examine the profitability and resource use efficiency in banana production in the Chitwan district

6. Commercial benefits from Banana crop

World over people have been increasingly aware of the health and nutritive benefits of eating fresh fruits as meals, during meals and after meals. Edible bananas are commercially, classified as dessert types and culinary types. The Dessert Types are ripened fruits which are easy to digest, free from fat and cholesterol.

The Culinary Types have starchy fruits and are used in the mature unripe form as vegetables. Banana provides rich nutrition of potassium, vitamins, fibre, calcium, and iron. In fact, it contains natural sugars that instantly give energy. It has minerals (K, Mg, P, Ca, Na, Mn, Fe, Zn, Cu); Vitamins (B4, C, B2, B6, E, A). This apart it has carbohydrates and proteins in all providing energy of 90 calories.

Consumers' attention has shifted to hygienic and nutritious food items as food as health consciousness has been growing. Vitamin B6, Vitamin C, Manganese, Potassium, dietary fibers, and protein are all abundant in bananas.

7. Banana Production at the Global Level

Bananas are the most widely grown and one of the most widely traded fruits on the planet. In recent decades, the crop has seen rapid increase in production and trade volumes expanding global import demand, Bananas are the fourth (4th) most important food crop in terms of value, after wheat, rice, and maize. They are the world's most favourite fruit in terms of consumption volume. It is the highest traded fruit in the world, worth USD \$15 Billion, and 61 per cent share of global consumption, come from Asia-Pacific region. India is the world's largest banana producer, accounting for nearly



31.76 per cent of global production. Over 5 per cent of total global banana production is traded on the international market; the rest is consumed locally, mostly in large producing countries like India, China, Brazil, and some African countries where bananas play a significant role in people's diet.

Table.1.1
Country Wise Production of Banna

Year	India	China	Philippines	Indonesia	Brazil	Ecuador	Guatemala	Angola	Tanzania	Colombia
2012-13	26,509.10	12,075.20	8,646.42	6,279.29	6,892.62	5,995.53	3,307.04	3,095.01	2,678.68	3,769.65
2013-14	29,724.60	11,791.90	5,707.07	6,862.57	6,953.75	6,756.25	3,424.93	3,483.43	3,192.03	3,263.89
2014-15	29,221.40	10,627.00	5,840.12	9,496.06	6,859.23	7,194.43	3,796.11	3,595.31	3,584.53	3,705.34
2015-16	29,134.80	10,940.00	5,829.14	7,007.13	6,735.26	6,529.68	3,775.15	3,820.87	3,563.60	3,691.16
2016-17	29,162.60	11,170.00	6,041.37	7,162.69	6,675.10	6,282.10	3,887.44	4,301.88	3,484.79	3,786.67
2017-18	31,083.70	11,221.70	6,144.37	7,264.38	6,752.17	6,505.64	4,026.55	3,492.18	3,469.09	3,707.15
2018-19	31,046.50	12,691.69	6,560.93	7,967.00	7,441.77	7,125.90	4,915.10	4,448.07	3,822.22	3,295.99
2019-20	32,004.40	11,655.70	6,049.60	7,280.66	6,812.71	6,583.48	4,341.56	4,036.96	3,406.94	2,914.42
2020-21	32,124.40	12,561.96	6,460.36	8,858.32	7,238.19	6,559.01	5,048.75	4,533.76	3,848.56	2,779.24
2021-22	32,453.11	13,324.34	5,829.14	7,007.13	6,764.32	6,529.68	3,775.15	3,858.07	3,559.64	2,043.67
Rank	1	2	3	4	5	6	7	8	9	10
CAGR	2.04%	0.99%	-3.87%	1.10%	-0.19%	0.86%	1.33%	2.23%	2.88%	-5.94%
CV	6.09	7.28	13.73	13.03	3.53	5.39	14.36	12.07	9.65	17.34

Source: National horticulture board/ <https://nhb.gov.in>

The table 1.1 shows that India is the largest Banana Producer. India, China, Philippines, Indonesia, Brazil, Ecuador, Angola, Tanzania, Colombia are the highest producing Countries. These are the top ten Banana producing countries in the world. The Percentage share of India is 31.76 and the percentage share of China is 12.07 percent. These two countries contribution is nearly 40-42 per cent of World Production. During the year 2012-13 to 2021-22 the Production of India has increased from 26,509.10 to 32,453.11 Mt Angola, Tanzania and Colombia countries contribution is minor among the top 10 countries.

Tanzania had increased at the rate of 2.88 per cent per annum followed by Angola 2.23 per cent per annum, followed by India 2.04 per cent. The Production of Banana had decreased at the Compound Annual Growth Rate of Brazil, Philippines, and Colombia 0.19 per cent 3.87 per cent, 5.94 per cent. The Production of Banana Colombia experienced a variation of 17.34 per cent followed by a variation of Guatemala had experienced a variation of 14.36 per cent followed by Philippines a variation of 13.73 per cent followed by India a variation of

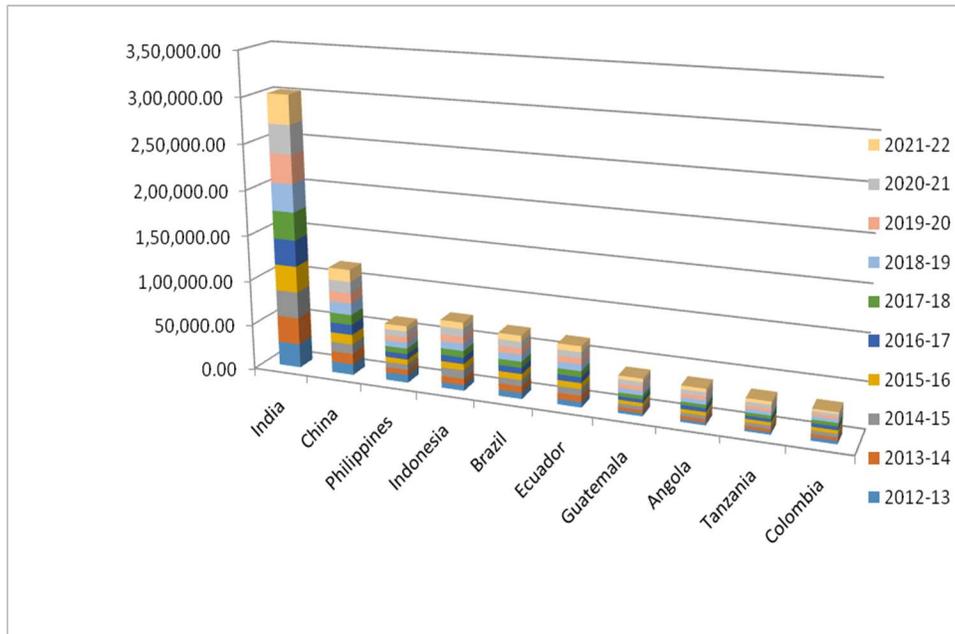
13.03 per cent followed by Angola a variation of 12.07 per cent followed by Tanzania

9.65 per cent, In China 7.28 per cent, In India 6.09 per cent, In Ecuador 5.39 per cent, In Brazil 3.53 per cent. Colombia had experienced highest of 17.34 per cent in the world and Brazil had experienced lowest variation of 3.53 per cent.



Figure 1

Country wise Production of Banana



8.Indian Banana Market

India is a rural economy with one third (1/3rd) its population depending on agricultural sector directly and indirectly. There are many horticulture crops, which are main stay for farmers in India. According to FAO 2020 report banana has increased significantly as global food supply in recent decades.world over, 32,453.11 metric ton from an area of 8,99,220 hectares were produced in India, making us the world's leading producer of bananas, accounting for nearly 31% of the total production.

Table 1.2

Banana Production in India since 2012-13

Banana Cultivation in India			
Year	Area (000 hectors)	Production (mt tonnes)	Productivity in Kgs Per Ha
2012-13	776	26,509	34,161
2013-14	803	29,725	37,037
2014-15	822	29,221	35,549
2015-16	841	29,135	34,635



2016-17	858	29,163	35,544
2017-18	859	31,084	37,037
2018-19	866	31,047	35,592
2019-20	877	32,004	35,644
2020-21	892	32,124	35,678
2021-22	899	32,453	36,001
CAGR	1.22%	1.32%	0.08%
CV	4.81	6.08	2.66

Source: National Horticulture board Annual Report

In India banana ranks first in production and third in area among fruit crops. It accounts for 13 per cent of the total area and 33 per cent of the production of fruits. The table 3.2 reveals area in 000 hectares and production in metric tonners for last 10 years. From 2012-13 to 2021-22 the area under cultivation increased almost 1,23,000 hectares. And production also increased 26,509 thousand tonnes to 32,453 thousand tons, it's almost 30percent increase in Production. Compound annual growth rate recoded 1.22 percent in area and 1.32 percent in Production and 0.08 per cent in productivity

Table 1.3
Banana Production in India since 2012-2013

Year	Production (000 tonnes)	Production Increase/ Decrease (000ton)	% of Increase / Decrease
2012-13	26.50	-	-
2013-14	29.72	3.22	10.81
2014-15	29.22	-0.50	-1.71
2015-16	29.13	-0.09	-0.30
2016-17	29.16	0.03	0.10
2017-18	31.08	1.92	6.17
2018-19	31.04	-0.04	-0.13
2019-20	32.00	0.95	2.98



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2020-21	32.12	0.12	0.37
2021-22	32.45	0.33	1.02

Source: National horticulture board

The table 1.3 indicates the banana production increase and decrease in Indian production for the past 10 years. Banana production it was recorded during year 2012- 13 26.50 thousand metric tonnes and the next year increased up to 3.22 thousand tonnes which is highest percentage in production over 10 years recorded 10.81 per cent, continuous years the production in increase fluctuated -0.05 percent to 1.92 percent. During the years 2017-18 banana production in increase recoded 1,092 tons and percentage in increase 6.17, the growth of production gradually increasing since 2019-20

Banana State wise Production in India

Tamilnadu was top in the production of bananas above 4,000 metric tons from 2011 to 2015; thereafter, Andhra Pradesh. continued to perform as first in the production of bananas until the present. Since 2015 state of Maharashtra and state of Gujarat, State of Tamilnadu have been taking the number one position in turn. But in the 2016-17 the first-time state of Andhra Pradesh had a share of 15.36 per cent Banana production, compared to the state of India with the highest production In last 6 years the state of Andhra Pradesh has successfully maintained in average of production of banana over 5000 metric tonnes. Out of these 6 years the peak level of production, i.e., 17.99 per cent of Indian banana production.

Table 1.4

State wise Banana Production (Production in Metric tonnes) since 2012-13

	Andhra Pradesh	Maharashtra	Gujarat	Tamil Nadu	Karnataka	Uttar Pradesh	Maharashtra	Bihar	West Bengal	Assam	Kerala	Chattisgarh	Orissa
2012-13	2,899.63	4,315.00	4,047.77	6,736.43	2,351.50	1,346.05	1,379.17	1,580.48	1,053.99	745.27	419.49	381.66	506.24
2013-14	3,242.80	3,600.00	4,523.49	5,136.20	2,529.60	1,590.02	1,701.00	1,702.41	1,077.80	837.02	515.61	413.4	521.31
2014-15	3,166.90	4,830.60	4,225.49	5,650.00	2,675.63	1,599.02	1,735.00	1,435.78	1,097.50	857.72	528.21	498.81	476.6
2015-16	3,487.31	4,030.58	4,324.36	4,147.18	2,593.33	1,990.58	1,836.00	1,535.00	1,124.00	865.67	1,270.57	564.43	469.25
2016-17	3,570.62	3,025.15	4,185.52	4,331.65	2,370.95	3,061.21	1,758.05	1,535.30	1,172.34	882.71	1,292.41	587.42	462.71
2017-18	4,672.75	3,888.90	4,293.23	3,499.48	2,446.03	3,160.82	1,876.45	1,527.85	1,172.34	854.85	1,250.55	609.21	466.44
2018-19	5,003.07	4,209.27	4,472.32	3,205.04	2,328.90	3,172.33	1,834.03	1,396.39	1,200.00	913.27	1,119.16	745.78	449.82
2019-20	5,601.31	3,562.40	4,610.61	3,153.55	2,146.72	3,222.57	1,853.03	1,591.58	1,223.25	917.79	807.15	615.03	408.69



20	5,86	4,153.	4,6	3,9	2,61	3,3	1,8	1,3	1,1	90	95	602.7	48
20-21	1.70	65	27.52	86.73	3.81	32.14	47.64	70.55	32.64	6.68	5.33	2	3.17
2021-22	5,834.70	4,223.05	3,907.21	3,895.64	3,367.67	3,387.51	2,025.46	1,612.56	1,116.40	909.83	957.05	585.71	502.83
CAGR	7.24	0.22	-0.35	-5.33	3.66	9.67	3.92	0.20	0.58	2.02	8.6	4.38	-0.69
CV	27.37	12.46	5.54	26.22	13.01	32.51	9.43	6.72	4.77	5.98	36.43	18.83	6.75

Source: National horticulture board/ <https://nhb.gov.in>

The above table 1.4 reveals that Andhra Pradesh, Maharashtra, Gujarat, Tamilnadu, Karnataka are the major Banana Producing states. The share of top 5 states in the total Production is around 60%.

Uttar Pradesh, Madhya Pradesh, Bihar, west Bengal, Assam states Contribution in the Total Production is between 20-25%, Kerala and Chhattisgarh are the minor Banana Producing states. From 2014-15 onwards Kerala State Production also increased. The annual compound growth rates of area under Banana cultivation state wise in India from 2012-13 to 2021-22 and their Coefficient Variation are presented.

Table 1.5

Production of Banana in Andhra Pradesh since 2012-2013

Year	Production in 000Mt	production increase / Decrease	% of Increase / Decrease
2012-13	2,899.63	-	-
2013-14	3,242.80	0.35	10.80
2014-15	3,166.90	-0.08	-0.25
2015-16	3,487.31	-0.32	9.19
2016-17	3,570.62	0.09	2.52
2017-18	4,672.75	1.10	23.55
2018-19	5,003.07	0.33	0.06
2019-20	5,601.31	0.60	10.71
2020-21	5,861.70	0.26	4.43
2021-22	5,834.70	-0.03	-0.51

Source: National horticulture board/ <https://nhb.gov.in>



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The table 1.5 reveals that the production of banana in India ranged from 2899.63 MT in 2012-13 to a maximum of 5834.70 MT, in 2021-22. The production increased by 2935 MT from the past 10 years. The production of banana in Andhra Pradesh is increased gradually and there are small fluctuations in the production. The percentage of increase in production is high in the year 2017-18 i.e., 23.55. The percentage of increase is negative and least in the year 2014-15 i.e., -0.25 per cent.

Table-1.6
District wise Production (in metric tonnes) since 2011-12

Year	Srikakulam	Vizianagaram	Visakhapatnam	East Godavari	West Godavari	Krishna	Guntur	Prakasam	Nellore	Chittoor	Kadapa	Ananthapur	Kurnool
2011-12	54,319	1,33,645	22,833	3,02,514	3,48,290	35,937	2,16,308	11,455	18,284	55,948	5,18,880	5,05,176	18,621
2012-13	63,744	1,72,538	29,273	2,39,345	3,13,757	40,635	2,00,671	12,932	33,896	54,126	4,83,345	4,55,433	41,109
2013-14	47,549	77,367	27,661	1,53,871	2,05,367	45,738	2,11,734	9,561	25,764	50,203	4,97,926	4,83,881	51,539
2014-15	64,850	2,49,184	65,461	5,96,889	3,78,600	48,450	2,33,310	28,000	27,000	42,734	9,53,280	5,85,600	2,13,950
2015-16	80,360	2,61,664	52,000	5,89,720	3,78,600	75,150	1,91,520	34,400	34,550	64,800	8,32,000	7,84,704	1,91,150
2016-17	1,52,110	5,87,346	97,520	7,09,140	7,29,227	1,96,736	2,79,787	21,253	79,500	1,06,000	8,67,663	6,53,543	1,92,920
2017-18	1,88,220	2,35,920	1,10,400	9,33,319	9,50,160	2,89,920	2,88,300	24,060	92,700	1,36,380	15,72,199	9,19,548	2,20,200
2018-19	1,88,220	6,62,880	1,10,400	9,58,380	7,95,300	3,36,780	3,05,700	21,000	96,720	1,43,040	14,21,100	9,39,960	2,44,200
2019-20	1,89,120	3,48,000	82,980	9,46,140	7,87,500	2,86,260	2,99,760	22,800	57,720	1,43,040	15,53,220	9,06,960	2,38,200
2020-21	1,89,840	2,72,940	1,07,820	10,46,700	3,14,760	2,55,360	2,43,360	28,200	1,53,360	1,94,820	25,51,968	7,52,880	3,72,960
CAGR	13.33	7.39	16.79	13.22	-1.01	21.66	1.19	9.43	23.7	13.29	17.27	4.07	34.94
CV	52.84%	62.72%	50.91%	50.59%	50.84%	76.54%	17.40%	37.53%	69.77%	53.27%	58.21%	26.91%	61.83%

Source: Department of Horticulture, Andhra Pradesh/ <https://horticulture.ap.nic.in/>

The Production of Banana in the Kurnool district had increased at the Compound Annual Growth Rate of 34.94 percent per annum followed by 23.7 per cent per annum in Nellore district about 21.66 per cent per annum in Krishna district followed by Kadapa, Visakhapatnam, Srikakulam Chittoor, East Godavari, Prakasam, Vizianagaram, Ananthapuram and Guntur, West Godavari recorded the nagtive CAGR with -1.01 percent per annum



shows that the Production of Banana in East Godavari district of Andhra Pradesh ranged from a minimum of 202514 metric tons in 2011-12 to a maximum of 1046700 metric tons nuts in 2020-21. The production noted fluctuation during 2012-13 and 2013-14 years. -26.39 per cent and -55.55 percent in both the years. The production increased 74.22 percent during the year 2014-15.

9. District wise productivity of Banana

Among the major districts of Andhra Pradesh, productivity of Banana YSR Kadapa district occupied ranks first, with 59.52 MT per hectare followed by Ananthapur with 58.95 Mt flowed by Kurnool and Guntur districts. The productivity of Banana nut in Andhra Pradesh since 2011-12 is given in table.

Findings

1. It is found from the data India, China, Philippines, Indonesia, Brazil, Ecuador, Angola, Tanzania, Colombia, are the highest producing Countries. These are the top 10 Banana producing countries in the world. The Percentage Share of India is 31.76 and the percentage share of China is 12.07 percent.
2. 2017-18 banana productivity recorded in increase 4.19 per cent and per hector production increased 1.49 tone per hector. Gradual increase in productivity observed from 2019-2022.
3. It is evident from the data during the year 2016-17 for the first-time state of Andhra Pradesh share is 15.36 percent in banana production. Between the states of India with highest production. Since then State of Andhra Pradesh has been maintaining the first position in Banana production in India. Comparison with all other states. In last 6 years the state of Andhra Pradesh has successfully maintained average production of banana over 5000 metric tonnes
4. It is observed that the Production of Banana in the Uttar Pradesh increased at the rate of 9.67 per cent per annum followed by 8.6 per cent per annum in Kerala, 7.24 per cent per annum in Andhra Pradesh, 4.38 per cent per annum
5. The production of Banana in Kerala had experienced the highest variation of 36.43 per cent followed by Uttar Pradesh 32.51 Per cent. West Bengal experiencing the lowest variation of 4.77 per cent.

Suggestions

1. The Department of Horticulture can set up soil research stations and also can conduct seminars to provide information about soil conservation, permanent good yield, significance of natural manures, methods of cultivation, etc. so as to help the farmer's access technological research and development at the ground level.
2. Effective market intelligence and market promotional activities should be undertaken by the government organisations.
3. When the Minimum Support Price for Banana is announced, the Government of India should advise the National Agricultural Co-operative Marketing Federation (NAFED).
4. The Government should setup a separate Storage facility in each mandal headquarters to stock Banana and ensure direct link between the banana farmers and consumers, thus eliminating the intermediaries.
5. The Central and State Governments should provide fertilizers, pesticides which is suitable to crop at reasonable prices with proper guidelines.
6. The Crop Insurance should be given for the crops in order to get compensation for the loss due to pest and diseases/natural disasters.

Conclusion

In Andhra Pradesh, East Godavari district still plays a vital role in Banana production, but is slowly losing its position because of un-remunerative price for the produce. In this situation, the policy makers and other stakeholders are urging to take necessary steps to boost up Banana cultivation practices in the study area. As the consumer price for a banana farmer is getting very low, it clearly shows that the marketing system is not favourable to the farmers. If the government takes necessary steps to regulate banana marketing process and gives, financial assistance to make value added products



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from core products it may encourage the banana production. Central and State Governments should take up policy decisions and formulate suitable schemes and programmes to ameliorate socio-economic conditions of the banana growers/farmers. The present study has focused on various issues relating to production and marketing of banana. The policy implications suggested, if properly implemented, may result in increased revenue for the nation and the banana farmers concerned.