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Growth and Instability of Gnoundnut Area, Production and Yield in the Area of Rayalaseema

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ABSTRACT

All the other sectors of economy are also concerned with the performance of the agriculture sector. Agriculture is the backbone of the Indian Economy. In case of oilseeds, India is the fourth largest producer, in terms of output and second in terms of area. Because of increasing population, increasing demand of oil, unfavourable weather conditions, lack of irrigation and marketing facilities, lack of new technology, the production of oilseeds is decreasing in India. India is one of the World's largest producers of groundnut .Groundnut for edible uses account for two-thirds of the total crop consumption. Groundnut is the most important oilseed crop accounting for about 20 percent of the cropped area in the state of Andhra Pradesh. The main objectives of the study are to find out the trends in area, production and yield of the Groundnut crop and to study the reasons for variations in area, production and yield of Groundnut crop.

KEYWORD: Agriculture, Economy, Technology

India is the one of the agrarian economy, even at present about 65 percent of working population is engaged in agriculture, and allied activities. The significance of agriculture in India arises from the fact that the development in agriculture is an essential condition for the development of the National Economy. All the other sectors of economy are also concerned with the performance of the agriculture sector. Agriculture is the backbone of the Indian Economy. In case of oilseeds, India is the fourth largest producer, in terms of output and second in terms of area. Oilseeds, sharing 14 percent of the gross cropped area and accounting for nearly 5 percent of gross national product and 10 percent of the value of all agricultural productivity. Being employment intensive, about 14 million persons are engaged in the production of oilseed industries and another 5 million in the oilseed processing industries. But in India, because of increasing population, increasing demand of oil, unfavourable weather conditions, lack of irrigation and marketing facilities, lack of new technology, the production of oilseeds is decreasing in India.

Groundnut is a species in the legume family fabaceae native to South Africa. It is an annual herbaceous plant growing to 30 to 50 cm tall. The leaves are apposite pinnate with four leaflets, each leaflet 1 to 7 cm long and 1 to 3 cm broad. The flowers are a typical pea flower in shape. 2 to 4 cm across, yellow with reddish veining. The flower of the groundnut is borne above ground and after it withers, the stalk elongates bends down and forces the ovary underground. When the seed is mature, the inner lining of the pods changes colour from white to a reddish brown. The entire plant, including

most of the roots, is removed from the soil during harvesting. The pods begin in the orange veined, yellow pedaled, pea-like flowers, which are borne in auxiliary clusters above ground. Following self-Pollination, the flowers fade. The stalks at the bases of the aviaries, called pegs, elongate rapidly, and turn downward to bury the fruits. Several inches in the ground to complete their development. The pods act in nutrient absorption. The fruits have wrinkled shells that are constricted between the two to three seeds. Groundnut is also known as Peanuts, earthnuts, goobers, Pinders, Jack nuts, manila nuts and monkey nuts.

India is one of the World's largest producers of groundnut. But they account for a small part of international trade because most of their production is consumed domestically as groundnut oil. 90 percent of India's production is processed in to oil. Only a nominal amount of handpicked select-grade groundnut is exported.

Groundnut for edible uses account for two-thirds of the total crop consumption. The principal uses are salted, shelled nuts, Peanut butter, Peanut brittle, candy bars and nuts that have been roasted in the shell salted groundnut is usually roasted in oil and packed in retail size, plastic bags or hermetically sealed cans. Dry roasted, salted groundnut is also marketed in significant quantities.

Groundnut oil is often used in cooking, because it has a mild flavour and burns at a relatively high temperature. Under the name plumpy 'nut' two small bags per day are given by the World Health Organization as a surviving base to many children Groundnuts are rich sources of protein and monoun saturated fat. Recent research on groundnut in general has found antioxidants and other chemicals that may provide health benefits. Groundnut is a significant source of reoveratrol, a chemical studied for potential anti – aging effects. Because Groundnut is considered an incomplete protein containing relatively low amounts of the essential amino acids, Lysine, cystine and Methionine, it is advised to be sure that a diet or meal with groundnut as a staple also include complementary foods such as dairy or whole grain. Groundnut is also an unbalanced source of fat because they are devoid of required omega 3 fats. Some brands of groundnut butter are fortified with omega – 3 in the form of flaxseed oil to balance the ratio of Omega – 3 to Omega – 6.

Groundnut may be contaminated with the mold Aspergilla's flavours, which produces a carcinogenic substance, called of aflatoxin. While this substance quickly causes liver cancer in rats, humans are far more resistant. Lower quality specimens, particularly where mold is evident are more likely to be contaminated. To minimize this problem, make sure to obtain your groundnut from a reputable source and store the groundnut in a cool dry place such as the refrigerator or freezer.

Groundnut has a variety of industrial and uses. Paint, Varnish, lubricating oil, leather dressings, furniture Polish, insecticides, and nitro-glycerine are mode from Groundnut Oil. Soap is made from saponified oil and many cosmetics contain Groundnut Oil and its derivatives. The protein portion of the oil is used in the manufacture of some textile fibers. Groundnut shells are put to use in the manufacture of plastic, wallboard, abrasives and fuel. They are also used to make in cellulose and mucilage. Groundnut plant tops are used to make hay. The protein cake residue from oil processing is used as an animal feed and as a soil fertilizer. It is estimated that half-a-billion people on Earth rely on the groundnut as their primary source of protein. Groundnut is the most important oilseed crop accounting for about 20 percent of the cropped area in the state of Andhra Pradesh.

Therefore, the main objectives of the study are:

1. To find out the trends in area, production and yield of the Groundnut crop.
2. To study the reasons for variations in area, production and yield of Groundnut crop.

To fulfil the first objective of the study, i.e., to determine the trends, the compound growth rates of area, production and yield of the Groundnut crop is estimated by fitting exponential functions for both the periods before and after the green-revolution separately. The growth rates are estimated for Rayalaseema regions. The compound growth rate was calculated by adopting the following exponential function.

$Y = AB^t$ (1)

Where Y = Area/ production/yield

A = Constant

B = Coefficient of time

t = time (Years)

r = Compound growth rate

The percentage of compound growth rate

r = (B-1) 100

To measure the instability in oilseed crops, coefficient of variation was calculated

$$CV = \frac{\text{standard devation}}{\text{Mean}} X100$$

DATA:

The data relating to area, production and yield under Groundnut oilseed crop. Groundnut in the state was obtained from the various issues of Seasons and Crop Reports of Andhra Pradesh, Statistical Abstract of Andhra Pradesh, Hand Book of Statistics, issued by the Director Bureau of Economics and Statistics, Hyderabad. The present study was carried out for the three period's i.e.

1. Pre-green revolution and green revolution period=1965-1985
2. Post-green revolution and post TMO (Technology Mission on Oilseeds) period= 1985-2005
3. Over all period = 1965-2005.

To fulfil the first objective of our study, the growth and instability in Area, production and yield of the Groundnut, the exponential form was fitted (equation (1) in Methodology). The estimated equation for the crops under Area, production and yield in Rayalaseema region analyzed. The instability in the crop is also estimated.

Rayalaseema - Groundnut

Area-Period I: The estimated exponential equation of area under groundnut crop in Rayalaseema region during the period I is

$$\hat{Y} = (115.3954)\ (0.8229)^t$$
$$(0.6126)$$

CGR = -17.7074 CV = 31.34

From the above equation, the regression coefficient i.e. the value of 'B' is 0.8229. It expresses that the average annual increase over the previous years is 0.82. Therefore, the average annual growth in area under groundnut crop over the previous year is 82.3 percent. The compound growth rate of groundnut area, during the period I is –17.71. It reveals that the area under groundnut is decreasing. But this decrease in groundnut area is not a significant decrease. The coefficient of variation is 31.34 percent, which shows that 31.34 percent of variation in groundnut area was recorded during I period in Rayalaseema region. Therefore, instability in groundnut area was 31.34 percent.

Area- period II: The fitted exponential equation of area under groundnut crop in Rayalaseema region is

$\hat{Y} = (0.4454)\ (1.3464)^{*t}$
(2.5073)
CGR = 34.64 CV = 24.71

In the above equation, the regression co-efficient i.e. the value of B is 1.3464. It expresses that the average annual increase over the previous years is 1.35. Therefore, the average annual growth in area under groundnut crop over the previous year is 1.35 percent. The compound growth rate of groundnut area, during the period II is 34.64. It reveals that the area under groundnut is increasing. It is also observe that the average annual increase in groundnut area is a significant increase. The coefficient of variation is 24.71. It means almost 24.71 percent of instability in groundnut area was observed during the II period.

Area-Period III: The calculated exponential equation of area under groundnut crop for the period III is

$\hat{Y} = (0.001)\ (2.3340)^{*t}$
(25.1065)
CGR = 133.4011 CV = 33.16

In the above fitted equation, the regression coefficient i.e. that value of 'B' is 2.3340. It expresses that the average annual increase over the previous years is 2.33 Therefore; the average annual growth area under groundnut crop over the previous year is 2.33 percent. The compound growth rate of groundnut area, during the period III is 133.4011. It reveals that the area under groundnut is increasing. It is also observe that the average annual increase in groundnut area is a significant increase. The coefficient of variation is 33.16. It means 33.16 percent of instability in groundnut area was observed during the third period.

Comparing the three periods, an insignificant growth was recorded during the period I, i.e. the pre-green revolution and green revolution period. But during the period II, i.e. the post-green revolution and TMO period, a significant growth in groundnut area was noticed. This is due to implementation of green revolution in Indian agriculture, application of high yielding varieties, fertilizers and pesticides, new technology in agriculture may lead to a significant growth in groundnut area in Rayalaseema region, observing the overall period (40 Years) i.e. period III, a significant increase in groundnut area was observed. Here, the green revolution in agriculture brought a tremendous increase in agriculture.

Rayalaseema – Groundnut

Production–Period I: The estimated exponential equation of groundnut production in Rayalaseema region is

$\hat{Y} = (0.0065)\ (1.7051)^{*t}$
(2.0889)
CGR = 70.5092 CV = 23.48

From the above-calculated equation, the regression coefficient i.e., the value of 'B' is 1.7051. It expresses that the average annual increase in production over the previous year is 1.71. Therefore, the average annual growth in production of groundnut crop is 1.71 percent. The compound growth rate of groundnut production during the period I is 70.51. It reveals that the production under groundnut is increasing. It is also observed that the average annual increase in groundnut production is a significant increase. The calculated coefficient of variation during the period I is 23.48 percent. Hence, it is noticed that the instability in groundnut production is 23.48 percent.

Production- Period II: The computed non-linear equation of production of groundnut crop in Rayalaseema region in period II is

$\hat{Y}$ = (164.8461) $(0.8846)^t$
(0.4123)
CGR = -11.5382 CV = 31.70

From the above computed equation, the regression coefficient i.e., the value of B is 0.8846. It reveals that the average annual increase production of groundnut over the previous year is 0.88. Therefore, the average annual growth in production under groundnut crop is 0.88 percent. The compound growth rate of groundnut production during the period II is – 11.5382. It reveals that the production under groundnut is decreasing. But this decrease in groundnut output is an insignificant decrease in Rayalaseema. The computed coefficient of variation during the period II is 31.70 percent. The instability in groundnut production in Rayalaseema region was 31.70 percent.

Production – Period III: The estimated equation of production under groundnut crop in Rayalaseema region is

$\hat{Y}$ = (0.0001) $(3.2065)^{*t}$
(43.7299)
CGR = 220.6497 CV = 40.19

In the above fitted equation, the co-efficient, i.e. the value of 'B' is 3.2065. It expresses that the average annual increase over the previous years is 3.21. Therefore, the average annual growth in production of groundnut crop over the previous year is 3.21 percent. The compound growth rate of groundnut production during the period III is 220.65. It reveals that the production under groundnut is increasing. It is observed that the average annual in groundnut production is a significant increase. The estimated Coefficient of Variation is 40.19 percent. It reveals that the instability in groundnut production is 40.19 percent.

Comparing the three periods, a significant growth was recorded during the first period i.e., the pre-green revolution and green revolution period. This is due to implementation of new technology in agriculture. But, during the second period, i.e., Post green revolution and TMO period, an insignificant growth in groundnut production was noticed. This is because of, in Rayalaseema region, irrigation and rainfall variables are discouraging the production of groundnut. Finally, observing the over all period, i.e. this period, a significant growth in groundnut production was recorded. The implementation of high yielding varieties, fertilizers and pesticides may leads to a significant growth in groundnut production in Rayalaseema region.

Rayalaseema- Groundnut

Yield – Period I: The estimated exponential equation for groundnut in Rayalaseema region is

$\hat{Y}$ = (171.8027) $(0.6360)^t$
(0.6111)
C.G.R= -36.406, C.V=18.24

In the above estimated exponential equation, the regression coefficient, i.e., the value of B is 0.6360. It reveals that the average annual growth over the previous years is 0.64. Therefore, the average annual growth in yield of groundnut crop is 0.64 percent. The compound growth rate of groundnut yield during the period I is –36.41. It expresses that the groundnut yield is decreasing. It reveals that the compound growth rate of groundnut yield during the period I is insignificant. The estimated coefficient of variation

is 18.24 percent. Which shows that 18.24 percent of variation in groundnut yield was recorded, during the period I in Rayalaseema region. Therefore, the instability in groundnut yield is 18.24 percent.

Yield-Period II: The computed non-linear equation of groundnut yield for the period II is

$$\hat{Y} = (233.3135) \quad (0.7351)^t$$
$$(0.1631)$$

C.G.R= -26.49, C.V=24.68

From the above equation, the regression coefficient, i.e., the value of 'B' is 0.7351. It expresses that the average annual increase over the previous years is 0.7351. Therefore, the average annual increase in yield of groundnut crop over the previous year is 0.74 percent. The compound growth rate of groundnut yield during the period II is –26.49. A negative growth in groundnut yield was recorded during the second period, but it is an insignificant decrease in growth. The C.V is 24.68. It shows that 24.68 percent of variation in groundnut yield was recorded during the period II in Rayalaseema region. So, the instability in groundnut is 24.68 percent.

Yield - Period III: The estimated equation of yield under groundnut crop in Rayalaseema region is

$$\hat{Y} = (443.1346) \quad (0.6070)^t$$
$$(0.4430)$$

C.G.R=-39.2993, C.V.=21.67.

In the above computed equation, the regression coefficient, i.e., the value of 'B' is 0.6070. It reveals that the average annual increase over the previous years is 0.61 percent. Therefore, the average annual growth rate of groundnut yield during the period III is -39.30. It reveals that the compound growth rate of groundnut yield during the period III is insignificant. The computed coefficient of variation in Rayalaseema region during the 3rd period is 21.67. It means that instability in groundnut yield is 21.67 percent.

Observing the estimates, in all the periods, i.e. I, II and III an insignificant growth was noticed. This is due to lack of new technology, high yielding verities and fertilizers. During the period I, i.e., pre-green revolution period, owing to usage of traditional methods in groundnut cultivation, non-availability of new technology, the groundnut yield may be decreasing. During the period II though, the new technology (TMO), high yielding varieties, fertilizers and pesticides were available, the groundnut growers are not able to invite the green revolution properly. The causes for failures in enhancing the groundnut yield during the above two periods may be reflect in the 3rd period. Finally, it is noticed, though the area and production of groundnut crop may be increased the yield may not be increased significantly.

COEFFICIENT OF VARIATION IN AREA, PRODUCTION AND YIELD OF GROUNDNUT CROP

Groundnut	Period I			Period II			Percentage Change Over Period-I (CV)	Period III		
	Mean	SD	CV	Mean	SD	CV		Mean	SD	CV
Area	7.77	1.77	22.803	14.06	1.83	13.00	-43.06	10.92	3.62	33.20
Production	6.82	1.60	23.48	11.58	3.67	31.70	35.81	9.20	3.70	40.19
Yield	0.008	0.001	18.24	0.008	0.002	24.68	35.31	0.008	0.002	21.67

Observing the table, the estimated coefficient of variation under groundnut area during the period I i.e., Pre-green revolution and green revolution period is 22.83 percent and during the period II, i.e., Post-green revolution and TMO period is 13.00 percent in Rayalaseema region of Andhra Pradesh. It is more in period I, than in the period II. Percentage Change of Coefficient of Variation over the period I is (-43.06) negative. This occurred due to improper utilization of new technology, and unfavourable weather conditions. In case of groundnut production, the estimated Coefficient of Variation is 23.48 percent during the first period and 31.70 during the second period i.e., Coefficient of Variation is more in period II, than in the period I. It means, percentage change of production in period II over the period one is recorded positively (35.81). The same trend was observed in case of yield under groundnut crop. It is 18.24 percent during the first period and 24.68 percent during the second period. The percentage change over period I is 35.31. It may be recorded because of lack of fertilizers, pesticides and lack of irrigation facilities.

References

1. Ashok Parikh and Pravin, Trivedi., "Impact of Irrigation and Fertilizers on the Growth of output in Andhra Pradesh", A Bayesian approach. Indian Journal of Agricultural Economics, Page No. 159-170
2. Archana Singh and Srivastava R.S.L., "Growth and Instability in Sugarcane production in Uttar Pradesh: A Regional study". Indian Journal of Agricultural Economics, Page No. 159-170
3. Jhala M.L; "Farmers response to economic incentives; An analysis of inter – regional Groundnut supply response in India", Indian Journal of Agricultural Economics, Vol:34, No:1, January – March 1979, Pp 55-57.
4. Mundinamani S.M, Sastry K.N.R, Murthy T.N.V; "Growth performance of Oilseeds in Karnataka", Agricultural Situation in India, 1995.
5. Palanisamy R; "An Economic analysis of groundnut net production", Agricultural Situation in India, Vol.52, No.8, 1955, Pp 533-538.
6. Research Notes, "Economic Performance of groundnut marketing channels. A case study of Rayalaseema Region of Andhra Pradesh", Indian Journal of Agricultural Economics.