

CHAPTER-V

SUMMARY AND CONCLUSION

Among all the oilseed crops, groundnut is widely cultivated and is most predominant in the states of Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu and Rajasthan. In fact, Gujarat plays a pivotal role in oilseed production in the country. Among the oilseeds, groundnut is the most important crop produced in the Gujarat state. Gujarat is the single largest and the best quality groundnut producer in the country. It accounts for over 40 per cent of total groundnut produced in the nation. The area and production of groundnut in the Gujarat state constitute about 30.9 per cent and 37.1 per cent, respectively in India in the year 2015-16. It is pertinent that the farmers experience many farm level constraints in groundnut cultivation. The most significant constraints experienced by farmers include inadequate availability of fertilizers, problem of irrigation, presence of aflatoxin content in seed and non-availability of quality seed from government agencies on time. The inadequate availability as well as high price of groundnut seed from private agencies was also reported to be a major constraint.

Now, with the changes realized in the macroeconomic policies of India and due to liberalization of trade policy in the world, competitiveness has to be given more importance in agriculture. Henceforth, it is important to emphasize on efficient use of scarce resources which have alternative uses. Under these circumstances, reducing the inefficiency is the best option to enhance productivity. The identification of factors responsible for enhancing groundnut productivity should be given considerable attention. Keeping all these in view, a study on “Groundnut Production Dynamics during Pre and Post-Liberalization Eras: A case of Gujarat” was undertaken with the following objectives.

1. To project structural changes in the growth dimensions (i.e. area, production and productivity) of groundnut crop in the state of Gujarat during pre and post-liberalization eras.
2. To analyze the cost structure dynamics and the corresponding levels of FHP and MSP of groundnut crop.

3. To examine the trends in the profitability and income measures of groundnut crop.
4. To estimate and compare resource use efficiency of groundnut cultivation.

The study used secondary data to measure the trend in groundnut in terms of area, production, productivity, cost of cultivation, FHP, MSP, profitability and income measures while instability in terms of area, production and productivity and resource use efficiency in groundnut in Gujarat for 36 years, from 1980-81 to 2015-16, which in turn splitted in to three periods viz. Pre-Liberalization Period (1980-81 to 1991-92), Post-Liberalization Period (1992-93 to 2015-16) and Overall Period (1980-81 to 2015-16). The Post-Liberalization Period was again split into two periods as Post-Liberalization Period-I and Post-Liberalization Period-II so as to equalize the Overall Period into equal splits of 12 years to capture the recent implications. The data were collected from various reports of the Cost of Cultivation of Principal Crops (CCPC) project of the Department of Agricultural Economics, Junagadh Agricultural University, Junagadh and the various reports and publications of the Commission for Agricultural Costs and Prices (CACP), Ministry of Agriculture and Farmers' Welfare (MoAFW), Government of India.

Regarding the analytical tools, percentage analysis to measure per cent change; linear growth rate by using regression; compound growth rate by using logarithmic function were applied to identify the trends in growth dimensions. Hazell's decomposition analysis was carried out to know the instability in production. Fourier analysis was carried out to find out the cyclical variations. Cobb-Douglas production function was used to find out the functional relationship between input and output. Ratio of MVP to factor price was used to find out the efficiency ratio or the resource use efficiency.

The growth dimensions have been estimated for groundnut crop in terms of area, production, productivity, FHP, MSP, cost of cultivation, profitability and income measures. It was observed that the growth fluctuations in Overall Period were found to be greater than Pre-Liberalization and Post-Liberalization Periods. In terms of percentage change, productivity (135.35 %) noticed highest per cent change during Overall Period while the area (7.44 %) had lowest per cent change during Post-Liberalization Period-I. The maximum variation was observed in production (59.15 %) during Overall Period. The maximum linear (38.19 % / annum) and compound growth rate (3.85 % / annum) was observed in yield during Post-Liberalization Period

and results were statistically significant. The area noticed minimum negative linear (- 0.01 % / annum) and compound growth rate (- 0.56 % / annum) during Post-Liberalization Period-I. The results revealed that the rise in production was mainly due to increase in productivity. Hence it is important to focus on yield raising but cost reducing technologies through the increased use of agro advisory services and provision of institutional support to farmers.

Fourier analysis was carried out to find out the cyclical variations in area, production, productivity and farm harvest prices of groundnut. In fourier analysis among the 8 cycles the K value of 2.1459 of 3 year cycle of groundnut production and K value of 6.3092 of 10 year cycle of groundnut productivity were accepted which indicated that the 3 years and 10 years time series data were to be used for obtaining reliable and accurate farm plans under different types of risk. While the fourier coefficients of 8 cycles for groundnut area and farm harvest prices were rejected as none of the K values were found to be significant.

The results of Hazell's decomposition analysis showed that yield variance was the main contributor to the production variance in both Period I (91.28%) and Period II (74.50 %). As per the sources and components of change in variance of production of groundnut are concerned the results showed that the change in mean production of groundnut was mainly due to the changes in yield variance. Thus, it is concluded that the future development programmes should envisage on stabilization of yield for bringing stabilization in production of the crop.

The maximum change of 581.73 per cent and variation of 100.26 per cent was observed in hired human labour which indicated that more hired human labour were employed for cultivation of groundnut crop during Post-Liberalization Period. The highest compound growth rate was found to be in family labour (10.92 % / annum) which indicated that the compounded growth in family labour was more, stable and significant as compared to hired human labour (10.55 % / annum) and bullock labour (8.50 % / annum) during Overall Period. The lowest trend was found in bullock labour (0.93 % / annum) during Pre-Liberalization Period. Thus, results revealed that the growth in value of labours during Pre-Liberalization Period was less as compared to Post-Liberalization Period. The difference in mean value of bullock labour expenses during Pre and Post-Liberalization Period was less as compared to manual labour. It is due to reduction in use of bullock labour in groundnut cultivation and it was replaced by cheap machine labour.

The results showed that the highest variation was observed for irrigation (124.5 %) followed by pesticides, manures and fertilizers during Overall Period of study. This may be due to the reason that availability and use of irrigation is affected by monsoon while the use of pesticides depends on incidence of pest and diseases. Therefore, the use of irrigation and pesticides varied more as compared to use of manures and fertilizers. The results indicated that the growth rates for inputs of agriculture were statistically significant at 1 per cent. The lowest linear (8.0 % / annum) and compound growth rates (2.7 % / annum) were observed in fertilizers during Pre-Liberalization Period.

The gross returns (3054.99 %) noticed highest per cent change while the per cent change in total cost (Cost-C) was observed to be 2064.72 per cent which revealed that increase in gross return was similar to increase in cost of cultivation because the per cent change in gross returns and total cost are almost nearer and only a minor difference is observed in value. The results indicated that increase in gross return was not benefitted the farmers because due to similar increase in cost of cultivation of the crop during Overall Period of study.

The results showed that the highest variation was observed in gross returns (94.1 %) as followed by Cost C (31.6 %), Cost A and Cost B during Overall Period which indicated that the higher gross returns were obtained in higher due to higher price for the produce in the market which had better yield. The results showed that highest per cent change was observed in MSP (1856.31 %) as compared to FHP (45.44 %). The results also revealed that the highest compound growth rate was observed in both MSP (11.62 % / annum) and FHP (9.40 % / annum) during Post-Liberalization-II which indicated more rapid increase in FHP and MSP during the recent years.

The results showed that the highest per cent change was observed in family labour income (1864.83 %) followed by in net income (501.02 %) during Overall Period which indicated that higher profits were obtained to the farmers who employed more number of family labours in cultivation of groundnut crop. The results also revealed that highest variation (80.38 %) and compound growth rate (52.58 % / annum) were observed for net income during Post-Liberalization Period-II in comparison to other income measures.

So far as per hectare costs and returns are concerned, the highest gross returns of Rs. 37129.95 per hectare were obtained in groundnut production benefit cost ratio (1.87) of greater than one which indicated that the profitability of the crop during Post-Liberalization Period. The costs and returns obtained during Overall Period of study were found to have a gross returns of Rs. 18859.86 per hectare and total cost of Rs. 10516.10 per hectare with benefit cost ratio of 1.79 which was found to be greater than one. In comparison to both the periods the returns obtained were found to be greater during Post-Liberalization as compared to Overall Period. With regard to sensitivity analysis it is concluded that the groundnut farmers would likely be more affected by output price and cost of labour which can be compensated by increasing yield.

The Cobb-Douglas production function was fitted to find out the resource use efficiency of groundnut cultivation in Gujarat state during Post-Liberalization and Overall Period. The best model was identified using stepwise regression and backward elimination method. During Post-Liberalization Period following model was selected as the best model based on value of high adjusted R^2 of 0.934 and since many variables were found to be significant. In this four variables X_1 , X_2 , X_6 and X_7 were found to be significant.

Selected model $Y=5627.776+0.543X_1^{}+0.600X_2^{**}-0.319X_6^{**}+0.148X_7^{**}$**

During Overall Period following model was selected as the best model based on value of high adjusted R^2 of 0.960 and since more number of variables were found to be significant. In this four variables X_1 , X_2 , X_4 and X_8 were found to be significant. During Overall Period the sixth model was selected as the best model. The results were found to be significant.

Selected model $Y= 2897.6581+0.516X_1^{*}+0.489X_2^{*}+0.157X_3-0.301X_4^{*}+0.126X_8^{}$**

The contribution of regressors towards per cent change in returns per unit area during Post-Liberalization Period indicated that that manures had a inverse relationship with - 0.319 per cent reduction in net returns for every one per cent increase in increment in manures. During Overall Period the seeds had a inverse relationship with - 0.301 per cent reduction in net returns for every one per cent increment in seeds.

During Post-Liberalization Period the results of MVP showed that MVP and efficiency ratio of family labour, hired human labour, manures and plant protection chemicals were found to be greater than one which indicated that the above resources were found to be underutilized and viceversa. Thus, it is concluded that the resources like bullock labour, seeds, chemical fertilizers, irrigation and other expenses were overutilized and thus there is scope to decrease the use of all these resources to maximize the gross returns.

During Overall Period the MVP and efficiency ratio for family labour, hired human labour, bullock labour, seeds and irrigation were found to be greater than one which indicated that the above resources were underutilized. That means the sample farmers used more inputs than the optimal. Thus it is to be concluded that the resources chemical fertilizers, manures, plant protection chemicals and other expenses were found to be negative and overutilized. Thus maximum resources were found to be underutilized which indicated that there is scope for the farmer to increase the use of these resources to maximize gross returns.

Policy Implications

The important policy implications emerged from the study are as follows,

- (1) The growth rates of area and production were negative and significant in Gujarat state during the study period. The growth rates in groundnut productivity was found positive during overall study period which indicated that there is need to improve its production by developing production technology and suitable improved varieties.
- (2) Area under groundnut should be stabilized through crop insurance scheme to protect the producers from fluctuations in net returns.
- (3) Factors of production including family labour, hired human labour, seeds and plant protection chemicals were found to be underutilized during Post-Liberalization Period whereas the resources like family labour, hired human labour, bullock labour, seeds and irrigation were found to be underutilized during Overall Period of study. This suggests that the farmers need to divert more funds towards these underutilized resources. To address this issue, on-farm demonstrations (OFD) focusing on efficient resource utilizations, need to be carried out on farmers' field.

- (4) Efforts are to be made to optimize the input use application through the adoption of recommended dose of input levels by educating the farmers through targeted extension trainings.