

COMPOUND GROWTH RATE OF BANANA IN INDIA AND TAMIL NADU– AN ECONOMIC ANALYSIS

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ABSTRACT

Banana is an important commercial plantation crop and is one among the most traded commodities in the global market. 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. In this paper an attempt is made to analyze the growth rate of planted area, production and productivity of banana in India and Tamil Nadu. This study is mainly based on a time series data has been collected for the years 1950-51- to 2015-16. Trend analysis and the Compound Growth Rate are calculated to understand the changes during the growth rate and importance of crop. the growth rate of area, production and productivity of Banana in Tamil Nadu was 2.04, 4.38 and 4.96, respectively. The growth rate of area and production was almost equal in India and Tamil Nadu but in case of productivity the growth rate was observed a huge difference of 4.96 in Tamil Nadu whereas it was 1.85 in India.

KEYWORDS: Banana, Area, Compound growth rate.

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INTRODUCTION

Banana is the most popular fresh fruit all over the world and its name comes from the Arabic word 'banan', which means finger. The scientific name of Banana is *Musa acuminata* and *Musa balbisiana*. But the old scientific names of banana are *Musa sapientum* and *Musa paradisiacal*. Bananas are rich source carbohydrates and potassium. These are the first choice of athletes owing to its high energy potential. Banana is a large perennial herb with leaf sheaths that form the trunk like pseudostem. Banana was first domesticated in the tropical regions of South East Asia. Banana is a very popular fruit due to its low price and high nutritive value. It is consumed both in fresh and cooked form both as ripe and raw fruit. Banana is a rich source of carbohydrate and is rich in vitamins particularly vitamin B. It is also a good source of potassium, phosphorus, calcium and magnesium. The fruit is easy to digest, free from fat and cholesterol. Banana powder is used as the first baby food. It helps in reducing the risk of heart diseases when used regularly and is recommended for patients suffering from high blood pressure, arthritis, ulcer, gastroenteritis and kidney disorders.

REVIEW OF LITERATURE

Sharma and Sharma (2003) found the export and production performance of tea and concluded that the compound growth rates were positive for area, production and productivity. The contribution of Indian tea export in the total export was as high as

72.17 per cent during 1950, had declined to 23.79 per cent in 2000.

Sudeesh et.al, (2007) revealed the performance of export especially the Indian spices found that there was a huge growth in export of spices from India during the before WTO and after WTO period. Latter period also saw a significant reduction in instability in exports of spices, mainly in quantum of exports.

Jose and Jayasekhar (2008) estimated the growth trends in area, production and productivity of Arecanut in India during the period from 1971 to 2004. It revealed that the area and the production of Arecanut in India increased tremendously at the rate of 2.2 per cent and 3.2 per cent respectively. The rate of increase in both area and production is mainly due to favorable price prevailed during the period.

MATERIALS AND METHODS

The nature of the research study was based on the secondary data. The time series data pertaining on export area, production and productivity was collected from published sources of the India stat for the period (from 1950-51 to 2015-2016). The growth in area, production, productivity of banana in Tamil Nadu were estimated by using the exponential growth function of the form

$$Y = ab^t .e_t \dots \dots \dots (1)$$

Where, Y = Dependent variable,

t = Time variable,

e_t = Error term,

a & b are unknown constants to be estimated.

The data utilized in the research study was from secondary source. The time-series data regarding area, production and productivity of India and Tamil Nadu was collected from indiastat. Compound Growth Rate of banana was estimated for period covered the period 1950-1951 to 2015-2016. The growth in area, production and productivity unit value realized from exports were estimated by using the exponential growth function of the form
 The unknown constants a and b were found by applying methods of least squares by transforming the equation into logarithmic form

$$\ln Y = \ln a + t \ln b \dots\dots\dots(2)$$

Where, log Y is natural logarithm of Y, log a and log b are similarly defined. The compound growth rate 'r' was computed by using the relationship

$$r = (\text{Anti log of } (\ln b) - 1) \times 100 \dots\dots\dots(3)$$

$$\ln b = \frac{\sum (t \ln Y) - (\sum t \sum \ln Y) / n}{\sum t^2 - (\sum t)^2 / n}$$

Where,

n is number of time points.

RESULTS AND DISCUSSION
GLOBAL SCENARIO

Banana is produced in 135 nations across the tropical and subtropical region. The global banana production is 1067 lakh tonnes during 2013. The majority producers are farmers who grow the crop for either home consumption or for local markets and less than 15 per cent of the global production of more than 144 million metric tonnes is exported. The major producers of banana in 2013 along with their area, production and yield is given in Table 1.

Table 1. Area, Production and Yield of Banana during 2013 in major producing countries

Country	Area (000' ha)	Production (000' tonnes)	Productivity (tonnes/ha)
India	796	27575	34.64
China	443	12370	27.92
Philippines	446	8646	19.39
Brazil	485	6892	14.21
Others	2908	51231	17.61
World	5079	106714	21.01
India's % share	15.67	25.84	

Source: USDA (United State Dept of Agricultural foreign Agricultural Services)

Figure 1 .Global trend in area of banana (2013-14)

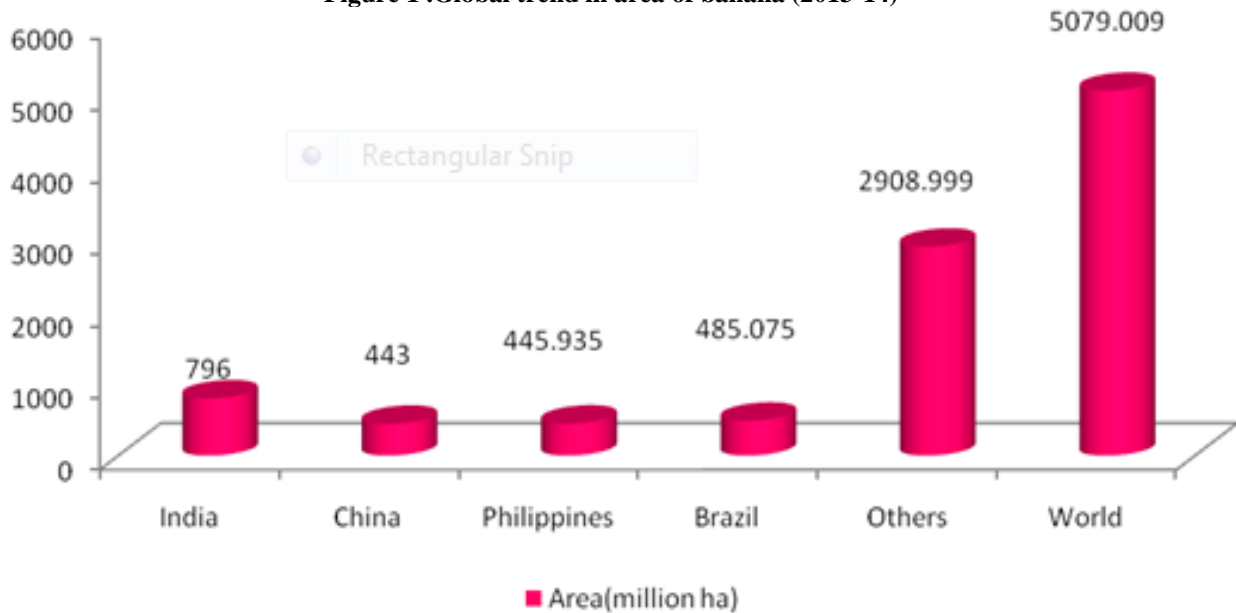


Figure 2. Global trend in production of banana (2013-14)

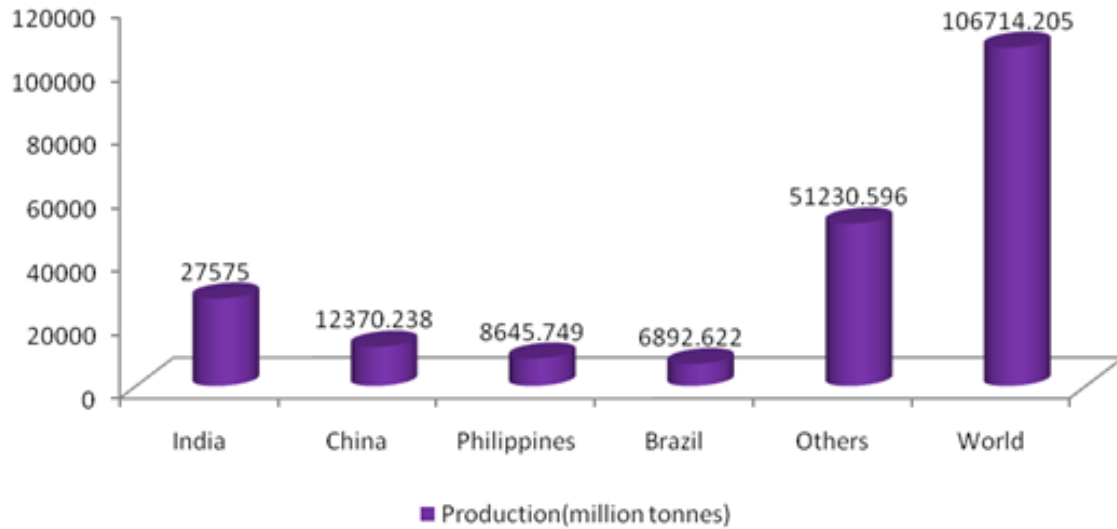
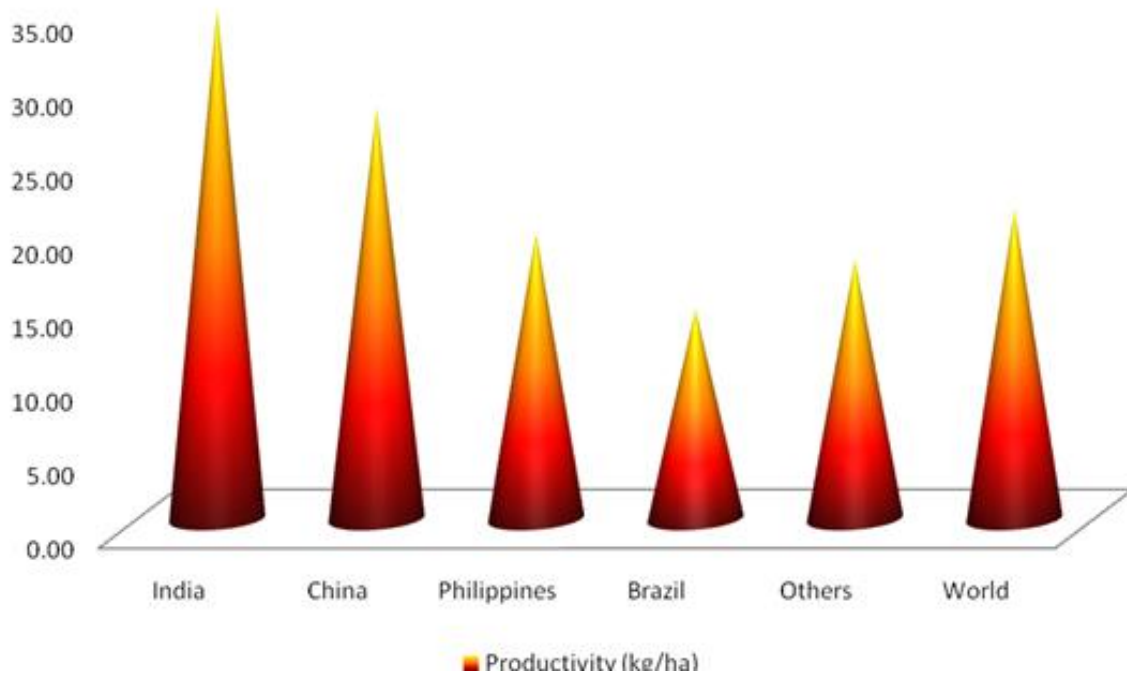


Figure 3. Global Trend in Productivity of Banana (2013-14)



In context of the production of banana, India remains top with a production of around 275 lakh tonnes with 25.84 per cent of share in the world’s production during 2013. The highest area that is used for banana production is bagged by India with around 7 lakh hectares that accounts up to 15.67 per cent in the total area of world which is around 50 lakh hectares. The country that gets maximum yield from the banana crop is India which

has a yield of approximately 34.64 tonnes per ha which is highest than the world’s productivity.

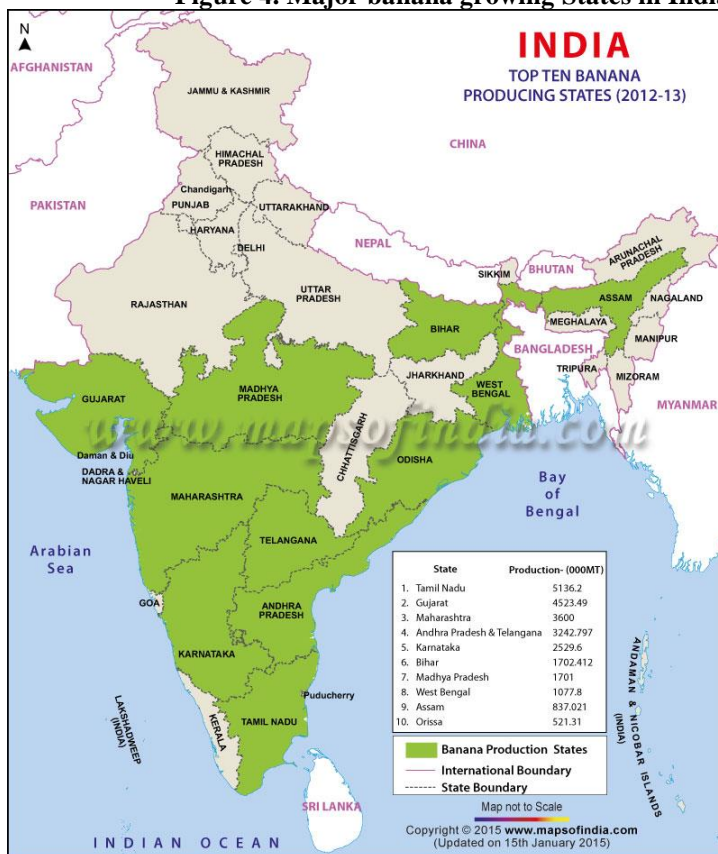
Indian Scenario

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. Production is highest in Gujarat (4324.4 thousand tonnes) followed by Tamil Nadu (4147.2 thousand tonnes). Within India, Gujarat has the

highest productivity of 64.5 metric tonnes /ha against national average of 35.6 tonnes/ha. The other major

banana producing states are Maharashtra, Andhra Pradesh and Karnataka.

Figure 4. Major banana growing States in India



TREND IN AREA, PRODUCTION AND PRODUCTIVITY OF BANANA IN INDIA

Trend in Area, production and productivity of banana in India is presented in figure 5,6 and 7. The fluctuation is observed in the production of banana over the years. The production of banana was 291 lakh tonnes in 2015-16. From 2001-02 to 2015-16, the production has increased from 125 lakh tonnes to 291 lakh tonnes. The year 2010-11 registered a highest production of banana with 297 lakh tonnes. Area and productivity of crops are the major determining factors of production. In the case of banana, the area under banana production

tends to be undulating, during 2003, the area under banana was found low area of 39 lakh hectare under cultivation which was low as compared to 2001 of 45 lakh hectares after that there was an increasing trend in the area which reached 84 lakh hectares in 2015-16, whereas the constant trend was observed in the productivity of banana. Productivity increased from 28.10 tonnes/ha in 2001-02 to 34.40 tonnes/ha in 2015-16. Higher productivity was obtained in the year 2013-14, which helped to attain higher production (291 lakh tonnes) during the same period. Figure 4 showed that productivity increases coincides with the increase in production.

Table 2. Area, Production and Yield of Banana in Major Producing States

States	2014-15			Percentage Share of States 2014-15	
	Area (000' ha)	Production (000' Tonnes)	Yield (Tonnes/ha)	Area	Production
Gujarat	67.0	4324.4	64.5	8.2	14.8
Tamil Nadu	95.2	4147.2	43.5	11.6	14.2
Maharashtra	74.0	4030.6	54.4	9.0	13.8
Andhra Pradesh	79.4	3487.3	43.9	9.7	11.9
Karnataka	102.9	2593.3	25.2	12.5	8.9
Others	403.4	10638.8	249.7	49.1	7.2
All India	821.8	29221.5	35.6	100.0	100.0

Source: National Horticulture Board

Figure 5. Trend in Area of Banana in India (2000-2015)

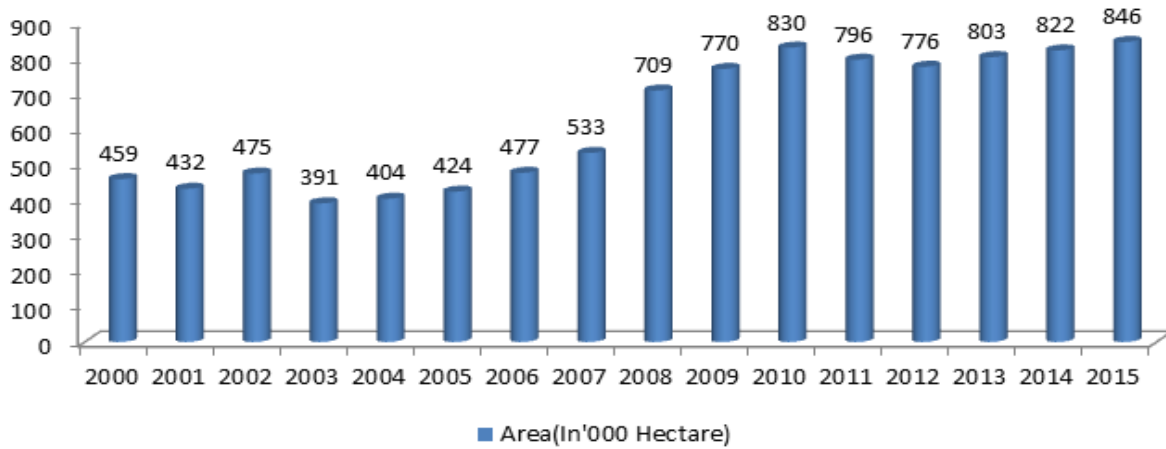


Figure 6. Trend in Production of Banana in India (2001-2015)

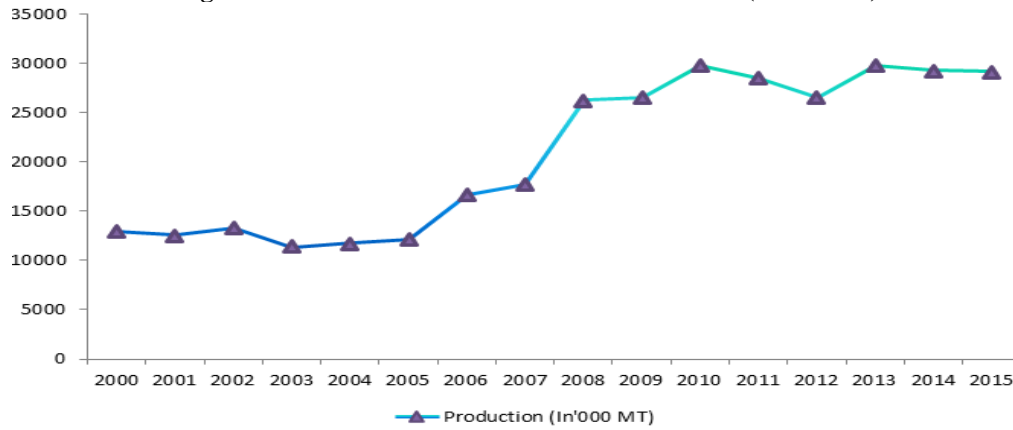
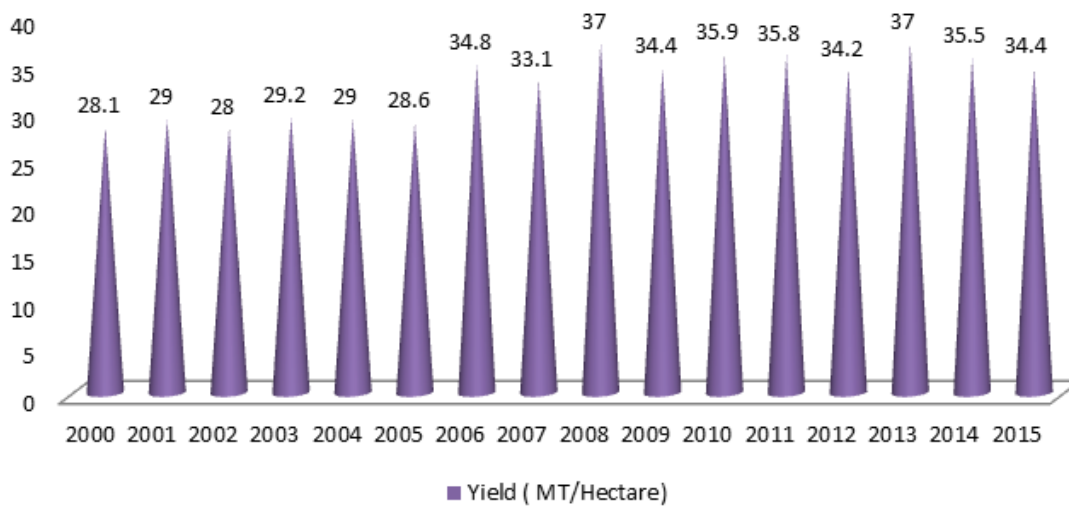


Figure 7. Trend in Productivity of Banana in India (2001-2015)



TREND IN AREA, PRODUCTION AND PRODUCTIVITY OF BANANA IN TAMIL NADU

Trend in Area, production and productivity of banana in Tamil Nadu is presented in figure 8,9 and 10. There is an up and down in the production of banana over the years. The production of banana was 42 lakh tonnes in 2015-16. From 2001-02 to 2015-16, the production has increased from 125 lakh tonnes to 291 lakh tonnes. The year 2010-11 registered a highest production of banana with 297 lakh tonnes. Area and productivity of crops are the major determining factors of production. In the case of banana, the area under banana production tends to

be undulating, during 2003, the area under banana was found low area of 39 lakh hectare under cultivation which was low as compared to 2001 of 45 lakh hectares after that there was an increasing trend in the area which reached 84 lakh hectares in 2015-16, whereas the constant trend was observed in the productivity of banana. Productivity increased from 28.10 tonnes/ha in 2001-02 to 34.40 tonnes/ha in 2015-16. Higher productivity was obtained in the year 2013-14, which helped to attain higher production (291 lakh tonnes) during the same period. Figure 10 showed that productivity increases coincides with the increase in production.

Figure 8. Trend in Area of Banana in Tamil Nadu (2000-2015)

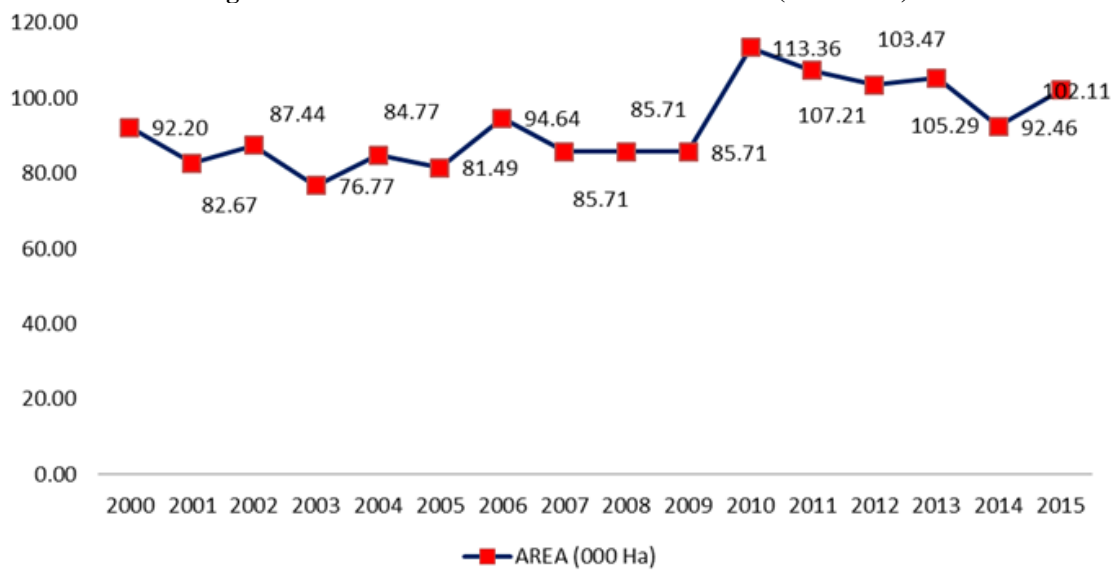


Figure 9. Trend in Production of Banana in Tamil Nadu (2001-2015)

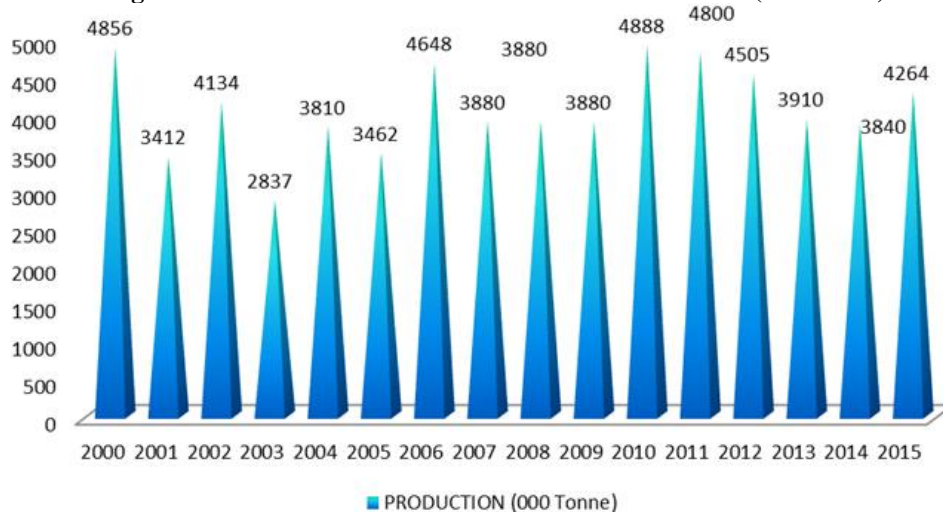
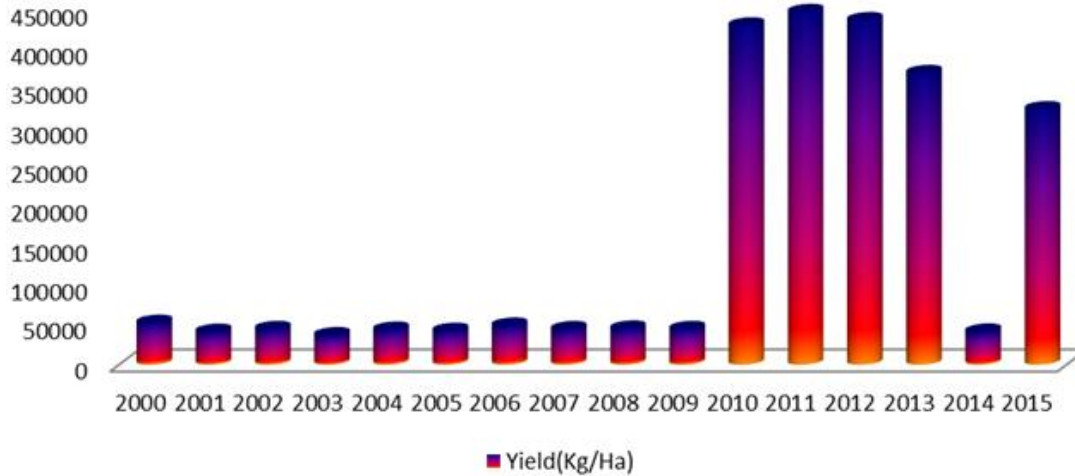


Figure 10. Trend in Productivity of Banana in Tamil Nadu (2001-2015)



COMPOUND GROWTH RATE OF AREA, PRODUCTION AND YIELD OF BANANA

The annual compound growth rate for area, production and productivity of Banana for India and Tamil Nadu is presented in Table 3. It clearly shows that the growth rate of area, production and productivity of Banana in India was 2.72, 4.63 and 1.85, respectively. Similarly, the growth rate of area, production and productivity of Banana in Tamil Nadu

was 2.04, 4.38 and 4.96, respectively. The growth rate of area and production was almost equal in India and Tamil Nadu but in case of productivity the growth rate was observed a huge difference of 4.96 in Tamil Nadu whereas it was 1.85 in India. With the success in achieving the high productivity in Tamil Nadu is due to adoption of high yielding/hybrid seeds, micro irrigation and fertigation in Tamil Nadu

Table 3. Compound Growth Rate of Area, Production and Productivity

Particulars		India	Tamil Nadu
Area	R2	0.95	0.86
	Coefficient	0.0268*** (0.0007)	0.0202*** (0.0012)
	CGR	2.72	2.04
Production	R2	0.95	0.86
	Coefficient	0.0452*** (0.0012)	0.0429*** (0.0026)
	CGR	4.63	4.38
Productivity	R2	0.95	0.54
	Coefficient	0.01839*** (0.0008)	0.0484*** (0.0069)
	CGR	1.85	4.96

Note: *** Significant at 1 per cent level

CONCLUSION:

The compound growth rate of area, production and productivity of Banana in India and Tamil Nadu was estimated. The growth rate of area and production was almost equal in Tamil Nadu and India but in case of productivity the growth rate was observed a huge difference of 4.96 in Tamil Nadu whereas it was 1.85 in India. With the success in achieving the high productivity in Tamil Nadu is due to adoption of high yielding/hybrid seeds, micro irrigation and fertigation in Tamil Nadu.

REFERENCE:

Jose, C. T. and Jayasekhar, S. 2008. The growth trends in area, production and productivity of Arecanut in India. *Agricultural Situation in India*, 65(1): 135-140.

Sadesh. J., Pouchepparadjou.A., Anil Kuruvila, Rammohan.J. andUmamaheswari. L. 2007. An economic analysis- export performance of Indian Spices, *Agricultural Situation in India*, 49 (5):593-601.

Sharma, H.R., and Sharma, R.K. 2003. Production and Export Performance of Indian Tea - A

Temporal and Cross-sectional Analysis, *Agricultural
Economic Research Review*, 16(2): 152-170.