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ECONOMY OF KONGU REGION

S.No.	Name	Title	Page No.
1.	R.Subbulakshmi Dr.V.Duraisingh	AGRICULTURAL COMMODITY EXPORTS IN INDIA: AN ECONOMIC ANALYSIS	1
2.	R.Vidhya Dr. N.Chithra	THE PROFILE AND ECONOMIC ASPECTS OF ERODE DISTRICT	5
3.	R. Rajeswari	STATUS AND DEMAND FOR BDS SERVICES IN TIRUPPUR DISTRICT.....	8
4.	R. Gopalasundar	THE DEMOGRAPHIC AND CLIMATIC CONDITION OF NILGIRIS DISTRICT IN THE ECONOMIC ASPECTS.....	10
5.	A. Ahilandeshwari	ECONOMY OF COIMBATORE.....	12
6.	K. Ashokrani,	INDUSTRIAL GROWTH IN TIRUPPUR DISTRICT - AND ECONOMIC ANALYSIS.....	15
7.	S.Madheswaran & Dr.A. Saravana Durai	A STUDY ON THE PULSES CULTIVATION IN ERODE DISTRICT	17
8.	A.Bharatharathna	CROPPING PATTERN CHANGE AND FOODGRAINS PRODUCTION IN COIMBATORE DISTRICT.....	22
9.	Dr. Mrs. R. Vijayalakshmi R. Sakthidevi	A STUDY ON STRESS MANAGEMENT AMONG MEDICAL COLLEGE STUDENTS IN COIMBATORE.....	25
10.	R. Nagarajan	ERODE DISTRICT – AN ECONOMIC OVE VIEW.....	28
11.	Mrs. M. Mononmani	AREA, PRODUCTION AND PRODUCTIVITY OF COTTON IN COIMBATORE DISTRICT.....	35

AREA, PRODUCTION AND PRODUCTIVITY OF COTTON IN COIMBATORE DISTRICT

Introduction

Agriculture in most developing economies is the core sector providing a livelihood to a significant proportion of the population, especially in rural areas. Since this sector faces the larger brunt of under employment, unemployment and poverty, a growing agriculture and allied sector is expected to contribute vastly to overall growth and poverty alleviation. Increasing the productive capacity of agriculture through higher productivity has been important goal in developing countries. (Subhalakshmi, 2006).

Cotton is one of the important ancient commercial crops of India. India is the third largest producer of cotton after the US and China in terms of land usage. Cotton seed oil has become a significant contributor to national edible oil pool. Cotton cultivation provides livelihood to several million farmers and several million people in trade, processing and textile industry besides in hybrid seed production. Cotton crop occupies nearly 5 percent of the gross cropped area which is one of the highest among the various cash crops.

The study of growth and instability of agriculture is important concept in estimating the future production, yield and area. With the help of these estimates, it is possible to take policy decisions to meet the future demands of the country. The increasing population creates a demand for agricultural commodities. To meet the future demand of agricultural production, it is essential to study the growth and performance of major commercial crops .

In view of the above discussion the present investigation was therefore undertaken in

- (a) Estimating the annual trend rates and extent of instability of cotton production.
- (b) Finding out the contribution of area and productivity in cotton production and
- (c) Examining the factors influencing the production of cotton.

Methodology

The area of study is restricted to Coimbatore district in Tamil Nadu, since Coimbatore district is the main contributor of cotton production in Tamil Nadu. Since the present study is based on time series data from 1991-92 to 2007-08, required data were collected from Season and Crop Reports of Tamil Nadu maintained by district statistical office. The following statistical tools were used to analyse the data.

(i) Exponential Growth function

The exponential growth rate of area, production and productivity were completed by fitting the exponential function of the

$$Y = AB^t$$

$$\text{Log } y = \log A + t \log B$$

$$\begin{aligned} \text{Exponential growth rate} &= \text{antilog}(B-1) \\ \text{growth Percentage} &= \text{Antilog of } (B-1) \times 100 \end{aligned}$$

(ii) Instability Index

In order to study the instability in area production and productivity of cotton in Coimbatore district, the Coppock's instability index, coefficient of variation were estimated

The algebraic form of it is

$$V\log = \frac{\sum \log \frac{x_{t+1}}{x_t} - M}{N}^2$$

The stability index (I.I) = $\text{Antilog} \sqrt{V\log} \times 100$

- X_t = area, production/productivity of a crop in year (t)
 N = Number of years minus one
 M = The arithmetic mean of the difference between log of x_t and x_{t-1}, x_{t+1} and x_{t+2} etc.
 vlog = the logarithmic variance of the series

(b) Coefficient of Variation

The relationship between standard deviation and arithmetic mean expressed in terms of percentage was found through coefficient of variation. It takes the form symbolically

$$V\log = \frac{1}{N} \sqrt{\frac{\sum_{t=1}^n (x_i - \bar{x})^2}{\bar{x}}}$$

Where N refers to the total number of observations and x_i refers to the variables such as area, production and productivity of the crop and x is the mean of the distribution of the variables under study. If the coefficient of variation is less, it indicates that the data is more stable, more uniform, more consistent or more homogenous and vice-versa.

(c) Simple Decomposition Model

To measure the contribution of area and yield and its interaction towards increasing production of cotton in Coimbatore district, the following method was used

$$P = A_o (Y_n - Y_o) + Y_o (A_n - A_o) + \Delta A \Delta Y$$

Where

- P = Change in the production of cotton crop
 A_o = Area of cotton crop in the base year
 A_n = Area of cotton crop in the current year
 Y_o = Yield of cotton crop in the base year
 Y_n = Yield of cotton crop in the current year
 ΔA = Change in the area of cotton crop (A_n - A_o)
 ΔY = Change in the yield of cotton crop (Y_n - Y_o)

Where the first term in the equation is productivity contribution of cotton crop, second term is area contribution of cotton crop, third is interaction effect of both area and yield of cotton crop.

Result and discussion

A. Growth rates of area, production and productivity of cotton

Exponential growth rates of area, production and productivity of cotton were estimated for Coimbatore district for the reference period which is shown in table-1

Table- I
GROWTH RATES OF AREA, PRODUCTION AND PRODUCTIVITY OF COTTON IN COIMBATORE DISTRICT

District	Variables	Constant coefficient	Growth rate	R ²	't' value	S. E
		(a)	(b)			
Coimbatore	Area	-0.094	-19.30	0.7142	-4.999	0.224
	Production	-0.113	-23.00	0.6231	-4.006	0.334
	Productivity	-0.021	-4.81	0.1649	-1.040	0.334

Foot Note: Calculations are based on data compiled from Season and Crop

Reports of Tamil Nadu

*Significant at 1% level

The table above shows that all the variables such as area, production and productivity have registered a negative growth rate to the extent of 19.30 percent, 23 percent and 4.81 percent respectively over the years. The coefficient of determination R^2 showed that 71.42 percent, 62.31 percent and 16.49 percent of the variation in the above mentioned variables respectively were due to the influence of time factor and the remaining 28.58 percent, 37.67 percent and 83.51 percent of changes were incidental. From this, it is very clear that time factor had marginal influence over productivity changes.

B. Instability of area, production and productivity of cotton

In this study, an attempt is made to compute the magnitude of changes that have taken place in area, production and productivity by computing variability indicators such as co-efficient of variation (C.V) and Instability Index (I.I). The results are given in table- 2.

TABLE-2
INSTABILITY OF AREA, PRODUCTION AND PRODUCTIVITY OF COTTON IN COIMBATORE DISTRICT

variables	M	S.D.	C.V.	I.I
Area	82.18	27.41	33.35	48.77
Production	69.95	27.46	39.25	54.12
Productivity	83.28	15.27	18.34	43.33

Foot Note: Calculation are based on data compiled from season and Crop

Report of Tamil Nadu

M = Mean
S.D = Standard Deviation
C.V. = Coefficient of variation
I.I = Instability index

From the variability indices calculated, it is understood that the magnitude or extent of variation (C.V.) was more for the production aspect of cotton. In other words increase in mean level of production (69.95 percent) was achieved with 39.25 as magnitude of variability.

The average area under cotton cultivation was 82.18 percent with 33.35 percent as its magnitude of variability. With regard to productivity performance, the average yield of cotton was 83.28 percent with the extent of variation as 18.34. The inconsistency was therefore more in area and production.

The instability indices of area, production and productivity of cotton did not show much difference. It was 48.77 percent, 54.12 percent and 43.33 percent respectively in the above mentioned variables.

Conclusion

In order to improve the cultivation of cotton crop in Coimbatore district the following suggestions are made to bring about remarkable change in term of area, production and productivity.

1. Provision of technical guidance and quicker certification system.
2. Ensuring quality pesticides by increasing the number of agro service center in the district to meet the increased demands of farmers.
3. Research and development efforts need to be made on improving the technology and make it more cost effective.
4. Imparting training to the farmers in aspects such as water management, layout selection, use of better inputs such as high yielding variety seeds, plant protection and irrigation.
5. More incentives should be given to increase the export of cotton fabrics by exploiting the potential in raising cotton production through improvement in yield in the district.

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