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AN ECONOMIC ANALYSIS OF TREND, COST AND RETURNS OF BANANA IN KANNIYAKUMARI DISTRICT OF TAMIL NADU

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Abstract

Banana (*Musa* sp.) is the second most important fruit crop in India next to mango. It comes under the family of Musaceae and originated in Indo- Malayan region (South East Asia). Banana is called as the *"fruit of the wise men"*. In recent years, considering the adverse impact of indiscriminate use of chemicals, new trend for organic production of banana is increasing in this country. World's total banana production during 2020-21 was 116,781,658 (000MT). India is one of the leading producers of banana production in our country. India ranks first in producing the largest number of bananas with 32,454 (000 MT) and it's accounted for 26.75 per cent of total banana production in the world. Tamil Nadu ranks fourth banana production estimated for 3,895.64 (000 MT) and accounting for 10.41 per cent in the total production in this country. The specific objectives were to analyze the trends in area, production and productivity of banana and cost and returns of Banana farms. The compound growth rate for banana area, production, productivity was -0.99, -9.51 and -7.68 respectively. It is observed that the compound growth rate is negative for area, production and productivity. This may occurred due to some climatic fluctuations and environmental changes. The trend line for productivity showed a positive trend (0.18) which may be due to improved technologies adopted by the farmers. The total cost of cultivation of banana per acre was Rs. 1, 34,615. The Gross Income is Rs. 2, 34,000. The Net Income is Rs.99, 385 The BCR value is 1.73. Thus it concluded that banana is economically profitable for the farmers.

Key Words: Banana Cultivation, BCR, Cost and Returns, Growth Rate, Trend Analysis.

Introduction

Banana (*Musa* sp.) is the second most important fruit crop in India next to mango. It comes under the family of Musaceae and originated in Indo- Malayan region (South East Asia). Banana is also known as Antique fruit crop, Tree of wisdom, Tree of paradise, Adams fig, Plant of virtue and Apple of paradise. Banana is called as the *"fruit of the wise men"*. In recent years, considering the adverse impact of indiscriminate use of chemicals, new trend for organic production of banana is increasing in this country. Banana is a perennial herb with pseudo stem grown up to 5 meters height. Banana is a very popular fruit due to its high nutritive value and low price. It is consumed either in fresh or cooked form both as ripe and raw fruit. Banana is a rich source of carbohydrate and vitamins particularly vitamin B. Banana fruit is easy to digest, free from fat and cholesterol. Processed products of banana, such as chips, banana puree, jam, jelly,

juice, wine and halva can be made from the fruit. Banana fiber is used to make items like bags, pots and wall hangers. Rope and good quality paper can be prepared from banana waste. Banana leaves are used as healthy and hygienic eating biological plates. Banana is a perennial crop that grows quickly and can be harvested around the year.

Banana is a perennial crop that grows quickly and can be harvested around the year. World's total banana production during 2020-21 was 116,781,658 (000MT). India ranks first in producing the largest number of bananas with 32454 (000 MT) and it's accounted for 26.75 per cent of total banana production in the world followed by China with 11,170 (000 MT) and accounting for 9.81 per cent. In India, Andhra Pradesh stands in the first rank of banana production were estimated for 5,003.07 (000 MT) and it's accounted for 16.23 per cent in the total production in this country, followed by Gujarat, Maharashtra stands second and third in banana production. Tamil Nadu ranks fourth banana production estimated for 3895.64 (000 MT) and accounting for 10.41per cent in the total production in this country.

In Tamil Nadu, Coimbatore ranks first in banana production estimated for 365.02 (000 MT) and accounting for 10.43 per cent in the total production in this state. This is followed by Tuticorin with production of 340.24 (000 MT) and accounting for 9.72 per cent in the total production in this state, Tiruvannamalai stands in the third position with 257.03 (000 MT) and accounting for 7.34 per cent in the total production in this state, Tiruchirappalli stands in the fourth position with 249.92 MT and accounting for 7.14 per cent in the total production in this state, Kanniyakumari stand in the fifth position with 215.33 (000 MT) and accounting for 6.16 per cent in the total production in this state.

Objectives

1. To study the trends in area, production and productivity of banana.
2. To study the cost and returns of Banana farms.

Methodology

Study Area

Nendran banana is highly cultivated in Kanniyakumari District. It is used mainly in chips preparation. Hence, Kanniyakumari district was purposively selected for the study. The District consists of 9 blocks namely Thackalai, Thovalai, Kurunthencode, Munchirai, Killiyoor, Thiruvattar, Melpuram, Agastheeswaram, Rajakkamangalam. After arranging the blocks in the descending order based on area under Banana, Thackalai block was selected in Kanniyakumari district. Thackalai block as second stage unit, villages at third stage and farm households cultivating Banana as the ultimate sampling units. Thackalai block consists of 21 villages. After arranging the villages in the descending order of magnitude based on the area under Banana, the first five villages namely Kalkulam, Chadayamangalam, Muthalakurichi, Thickanamcode, Athivillai, were selected. From these villages, 60 numbers of farmers were selected randomly.

Tools of Analysis

Growth Rate Analysis

To study the growth rate in Area, Production and Productivity of banana in Kanniyakumari District, the compound growth rate was computed using the exponential growth model.

$y=a\ b^{t}$

log y=log a+ t log b

y=A + B t

Where,

Y=log y

A=log a

B=log b

Y = Area (ha)/ production (tonnes) and productivity (tonnes/ha)

t= Time elements which takes the value 1, 2. . .n for various years

A = Intercept

B = Regression coefficient

Compound Growth Rate 'r'= (Antilog of B-l) X 100.

Student "t" test was used to test the significance of the calculated compound growth rate.

t=T/SE(r)

Where,

I = Compound growth rate

SE = Standard Error.

Cost Concept

The Directorate of Economics and Statistics, Government of India estimated different costs as Cost A_1, Cost A_2, Cost B and Cost C.

Cost A_1: It consists of all actual expenses in cash and kind incurred in production by the owner operator. It includes cost of hired human labour, cost of manures and fertilizers, cost of plant protection chemicals, irrigation cost, interest on working capital, land revenue and depreciation of fixed capital.

Cost A_2: Cost A1 plus rent paid for leased in land.

Cost B: Cost A; plus imputed rental value of owned land.

Cost C: Cost B plus imputed value of family labour.

Returns

Gross Returns: Gross return was obtained by arriving at the total value of banana, valued at harvest price in the reference period.

Gross returns = value of main product+ value of by product

Net Returns: The Net returns were computed by subtracting the total cost from the gross income.

Net Returns = Gross returns- Cost of Cultivation

Cost of Production per Unit

Cost of production per tonne of banana was arrived at by dividing the net cost of cultivation per acre by the total per acre yield of banana in tonne.

$$Cost\ of\ production = \frac{cost\ of\ cultivation/acre - value\ of\ by\ product}{yield/acre}$$

Benefit Cost Ratio

Benefit cost ratio was obtained by dividing the gross income by the total cost of production per acre.

$$Benifit\ Cost\ Ratio = \frac{Grossreturns}{cost\ of\ cultivation}$$

Result and Discussion

1) Growth Rate Analysis

The area, production and productivity of Banana in the study area for 10 years (2012-2021) were collected and analyzed using growth rate and trend analysis.

Table 1. Descriptive Statistics of Area, Production, Productivity

S. No	Summary Statistics	Area ('000 Ha)	Production ('000 T)	Productivity (Tonne/Ha)
1.	MEAN	6,005.653	1,43,103.6	23.8288
2.	SD	798.7424	42,269.89	6.788
3.	KURTOSIS	2.241172	-0.77978	0.359472
4.	SKEWNESS	-1.4857	0.02731	1.021509
5.	RANGE	2,526.195	1,26,538.9	19.21
6.	MAXIMUM	6,771	2,03,285	37.29
7.	MINIMUM	4,244.805	76,746.07	18.08

It could be observed from the table 1 that the estimated average area, production and productivity of Banana were 6,005.653 Ha, 1, 43,103.6 Tonne and 23.8288 Tonne/Ha respectively. The range between the values of area was 4,244.805 to 6,771, In case of production, the ranges between 76,746.07 to 2, 03,285 and productivity ranges between 18.08 to 37.29.

Table 2. Growth Rate of Area, Production and Productivity of Banana in Kanniyakumari District (2012- 2021)

S. No	Year	Area ('000 Ha)	Production ('000 T)	Productivity (Tonne/Ha)
1.	2012-2013	5,451	2,03,285	37.29
2.	2013-14	5,982	1,63,009.5	27.25
3.	2014-15	6,396	1,45,381.1	22.73
4.	2015-16	6,542	1,98,157.2	30.29
5.	2016-17	6,382.72	1,56,887.2	24.58
6.	2017-18	6,636	1,19,978.9	18.08
7.	2018-19	6,771	1,22,419.7	18.08
8.	2019-20	5,645.35	1,02,067.9	18.08
9.	2020-21	4,244.805	76,746.07	18.08
	AVERAGE	6,005.653	2,03,285	37.29
	CGR(per cent)	-0.99502	-9.51626	-7.68837

It could be inferred from the table 2 that the compound growth rate for banana area, production, productivity was -0.99, -9.51 and -7.68 respectively. It is observed that the compound growth rate is negative for area, production and productivity. This may occurred due to some climatic fluctuations and environmental changes.

Trends in Area, Production and Productivity

The trend line in area, production and productivity are presented in figure- 1, 2 and 3 respectively. The exponential trend line witnessed that there is a declined trend in the area and production of banana in Kanniyakumari District during 2012-13 to 2020-21. The trend line for productivity showed a positive trend (0.18) which may be due to improved technologies adopted by the farmers.

Figure 1. Trend line of Area and Growth of Banana in Kanniyakumari District, 2012-21.

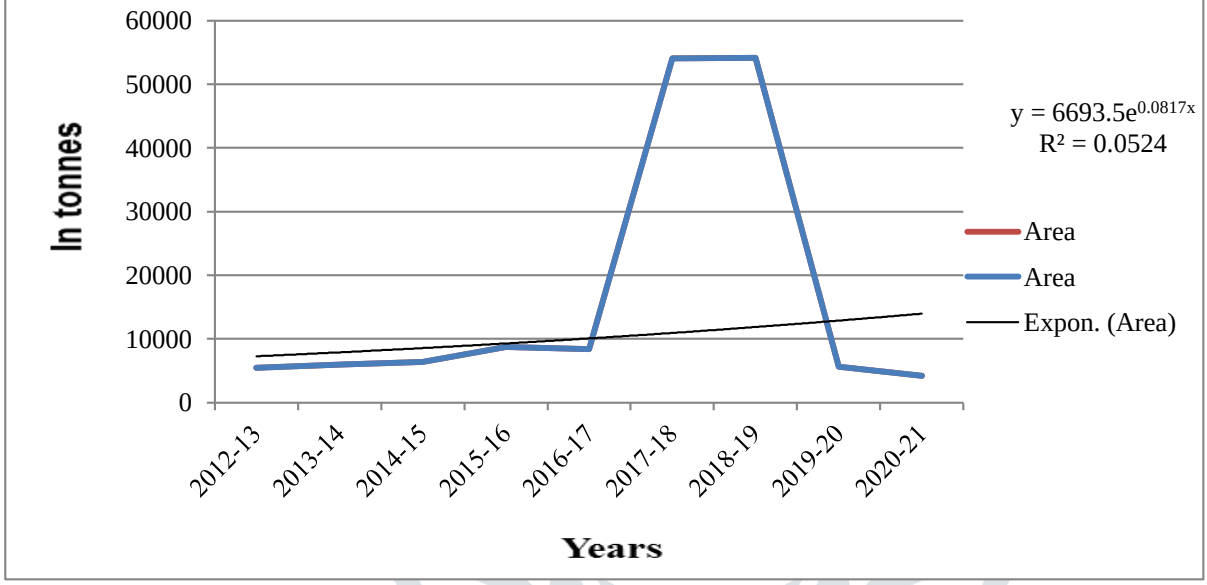
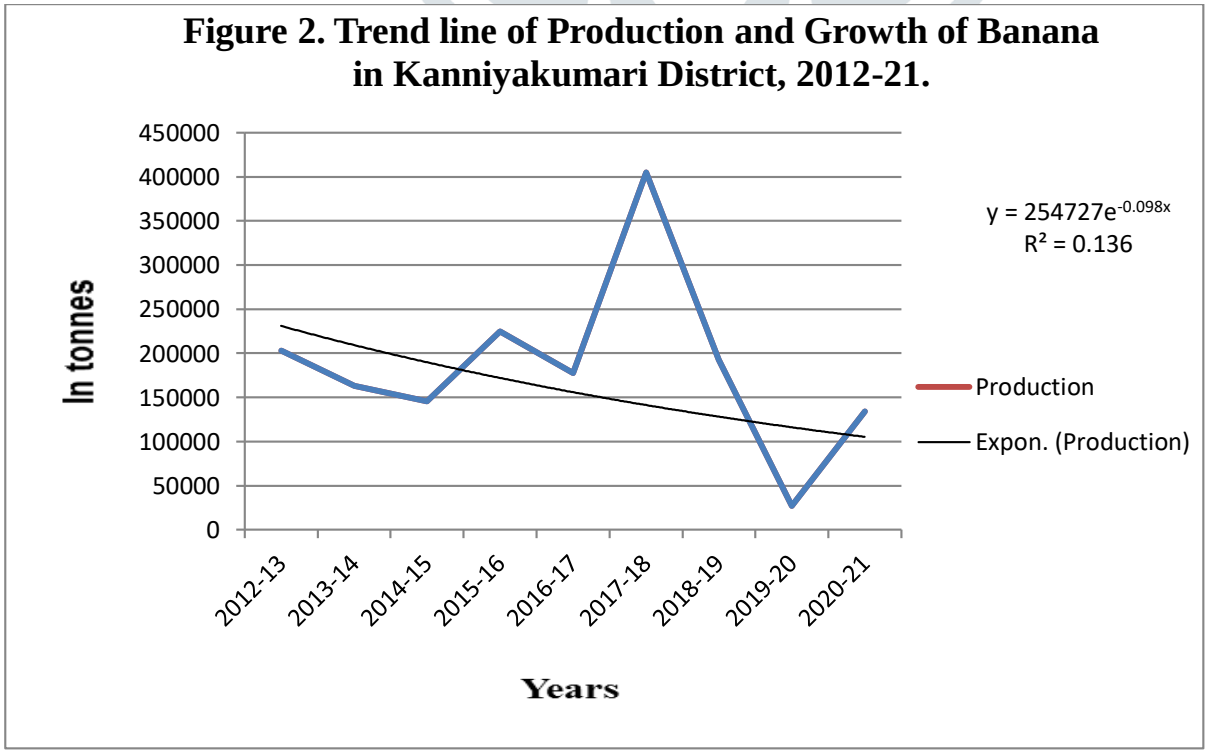


Figure 2. Trend line of Production and Growth of Banana in Kanniyakumari District, 2012-21.



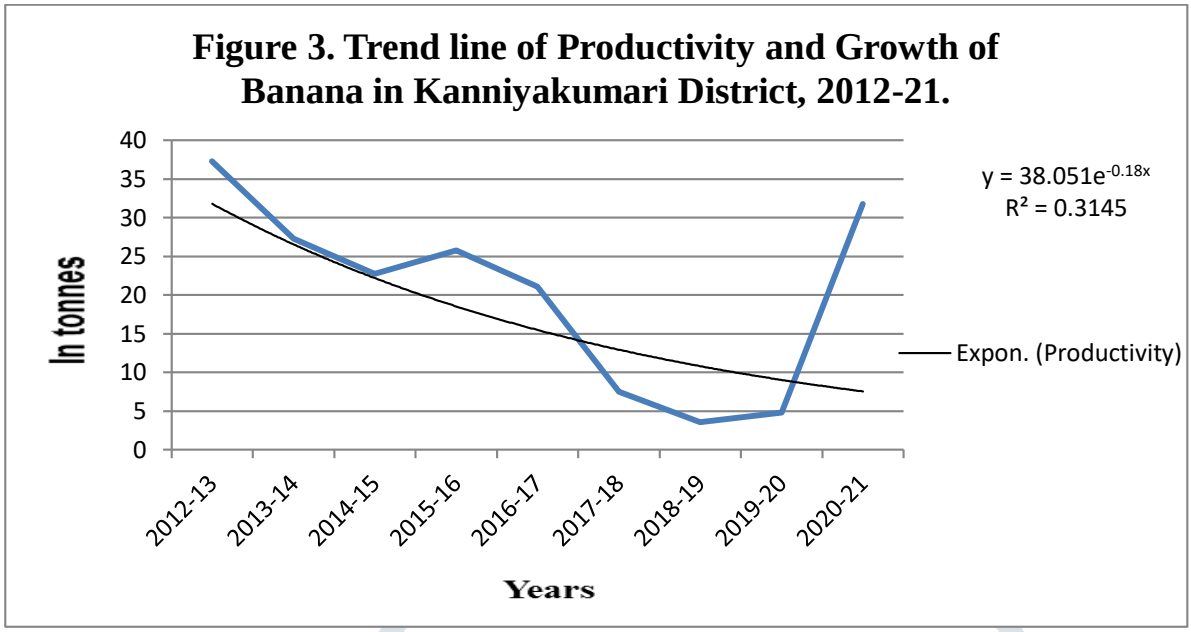


Figure 3. Trend line of Productivity and Growth of Banana in Kanniyakumari District, 2012-21.

2) Cost and returns of Banana

Table 3. Cost and Returns of Banana in the Sample Farms

(Rs. per acre)

S. No	Particulars	Cost/ Returns	Percentage
1.	Land Preparation	6,304	5.40
2.	Planting Material	6,682	5.75
3.	Human Labour	21,410	18.36
4.	Machine Labour	3,039	2.60
5.	Manures	36,961	31.70
6.	Irrigation	2,827	2.43
7.	Propping	27,897	23.92
8.	Plant Protection	3,965	3.40
9.	Interest on Working Capital	7,518	6.44
10.	**Cost A**	**1,16,603**	**100.00**
11.	Rental value of Own Land	12,605	
12.	Interest on Fixed Capital	2,146	
13.	**Cost B**	**1,31,354**	
14.	Imputed value of Family Labour	3,261	
15.	**Cost C**	**1,34,615**	
16.	Yield (tonne per acre)	13	
17.	**Gross Income/acre**	**2,34,000**	
18.	**Net Income/acre**	**99,385**	
19.	**BCR**	**1.73**	

The total cost of cultivation of banana per acre was Rs.1,34,615. Among the components manures consists the major cost component, i.e., nearly 30 per cent in banana, which is followed by propping of Banana cultivation. Irrigation cost and Machine Labour cost is the lowest share of total cost.

The average estimated yield of banana (13 tonne)/ acre. The Gross Income is Rs. 2, 34,000. The Net Income is Rs.99, 385. The BCR value is 1.73.

Conclusion:

The compound growth rate for banana area, production, productivity was -0.99, -9.51 and -7.68 respectively. It is observed that the compound growth rate is negative for area, production and productivity. This may occurred due to some climatic fluctuations and environmental changes. The trend line for productivity showed a positive trend (0.18) which may be due to improved technologies adopted by the farmers. The total cost of cultivation of banana per acre was Rs. 1, 34,615. The Gross Income is Rs. 2, 34,000. The Net Income is Rs.99, 385 The BCR value is 1.73. Thus it concluded that banana is economically profitable for the farmers.

References

[1] Alagumani, T. 2005. "Economic analysis of tissue-cultured banana and sucker-propagated banana", *Agricultural Economics Research Review*, 18(1), 81-89.

[2] Gurjar, Varghese, K.A. 2005. "Structural Changes Over time in Cost of Cultivation of Major Rabi Crops in Rajastan", *Indian Journal of Agricultural Economics*, 60(2):249-263.

[3] Koseki, Y. 2006. "Taiwan's banana-producing regions and the Japanese market", *Geographical Review of Japan*, 79(5), 216-236.

[4] Maheswarappa, B.O., Kunnal, L.B. & Patil, S.M. 1998. "Economics of Production and Marketing of Sugarcane in Karnataka", *the Bihar Journal of Agricultural Marketing*, 6(2):238-244.

[5] Ram Singh and Abhey Singh. 2008. "Economics of Production and Marketing of Mushroom in Haryana", *Indian Journal of Agricultural Marketing*, 22(2): 185-195.

[6] Ruchi Sharma and Wilson Kispotta. 2017. "Trend Analysis of Area, Production and Productivity of Banana-Kaushambi (U.P)", *International Journal of Current Advanced Research,*Vol 6; Issue 2; pp. 2187-2190.

[7] Vadivel.E. 2018. "Case Study on Quality Banana Production in Tamil Nadu Part I: Pre-Harvest Factors that Influence the Post-Harvest Quality in Banana", *Indian Journal of Natural Sciences, Vol. 8 ISSN: 0976 – 0997.*

[8] Vasuki, R. 2016. "A Study on Production and Marketing of Gingelly in Villupuram District", (*Unpublished M.Sc., (Ag.) Thesis*, Submitted to Department of Agricultural Economics, Faculty of Agriculture, Annamalai University.