CHAPTER 8

The Summary and Suggestions of the Study
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 people in India. The agriculture 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 growth performance of oilseeds was different during different phases of agricultural development viz. pre-green revolution period (1960-71) Green Revolution period (1971-82) and post-green revolution (1982-2003). During Phase-1 while the rate of Growth of oilseeds production was reasonably good. It was low during Phase-II, i.e. green revolution period. But fairly high in later period at Phase –III i.e. post green revolution period. Further, during the early phase much of the increase in production was recorded by the expansion of area, but in the later period i.e. in Phase-III. The increase in the yield of oil seeds has also contributed substantially in raising their production. It was also observed that, while the production performance has improved in some of the newly
introduced oilseed crops of Soyabean, Sunflower etc. Besides the traditional crops of rape seed and mustard no significant change in the productivity.

Though there is a significant increase in the production of oilseeds, this production is not enough to meet the requirement of Country. The Per-capita availability of vegetable oil in India is very less when compared to the World. The same trend is also observed in Andhra Pradesh. The Government will have to make efforts, to increase the production of oilseeds to meet the demand of the country. To take policy decision, there is need to estimate the growth rates and supply response of oil seed crops. Hence we select the five oil seed crops, namely, Groundnut, Castor, Sesamum, Coconut and Linseed in three regions of the state and the state of Andhra Pradesh, to analyze the supply responses.

There are number of studies on supply response of agricultural crop. These studies did not consider the effect of risk in price and yield. Here, an emphasis has been laid on risk factors along with the some selected factors. For present study four objectives are mainly formulated and this study is divided in to eight chapters. The growth rates of selected oil seed crops were estimated with the help of linear and exponential functions. The supply behaviour of oil seeds were studied by adopting Nerlove partial adjustment model. The short run and long run price elasticities are also estimated.

**Groundnut:**

From the estimated growth rate of Groundnut crop the growth in Groundnut area is positive in Rayalaseema region but the area growth is negative in Coastal Andhra and Telangana regions. In case of State of Andhra Pradesh, the growth in area is observed to be positive. Observing the growth rates of Groundnut production, it is positive in two regions in Rayalaseema and Telangana. But it is negative in Coastal Andhra region. The growth rate of Groundnut production is also positive. Observing the growth rate of
Groundnut yield, it is positive in Coastal Andhra and Telangana regions whereas the yield growth rate is negative in Rayalaseema. In entire state, the Groundnut yield rate is negative. Though the area and production of growth of Groundnut in Rayalaseema is positive yet the growth in Groundnut yield is negative. This is due to Groundnut growers in Rayalaseema are using the traditional varieties instead of HYV because lack of irrigational facilities and rain fall. But in case of Telangana and Coastal Andhra, the opposite trend was observed, i.e. the positive yield growth was recorded. This is due to better irrigation facilities in both the regions. In Andhra Pradesh State, negative growth rate in yield was observed. A maximum instability in Groundnut area was recorded in Coastal Andhra region. Where as the production instability is high in Rayalaseema region and the maximum instability in yield was recorded in Coastal Andhra.

**Castor:-**

A negative growth rate was recorded in Castor cropped area in all regions and the State except in Rayalaseema. The positive production growth rates of Castor crop in all regions except Coastal Andhra. The growth in Castor crop yield is positive in each regions and State. The instability in Castor area is maximum (81.84 percent) in Telangana region. The Castor production stability is high in Telangana region. Where as the more stability in Castor yield is noticed in Coastal Andhra.

**Sesamum:-**

A negative growth rate was recorded in area, production and yield of Sesamum crop in Coastal Andhra region. But an opposite trend was noticed in Telangana region. In Rayalaseema region, the growth rates of area and production is negative where as the growth in yield is positive. In Andhra Pradesh state as whole, though the growth in area is negative yet the production and yield rate is positive. This indicates the positive effect of new agricultural Technology. In more instability in Sesamum cropped area (49.56
percent) was recorded in Rayalaseema region and the highest instability (51.13 percent) in Sesamum production was observed in Telangana region. It is least in Telangana region. In case of Sesamum yield, a highest instability was recorded in Coastal Andhra region. In entire state of Andhra Pradesh, the stability in Sesamum yield is 76.39 percent.

**Coconut Crop:-**

The linear and compared growth rates of Coconut crop area, production and yield was observed to be positive in all regions of Andhra Pradesh and state as a whole. The highest instability (90.09 percent) in Coconut area was recorded in Telangana. The highest stability (43.44 percent) in Coconut production was noticed in Rayalaseema region. In case of Coconut yield, the highest instability was observed.

**Linseed:-**

Unfortunately it is observed that a negative growth was recorded in all aspects in each region and the state. 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 oil seed crops was caused by variation in prices, weather conditions, availability of irrigation facilities and other factors. In fact the area of individual crops varying systematically in response to price movements was widely accepted Phenomena. An increase/decrease in area was recorded as a proxy for an increase/decrease in crop output although such assumption had been valid, it is worthwhile to study the area response of oil seed crops in three regions of Andhra Pradesh. A brief conclusion of region wise supply response analysis of selected oil seed crops was given below.

**Coastal Andhra:-**

From equation (8) the aggregate effect of two variables lagged price and lagged area on Groundnut area was observed to be 88.56 percent. This effect is significant effect.
Particularly the lagged area effect on current area is observed to be positive and significant in case of Groundnut crop. A similar trend was recorded in case of Castor crop. Only 49.52 percent and 50.88 percent of variation by two selected variables, was observed in both linear and log-linear models respectively. In case of Sesamum crop, the collective effect of two independent variable is almost negligible. These two independent variables show independently, negative effect on current area. The combined effect of lagged price and lagged area on Coconut area is 99.15 percent and it is significant individually. Two exogenous variables (Pt-I&At-I) effect on endogenous variable (At) is positive and significant. In case of linseed crop the effect of Pt-I and At-I is negative and insignificant in linear model. In log-linear model, the lagged price (Pt-I) is negative and significant. It expresses that the Linseed area may be increased by providing minimum price support. The collective effect is significant in log linear model.

Observing the price elasticities of selected oilseed crops, a positive price elasticity is recorded only in case of Coconut crop. A negative elasticity was recorded in remaining crops.

From equation (11) the combined effect of all selected independent variables on Groundnut area is 97.66 percent and 97.94 percent in two models and it is found to be significant. The irrigated area and lagged area variables established a positive and significant relationship with Groundnut area where as a lagged yield and two risk variables established only a positive relation. A negative relation ship was noticed by time, rainfall and lagged price. A negative price effect reveals that the Groundnut growers are negative by responded by the Groundnut prices. A similar trend may be observed in case of Castor crop. All exogenous variables collectively influence the Castor area by 56.69 percent and 67.58 percent in both models. This effect is significant effect. A positive price effect was observed by all selected variables except price risk and lagged
area in case of Sesamum crop. The effect of price risk is negative and significant which indicates the area under Sesamum may be increased by reducing the price risk. Only 50.78 percent of variation was observed by selected variables and it is also significant (Linear model). Almost 99.77 percent of variation in Coconut area was recorded by selected explanatory variables and this variation is found to be significant variation. The effect of lagged area, irrigated area and lagged price is positive and significant. The effect of rainfall is negative but significant in case of linear model. A little positive price effect was noticed.

In case of linseed crop in log-linear model, the effect of lagged price, lagged yield, rainfall and yield risk is negative. But it is significant in case of lagged price. The effect of price risk, time and lagged area is positive but the effect of price risk is significant. Nearly 68 percent of variation in Linseed area was noticed by all variables. Finally, it is inferred that the lagged area and irrigated area effect was observed. But a negative lagged price effect was noticed.

Rayalaseema:-

The co-efficients of lagged price (Pt-1) and lagged area (At-1) area positive and significant. It means that there is positive price response in allocating the area under Groundnut crop in Rayalaseema region. Hence, the present study reveals that in Rayalaseema region, Groundnut crop is price responsive.

In the present study, the Castor cropped area is positively responded by lagged price and lagged area. It shows that castor area allocation is influenced by market price of castor. The marketing prices are encouraging the castor crop growers in Rayalaseema.

In case of Sesamum crop in Rayalaseema region, the lagged price (Pt-1) coefficient is negative and significant. It reveals the fact that the price is not encouraging the farmers. But there is some scope to raise the area under the Castor crop by giving
some price incentives or by providing better market facilities. With respect to the Coconut crop in Rayalaseema, the current area under the crop is influenced by lagged price (Pt-1) and lagged area (At-1). Hence, these two variables have significant effect. From the results, it is observed that the Coconut crop is responded by lagged price and lagged area under the study.

The estimated results of linseed crop in Rayalaseema region, a negative price relationship with the area under the linseed crop was noticed. Since the lagged price (Pt-1) coefficient is negative and not significant. It reveals the fact that the prices are not encouraging the farmers.

Short-run and long-run price elasticities of Groundnut and Coconut of Rayalaseema region are positive. It means the Groundnut and Coconut crops are price responsive. The farmers are more responsive to price changes in the case of Groundnut and Coconut crop under study area. In case of Sesamum and Linseed crops, price elasticities in Rayalaseema region are negative. It means the Sesamum and Linseed crop in this region are not price responsive crops. In case of Castor crop, it is price responsive in linear model. The Coconut crop farmers have taken a long time to adjust area under the Coconut crop in Rayalaseema region.

In Rayalaseema region, the effect of irrigated area and price risk is positive and significant. Groundnut area is neither price responsive nor area responsive. It is responded by irrigated area and price risk. More than 75 percent of variation in Groundnut area was observed in Rayalaseema region.

In case of Castor crop, the area is responded by lagged area. An insignificant negative price response was noticed. Hence, the Castor growers are not responded with Castor prices. Irrigation factor shows a significant positive effect in allocating area. Almost 55 percent of variation in Castor area was noticed.
More than 86 percent and 96 percent of variation in Sesamum area was noticed by selected independent variables. This variation is found to be significant. The irrigated factor effect on cropped area is positive and significant. Similarly, the time factor shows a significant negative effect. The price responsive was not seen on Sesamum area. The two risk factors effect is positive. So the Sesamum crop is responded by irrigative area but not lagged area.

The Coconut cropped area was positively responded by all selected variables except rainfall and lagged yield. These two variables effect is negative. The effect of variables, yield risk and irrigative area is significant. More than 98 percent of variation in Coconut area was recorded by selected independent variables. Finally, it is concluded that the Coconut area is irrigative responsive as well as positive prices responsive.

Incase of Linseed crop, no estimated regression coefficient value is significant. The aggregate effect on linseed area is not significant and it is very low. It is inferred that the Linseed area is not responded by lagged price. It may also conclude that the cropped area is not influenced by any selected variables in Rayalaseema region.

**Telangana:-**

The study of the Groundnut crop in Telangana reveals that there is negative price response and positive lagged area response (At-1) on Groundnut area. It shows that Groundnut area allocation is not influenced by marketing prices of Groundnut. The marketing prices are not encouraging the Groundnut growers in Telangana region. It is concluded that the area allocation is purely depending on lagged area (At-1) and some other factors other than the price factors. It may be inferred that the area under the Groundnut crop may be increased by raising the farm harvest prices or price incentives to growers by the Government.
The results of castor crop indicate that there is negative price response and positive lagged area response (At-1) on area. It shows that castor area allocation is not influenced by marketing prices of Castor. It is noticed that the prevailing market prices are not motivating the castor growers to raise the area under castor crop. Hence, Castor crop is not price responsive in Telangana region.

A negligible price effect was noticed on Sesamum area and a significant lagged area effect was recorded on Sesamum area in Telangana region. Hence, sesameum area is not responded by the price i.e. market, prices are not encouraging growers.

From the discussion of Coconut crop of Telangana, the current area under Coconut crop is positively and significantly influenced by its lagged area. A negligible price effect was recorded on allocation of area to Coconut crop. Hence, it may be inferred that the Coconut area is not price responsive where as it is responded by lagged area.

The Linseed crop of Telangana region revels that the lagged price (Pt-1) and lagged area (At-1) are not influencing the Linseed area in Telangana region. A negative price effect was recorded by Linseed area in Telangana region.

The short-run and long-run elasticities of oilseed in Telangana reveals that the Groundnut, Castor and Linseed crops are non-price responsive. The Sesamum crop short run and long run price elasticities are negative in linear model but positive in log linear model.

The Coconut is the only price responsive crop in Telangana. But the Coconut growers are taking more years of time to adjust area under the Coconut crop with the price fluctuations.

It is also notable observation that the coefficient of adjustment value of Groundnut crop in linear model is 1.1291. It reveals that the Telangana Groundnut growers area in over adjustment of area under the crop with the price fluctuations. The coefficient of
The adjustment of linseed crop is negative in both the models. If the coefficient of adjustment is less than zero it can be said that the response is negative.

The lagged price ($P_{t-1}$) of Groundnut crop in Telangana is shown a significant negative effect in allocation of area. Irrigated area and lagged area ($A_{t-1}$) show significant effect. It means the Groundnut crop is not price responsive. It is mainly irrigated area and lagged area responsive crop. A significant negative price effect reveals the fact that there is some scope to raise the Groundnut area in Telangana by raising the market prices. It is also possible by providing minimum supporting price to Groundnut growers. From the estimated coefficient of price risk, it is found that there is significant positive relation between the price risk and current area. From coefficient of yield risk opposite trend was observed i.e as the Groundnut area increases, the yield risk may be decreased. The time factor may not shown any significant effect on cropped area.

The Castor crop in Telangana, the lagged yield ($Y_{t-1}$) and rainfall ($R_f$) are positive and significant. These values show positive effect on current area ($A_t$). The irrigation area also show positive effect on current area. So, the Castor crop in Telangana region is irrigative responsive crop. The lagged area ($A_{t-1}$) and lagged price ($P_{t-1}$) are not show any effect on castor crop in Telangana region. The two risk factors and trend value established a negative relationship with the Castor area.

The Analysis of Sesamum crop explains that the lagged price ($P_{t-1}$) is not shown any significant effect on area allocation. The lagged yield ($Y_{t-1}$) and price factors also not effective, the lagged area shows positive effect on current area up to some extent. Hence, the performance of Sesamum in Telangana region is not satisfactory.

The results of Coconut in Telangana region reveals that the area under the Coconut crop is responsive to lagged area but not the price responsive. The price responsive is not effective on current area. The irrigation factor shows significant effect in
allocating area under the crop. It reveals that the Coconut crop is responsive to irrigation facilities. The time factor influences the area positively.

The analysis of Linseed crop in Telangana explains that no independent value shows significant effect on current area separately. All these independent variables show 20.56 percent and 45.84 percent of variation in area in both models. But it is significant in linear model only.

**Andhra Pradesh:**

The result of Groundnut crop in Andhra Pradesh State reveals that there is a significant positive lagged area response on current area. It shows that Groundnut crop is area responsive. It is concluded that area allocation is purely depending on lagged area (At-1) and some other factors other than the price factor.

The Castor crop in Andhra Pradesh results indicates that the price response on Castor cropped area is negative and not significant. It implies that price movements are not influencing the Castor growers at significant level either positively or negatively. The lagged area response under the Castor crop is positive. But this response is not significant. It implies that the current area under the crop is not effecting by lagged area under the crop. It may be concluded that the Castor cultivation in Andhra Pradesh is negligible.

The estimated results of Sesamum crop in Andhra Pradesh State show that the Sesamum crop area (At) is neither price responsive nor area responsive. It reveals the fact that the lagged price or lagged area is not encouraging the farmers of Sesamum crop in Andhra Pradesh State. To encourage and protect Sesamum crop farmers in Andhra Pradesh State the Government must provide some price incentives or by providing better marketing facilities. From the above discussion, it is inferred that the Sesamum crop is going to decline in Andhra Pradesh State.
The estimated results of Coconut crop in Andhra Pradesh State reveals that this crop is area responsive. The lagged area is influencing the farmers in area allocation to the Coconut crop. The coefficient of lagged price is positive but not significant.

The study of linseed crop reveals that there is negative price response and positive lagged area (At-1) response on area. It show that linseed area allocation is not influenced by marketing prices of linseed. The marketing prices are not encouraging the linseed crop growers in Andhra Pradesh State. It is concluded that the area allocation purely depending on lagged area (At-1) and some other factors than the price factor. A significant negative price effect reveals that there is possibility to raise the linseed area up to some extent by increasing the prices.

From the result analysis of Groundnut, Castor, Sesamum, Coconut and Linseed crops of Andhra Pradesh, the short-run and long-run price elasticities of Castor and Linseed crops are negative. These crops are not price responsive in area allocation. It indicates that the farmers are not more responsive to price changes under the study.

The short-run and long-run price elasticities of Coconut crop are positive. It means there is price response in area allocation for the Coconut crop. The Coconut farmers have taken a long time to adjust with the changes in the prices of Coconut in area allocation because Coconut is a perennial crop. The short-run and long-run price elasticities of Groundnut crop and Sesamum crop are negative in linear model. These crops are not price response.

The estimated results of Groundnut crop in Andhra Pradesh state reveals that the area under the groundnut crop is responsive to lagged area. The price response is negative but not significant. The farmers in Andhra Pradesh state are not response to prices of groundnut crop. The irrigation factor shows significant effect in allocating area under the crop. It reveals that the groundnut crop is responsive to irrigation facilities. The rainfall
co-efficient showed a positive and significant effect on the allocation of the current area. It may be inferred that the groundnut crop is mainly a rainfall crop. The effect of yield risk factor is negative and significant. It reveals that as a risk in yield is increased area under the groundnut crop is decreased significantly. It is inferred that they are reducing the yield risk; it is possible to increase the groundnut area in Andhra Pradesh state. The current area under the crop is positive and significantly affected by lagged area under the crop. It may be concluded that the groundnut crop in Andhra Pradesh state is responded by mainly the two water sources - irrigation and rainfall. By observing the trend value, the groundnut area is increasing.

The analysis of Castor crop of Andhra Pradesh explains that this crop is neither price responsive nor area responsive. Irrigation and Rainfall show significant effect on Castor crop current area. It means the Castor crop of Andhra Pradesh mainly Irrigated area responsive crop.

In Andhra Pradesh the Sesamum crop is neither area responsive nor price responsive. It is yield responsive and irrigative responsive also. So there is some scope to raise area under the crop by providing irrigation facilities and providing High yield varieties to the farmers of Sesamum crop. The market prices and lagged area are not encouraging the farmers to allocate more area under the Sesamum crop.

The study of Coconut crop reveals that there is negative price response and positive lagged area response (At-1) on area. It shows that Coconut area allocation is not influenced by market prices of Coconut. The market prices are not encouraging the Coconut crop growers in Andhra Pradesh. The irrigation factor also shows significant effect in allocating area under the Coconut crop. It reveals that the Coconut crop is responsive to irrigation facilities. The lagged yield (Yt-1) factor also shows positive effect on area. It reveals that an increase in lagged yield will increase the current area
significantly. The price risk factor shows negative effect. As the price risk increases, the area under the Coconut crop may be increased. The risk factor of yield also shows some significant effect on area allocation.

The Analysis of Linseed crop explains that the lagged price is \((Pt-1)\) not showing any significant effect on area allocation. The lagged yield variable is influencing negatively. It is found that current area under the Linseed crop is affected significantly by lagged area. The Linseed crop in Andhra Pradesh state is not price responsive. It is responsive to lagged area \((At-1)\).