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ESTIMATING GROWTH RATES, DECOMPOSITION ANALYSIS AND INSTABILITY OF GROUNDNUT CROP PRODUCTION IN ANDHRA PRADESH

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ABSTRACT

The main objectives of the study are to examine the trends in area, production and productivity of groundnut in Andhra Pradesh over a period of 1995-96 to 2010-2011. Compound growth rates of area production and productivity were estimated by fitting semi log trend equation. Decomposition of output growth of groundnut was examined by fitting component analysis model. The study analyzed that area, production and productivity had decreased during the study period i.e. 1995-96 to 2010-2011.The compound growth rates of area production and productivity of ground nut over the period shows negatively non significant. The coefficient of variations of area production and productivity were 15.2, 41.4and 31.69 respectively indicating that there is lot of variation in production and productivity of groundnut in Andhra Pradesh. Further, the study conducted a decomposition analysis to determine the contribution of different components to the growth rate. The decomposition analysis revealed that in the total production of groundnut was completely due to the change in area under the crop as the yield and interaction effects were very small.

INTRODUCTION

Oil seed production has fallen short of the requirement as a result of increasing per capita consumption in the recent past. This necessitated a heavy impact at the cost of huge foreign exchange. Ground nut ranks first in India among oil seed crops. It covers 45% of area and accounts for 55% of production of the total oil seeds. India is rated as the third largest producer of groundnut in the world with annual production of over 5-6 million tons. Gujarat, Andhra Pradesh, Tamil Nadu and Karnataka are the leading producers in the country and accounts for nearly 75% of the total output. Groundnut contributes to nearly 25% of total oil seed production in the country. Nearly 75% output occurs in June-September and the rest during November-March known as kharif and rabi seasons respectively. The studies undertaken by research workers at various times mostly related to cereal crops like paddy and wheat very limited work has been done on groundnut which is the major oil seed crop of the Andhra Pradesh. Thus, considering the importance and need, the present study has been taken. This is with the above consideration in view, that the present study has been taken up to analyze the trends in the production of groundnut in A.P.

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The specific objectives of the study are as follows

1. To study the trend and growth of area, production and productivity of groundnut in Andhra Pradesh.
2. To examine the contribution of area productivity towards increasing the production; the magnitude and instability for the groundnut crop.

MATERIALS AND METHODS

The present study utilizes the time series data (1995-96 to 2010-2011) on area, production and productivity of groundnut was collected from various publications and websites of Directorate of Economics and Statistics Government of India, Agricultural Statistics at a glance and Bureau of Economics and Statistics of Andhra Pradesh state. The exponential function $Y = A\ B^t$ was fitted to the data to compute the compound growth rates.

Compound growth rate (r) = (antilog b -1)*100

The compound growth rates were tested for their significance by the student's' test. The coefficient of variation (c. v) was used as the measure of instability.

Coefficient of variation = Standard deviation / Mean *100

To measure the contribution of area and productivity towards increasing production of groundnut decomposition analysis was used.

$$P = A0 (Yn - Y0) + Y0 (An - A0) + \Delta A \Delta Y$$

Where

P = change in production
Y0 = Area in base year
Y0 = yield in the base year
Yn= yield in the current year
An= area in the current year
ΔA = change in area (An-A0)
ΔY = change in the yield (Yn - Y0)

Where, the first term is the productivity contribution, second term is the area contribution and the last term is the interaction effect.

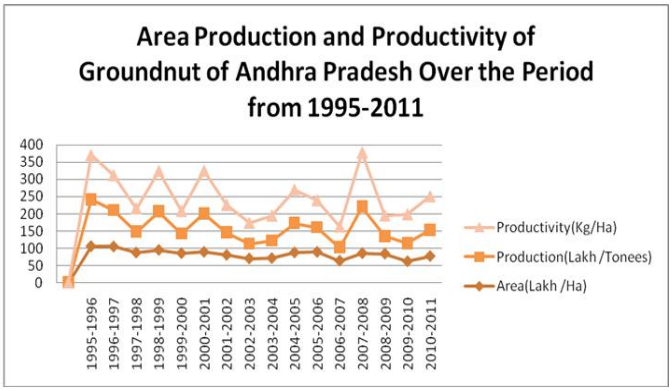
RESULTS AND DISCUSSION

It can be revealed from the Table 1 that the area of ground nut in 1995-96 was 22.2 lakh ha and decreased to 16.22 lakh ha in 2010-11similarly the production of ground nut in 1995-96 was 26.25 lakh tones and decreased to 14.57 lakh tones in 2010-11. The productivity of ground nut in 1995-96 was 1183 kg/ha and decreased to 898 kg/ha in 2010-11. A negative annual percentage change has been in area production and productivity of ground nut over the study period (1995-96 to 2010-11)in Andhra Pradesh except in 1998-99, 2000-01, 2003-04, 04-05, 05-06, 07-08, and 2010-11.

Area, production and productivity of groundnut show 15.2, 41.4 & 31.7 respectively. The highest c. v was noticed in production of groundnut. The instability in production increased with rapid growth of production. In other words, high growth in production is accompanied by increased variability in production, thus increasing the risks associated in the production of groundnut.

Table 3. Decomposition analysis of Area Production and Productivity of Groundnut of Andhra Pradesh Over the Period from 1995-2011

Area effect (ΔA)	Production effect (ΔP)	Yield effect (ΔY)	Interaction effect
7.693	0.60	-5.484	-1.606



In order to find out the contribution of area, production and productivity and the interaction of the two in increasing the production, decomposition analysis was carried out.

Table 1. Area Production and Productivity of Groundnut of Andhra Pradesh Over the Period from 1995-2011

Year	Area (Lakh Hects.)	% change over the year	Production (Lakh Tonne.)	% change over the year	Productivity (Kgs. /Hect.)	% change over the year
1995-1996	22.2		26.25		1183	
1996-1997	21.98	-0.991	20.45	-22.095	930	-21.386
1997-1998	18.34	-16.561	11.56	-43.472	630	-32.258
1998-1999	19.92	8.615	21.55	86.419	1082	71.746
1999-2000	17.95	-9.890	10.89	-49.466	607	-43.900
2000-2001	18.74	4.401	21.43	96.786	1145	88.633
2001-2002	16.91	-9.765	12.5	-41.671	739	-35.459
2002-2003	14.7	-13.069	8.2	-34.400	559	-24.357
2003-2004	14.93	1.565	9.86	20.244	660	18.068
2004-2005	18.41	23.309	16.39	66.227	891	35.000
2005-2006	18.76	1.901	13.66	-16.656	728	-18.294
2006-2007	13.34	-28.891	7.43	-45.608	557	-23.489
2007-2008	17.95	34.558	26.04	250.471	1449	160.144
2008-2009	17.66	-1.616	9.73	-62.634	551	-61.974
2009-2010	13.01	-26.331	10.07	3.494	774	40.472
2010-2011	16.22	24.673	14.57	44.687	898	16.021

Compound growth rates and coefficients of variation clarified the disquieting trend in the production. Table 2 shows that the area, production and productivity of groundnut in A.P have significant negative trends of 0.019, 0.036 and 0.017 per cent per annum respectively over the study period. The instability in production is reflected by the perusal of Table 3.

Table 2. Compound growth rates of Area Production and Productivity of Groundnut of Andhra Pradesh Over the Period from 1995-2011

	Area	Production	Productivity
CAGR Value	-0.0194	-0.0361	-0.0171

The results are presented in Table 4. It is clearly observed from the table that, during the overall period, the in the total production of groundnut was completely due to the change in area under the crop as the yield and interaction effects were very small.

Table 4. Statistical tools of Area Production and Productivity of Groundnut of Andhra Pradesh Over the Period from 1995-2011

Statistical tools	Area	Production	Productivity
AM	17.56	15.03	0.836
SD	2.670	6.235	0.2651
CV	0.152	0.414	0.3169

Therefore, it is concluded that production growth in groundnut over the past 16 years has been slow & unstable with substantial temporal variation in the state.

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