CHAPTER VIII

Summary and Findings
The importance of agriculture in the economic development of any country is borne out by the fact that it is the primary sector of the economy which provides the basic ingredients necessary for the existence of mankind and also provides most of the raw materials which when transformed into finished products serve as basic necessities of the human race. In addition to supplying food, agriculture must provide many of the raw materials for industry. However, agriculture is not only a supplier of goods for domestic and export needs, but also a supplier of production factors such as capital and labour. The importance of agriculture in India can be judged mainly from its contribution to national income and employment. Agriculture continues to be a major source of income and employment to a vast majority of (about 65 per cent) People in India. The agricultural sector in India supplies food to the fast-growing population and raw material to the manufacturing industry. The agricultural sector with surplus labour is in a position to supply manpower required for the industrial sector in urban areas. The agricultural sector creates demand for industrial products with the advent of the Green revolution, there has been a considerable increase in farm incomes in areas with relatively better irrigation facilities.

The second phase of green revolution (1980) appears to be the best period for Indian agriculture with significant acceleration in output growth and reduction in regional inequalities because of the introduction of HYVs for other crops, spread of green revolution to eastern region and emphasis on water shed programs in dry areas. Since independence, considerable progress has been made in the sphere of agricultural development in the country in terms of increase in crop production and productivity, technological developments, and crop diversification.

Andhra Pradesh is an important agricultural state of the country. The state accounts for 8.34 per cent of the country’s geographical area, and for 7.37 per cent of the country’s population. Andhra Pradesh accounts for 7.42 per cent of the country’s net sown area and for 7.42 per cent of the country’s food-
grain production. A larger proportion of labour force depends on agriculture in the state (62.3 %) as compared with that at the all-India level (56.2%). Similarly, the share of agriculture in the state’s Gross Sate Domestic Product (28.6%) is higher than the corresponding figure all-India level (24.0%). In fact, the state was known as the granary of South India till recently. Sustainable growth in agriculture sector is the “need of the hour” not only for the state of Andhra Pradesh but also for the country as a whole. The state’s economy continues to be predominantly agrarian. The share of state’s rural labour force employed in agriculture (main workers only) was a high as 81 per cent in 1991. Nearly, 58.72 per cent of the agriculture workers are labourers.

Technology and technical process have enabled man to utilize the human and natural resources rapidly and effectively so as to generate new products, process and organization system of comfortable living. The adoption of new technology by farmers among other things shows an effect in income. The quicker and the greater the raise in income resulting from the use of new technology, the greater is the profitability of its being adopted by cultivators. The Technological break through in agriculture which witnessed the Nation during late sixties benefited the farming community to a considerable extent. Agricultural technology refers to the knowledge used in improved agricultural productivity. It points out to the input-mix and changes that occur in it from time to time with a view to enhancing productivity at the reduced cost. Agricultural technology may be reflected in a given mix of men and machines, seeds and fertilizers, animal labour and management inputs. Further technological knowledge refers to the knowledge of using a technology. The use of new technology warrants new knowledge among the use of new technology reformed technology may remain idle, if the knowledge to use it, has not been developed simultaneously and diffused among the farmers. Obviously, spread of education and extension services are essential to let farmers catch up with the changing technology.
The present study is presented in eight chapters. The first chapter deals with the nature and significance of agriculture, importance of agriculture to Indian economy, growth, performance of agriculture in the Post-Independent period, Technological changes in Indian agriculture, and role of commercial crops. Andhra Pradesh economic review, agriculture and allied activities in Andhra Pradesh, need of the study, design of the study, Review of literature was discussed in second chapter. Objectives and Methodology, Data which was used in the study, were presented in third chapter. The estimations of Linear and Compound growth rates, Instability in area, production and yield of two major commercial crops groundnut and sugarcane for pre and post-green revolution periods were studied in the fourth chapter. In fifth, sixth and seventh chapters, Technological changes of Area, Production and Yield responses of the two crops groundnut and sugarcane for both the periods Pre-green revolution period (1960-1971) and Post-green revolution period (1971-2001) were analyzed respectively. In the last chapter, summary and the findings of the study along with suggestions for improvement of the groundnut and sugarcane crops were given.

GROWTH AND INSTABILITY:

In a developing economy, the growth rates of agricultural products assumes a critical importance, due to a raising demand for them, generated by the rapidly growing population and accelerated for their by raising levels of income. This problem is based on the existing possibilities of agricultural sector as well as on the increasing flow of resources into agriculture. The forces of growth buildup at slower pace then the forces of demand, with the result that the instrument of price which motivates the farmer to act acquires on over riding importance provided that this instrument is effective, owing to raising demand for agricultural products due to raising population, it is necessary to study the growth and instability of agriculture in area, production and yield. With the help of estimates it is possible to take policy decisions to meet the feature demand of the country. In this connection the present research
presented to study the growth and performance of two major commercial crops groundnut and sugarcane in three regions of Andhra Pradesh. The growth and Instability of the selected crops were studied in two different periods, i.e., Pre-green and Post-green revolution. A brief review of growth and Instability of groundnut and sugarcane, region wise is given below.

**AREA — Growth and Instability:**

**Rayalaseema region:**

In case of groundnut area, an increasing trend was observed during the pre and post-green revolution periods. On average nearly five per cent and 2.8 per cent growth in groundnut area was recorded. This average annual increase in groundnut area was significant. This reveals that the technological effect on groundnut areas was observed in Rayalaseema region. It is also observed that the instability in groundnut area was 18 per cent and 25 per cent in two periods respectively.

The average annual increase in sugarcane area was significant during both periods. Nearly 4.7 per cent and 1.8 per cent growth was noticed. It reveals a positive trend on cane area. The instability as recorded 26 per cent and 16 per cent in two periods respectively.

**Coastal Andhra Region:**

Average annual increasing trend in groundnut area was observed during pre and post-green revolution periods. On average, nearly six per cent and 0.3 per cent of growth was recorded in groundnut areas. This average annual increase in groundnut area was significant. This reveals that technological effect on groundnut area was observed in Coastal Andhra Region. The instability in groundnut area was recorded nearly 20 per cent and three per cent both the periods respectively. Almost 97 per cent stability in groundnut area was recorded in second period.

In case of sugarcane area also a significant positive trend was noticed during pre and post-green revolution periods. Nearly, five and 2 per cent of
growth was recorded: It was also observed that the instability in sugarcane area was 22 per cent and 17 per cent in two periods respectively.

Telangana Region:

The average annual increase in groundnut area was significant in pre-green revolution period, but not significant in post-green revolution period. On average nearly 11 per cent growth was recorded and it is significant in pre-green revolution and 0.9 per cent growth in post-green revolution period. It is also observed that the instability in groundnut was nearly 37 per cent and seven per cent during both periods respectively.

The annual increase in sugarcane area was not significant, but it is positive during both the periods. Nearly 0.08 per cent and 0.5 per cent growth was recorded in both the periods. The instability in cane area was recorded 21 and five per cent during pre and post-green revolution periods.

Andhra Pradesh:

In case of groundnut crop a significant average annual increase in area was recorded during both the periods. On average more than six per cent and nearly two per cent of area growth was recorded in two periods. It reveals that the technological effect was not observed in Andhra Pradesh state. The instability in groundnut area was recorded 22 per cent and 17 per cent in the both the periods respectively.

The average annual increase in sugarcane was significant in both the periods. On average 4.6 and 1.5 per cent in area growth was recorded. It is also observed 24 per cent and 14 per cent instability in cane area during the both periods respectively.

PRODUCTION - Growth and Instability:

Rayalaseema Region:

In case of groundnut production, during both the periods, a significant positive growth was observed. This means on average 4.6 and 3.7 per cent of production growth was recorded in two periods. According to average increase, the technological effect was noticed in post-green revolution period. Almost 22
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per cent and 25 per cent of instability in groundnut production was recorded during both the periods respectively.

On average three per cent growth in sugarcane production was recorded in pre-green revolution period, but in post-green revolution, two per cent of growth in sugarcane production was recorded. Instability in production was 24 per cent and 18 per cent in both the periods respectively.

Coastal Andhra region:

In case of groundnut production, there was a significant increasing trend was recorded in both the periods. On average, five per cent and one per cent growth in production was recorded. The technological effect was absent in case of groundnut output. The instability in production was observed 18 per cent and 11 per cent in pre and post-green revolution periods respectively.

On average four and one per cent of production growth was recorded significantly in case of sugarcane during both the study periods. It is also observed that 19 per cent and 10 per cent of instability during the pre and post-green revolution periods respectively. The average annual increase in cane output was positive and significant.

Telangana Region:

In case of groundnut production an increasing trend was observed during both the periods. On average nearly 11 per cent and 1.6 per cent of production growth was observed in two periods respectively. It is also observed 43 per cent and 14 per cent of groundnut production instability in two periods respectively.

In case of sugarcane production growth, a negative and insignificant trend was observed. This means, on average 0.89 per cent and 0.37 per cent of production was decreasing annually. It reveals that there is no technological effect. Nearly, 22 per cent and three per cent of instability was recorded during both the periods respectively.
ANDHRA PRADESH:

In case of groundnut crop, a significant positive trend in production was observed during pre and post-green revolution periods. This means on average nearly seven per cent and two per cent of production growth was recorded. This reveals that the technological effect on production of groundnut was not recorded. Nearly 26 per cent and 20 per cent of instability was observed in the both periods respectively.

In case of sugarcane during both the periods production growth was observed, annually. On average two per cent and one per cent production growth was observed. It was also observed nearly 17 per cent and nine per cent of instability in pre and post-green revolution respectively.

YIELD - Growth and Instability:

Rayalaseema Region:

A negative trend was observed in case of ground yield during both the periods. It means, on average one per cent of yield was decreasing in both the periods. This reveals that the technological effect in groundnut yield was not observed. It also observed 12 per cent and one per cent of instability in yield during both the periods.

In case of sugarcane crop yield the trend was negative and significant in pre-green revolution and positive in post-green revolution period. This reveals that 1.25 per cent decreasing growth in yield was in pre-green revolution period and 0.18 per cent increasing growth was recorded during post green revolution period. Nearly six and two per cent of instability was observed both the periods of respectively.

Coastal Andhra Region:

In case of groundnut, a negative trend in the yield pre-green revolution period and a positive trend in post-green revolution period were recorded. Almost 0.74 per cent negative growth and one unit positive growth were recorded in two periods respectively. It is also observed nearly seven and nine per cent of instability during both the periods respectively.
Nearly 0.62 per cent and 0.71 per cent of negative yield growth was recorded in case of sugarcane during Pre and Post-green revolution periods. Nearly 6 per cent of instability was observed during pre and post-green revolution periods respectively.

**Telangana Region:**

A positive trend was noticed in groundnut yield during the study periods, but the trend is significant in post-green revolution period. On average, 0.20 and 0.92 per cent of growth in yield was recorded in both the periods. This reveals that technological effect was observed during the second period. Nearly 21 and eight per cent of instability was observed in both the periods respectively.

A negative and insignificant trend in groundnut yield was recorded during both the periods. On average 2.89 per cent and 0.89 per cent of negative growth was recorded. This means there was not any technological effect on groundnut yield. Nearly 25 per cent and eight per cent of instability was observed in both the periods.

**Andhra Pradesh:**

In case of groundnut yield during pre-green revolution period the trend was negative, but in post-green revolution period the trend was positive, but not significant in both the periods. An insignificant negative and positive trend in groundnut yield was noticed in the two study periods respectively. On average 0.23 per cent decreasing growth and 0.31 per cent increasing growth in pre and post-green revolution periods was recorded. It was also observed that nearly 13 per cent and three per cent of instability in productivity was recorded during both the periods respectively.

There is a negative and significant trend in sugarcane yield during pre-green revolution period and negative trend in cane yield was recorded in post-green revolution period. On average 1.49 and 0.57 per cent of negative yield growth was recorded in both the periods. Nearly, seven percent and five per cent of instability in yield was recorded in both the periods respectively.
AREA – PRODUCTION - YIELD RESPONSE:

The growth in area however has not been uniform or steady. There had been considerable fluctuation in both area and production that led to the fluctuation in yield. Fluctuation in area of crops was caused by variation in prices, weather conditions, availability of irrigation facilities and other inputs. It fact the area of individuals crops varying systematically in response price movements was widely accepted. An increase/decrease in area was net regarded as proxy for an increase/decrease in output of crop. Although such assumption had been valid, it was worthwhile to study the area response, production response and yield response of two major commercial crops in three region of Andhra Pradesh.

AREA RESPONSE:

Rayalaseema Region:

In case of groundnut the area was responded by price factor during pre-green revolution period. Growers are motivated by lagged price only. Where as price is not a motivating factor, but irrigated area and rainfall were motivating groundnut growers during post-green revolution period. It indicates that technological factors are motivating groundnut growers in enhancing the area.

In case of sugarcane, irrigated area and lagged yield were responsive to increase sugarcane area during period I. Over 99 per cent of variation was recorded by the selected variables, which is significant variation also. In period II, along with irrigation factors, the other factors are also influencing the cane growers in allocating the area to sugarcane. Only 72 per cent of significant variation was recorded by selected variables.

Coastal Andhra Region:

During pre-green revolution period, a significant variation (99 per cent) in groundnut area was recorded by selected variables. Yield risk, rainfall and lagged area’s effect was positively significant, but the effect on irrigated area was negative and significant. Insufficient or excess water/irrigation was adversely affecting. Price effect was very negligible (16 per cent). In post-
green revolution period, prices are not encouraging the growers. To encourage the growers in area allocation, attractive prices may be provided. The same result may be drawn from the rainfall, i.e. insufficient rainfall may also affect the groundnut negatively. Lagged area's effect is also positive and significant. It may be concluded, almost eight per cent of variation was decreased in period II over period I. Other factors are also influencing on area significantly in post-green revolution period.

A significant variation (99.4 per cent) in sugarcane area was recorded. The factors lagged area, price risk; yield risk and irrigated area were the major determinants of cane area in period I. Price effect was not observed in period II. Negative price effect was recorded, i.e. cane growers were not attracted by its price. By offering attractive prices of sugarcane it is possible to raise the cane area. Risk factors are not significant. Irrigated area's effect was significant. Remaining variables recorded their negative effect. It is noticed that technological effect is negative decreasing (17 per cent) the variation in cane area.

**Telangana Region:**

During pre-green revolution period, a significant variation (96 per cent) in groundnut area was recoded by the selected variables. Lagged yield, yield risk, irrigated area and lagged area's effect was positive but not significant, but the effect of lagged price, rainfall and price risk were negative and insignificant. Prices are not encouraging groundnut growers to enhance more area. During the post-green revolution, the price effect is negative i.e. price's of groundnut are not encouraging growers to allocate more areas. Irrigated area was positively influencing the groundnut growers to allocate more. The same result may be drawn from the lagged area variable. Lagged yield, yield risk variables were negatively associating with groundnut area. The variable rainfall is negative and significant i.e. insufficient rainfall may also affect the groundnut area negatively.
The factor irrigated area was the major determinant of cane area in period I. The variable rainfall is negative but significant. This means un-timely rainfall will reduce the sugarcane area. The price effect is positive, i.e. price of sugarcane was encouraging its growers to allocate more area to sugarcane. The variable lagged yield, price risk and lagged area are all not influencing on sugarcane area. During the post-green revolution, the significant variation (47 per cent) in sugarcane area was recoded by the selected variables. Prices of sugarcane were encouraging its growers to allocate more area. Water source i.e. irrigated area and rainfall together were positively encouraging sugarcane growers in this region. The variables lagged yield and lagged area were encouraging the growers positively and significantly to allocate the sugarcane area. The other variables are positively affecting the sugarcane area.

ANDHRA PRADESH:

During the period I, only price effect i.e. lagged price and price risk variable were positively encouraging groundnut growers to increase more area. Lagged yield, yield risk, irrigated area, rainfall and lagged area are showing their negative effect on sugarcane area. So, irrigation and rainfall are not influencing the growers to increase the area of groundnut. During the post-green revolution period, the variables irrigated area and lagged area was positively and significantly showing their effect on groundnut area. Price effect was also positive on groundnut area. The variable rainfall also gives the same effect as price variable. Other variables were negatively affecting on groundnut area. It may be concluded that almost 15 per cent of variation was decrease in period II over period I.

During pre-green revolution period, prices effect i.e. lagged price and price risk are the influencing factors on cane area. The effect of rainfall is negative and insignificant. Irrigated area is also influencing positively on sugarcane area. The other variables are positively influencing on sugarcane growers to allocate more in future also. A significant variation (48 per cent) was recorded by selected independent variables during Post-green revolution