CHAPTER – VII

SUMMARY AND FINDINGS

Never before in human history has the need been greater for better management of agricultural systems. In order to achieve such an aim it is absolutely necessary to have up-to-date information regarding present crop diversification. A basic element of cropping system of any region, is the yearly sequence and spatial arrangement of crops and fallow on a given area. But, crop diversification of a region plays a vital role in determining the level of agricultural production and reflects the agricultural development of that area. The interplay of complex social, economic and physical factors is responsible for crop diversification.

A crop diversification implies a change in the proportions of area under different crops, which depends to a large extent on the resources available to raise crops in the given agro-climatic conditions. Since time immemorial due to the good soil health and plentiful water availability, Tamil Nadu farmers have a set of crop cultivation in command areas, river areas, tank-fed areas and well irrigated areas, which are predominantly for Paddy, Sugarcane, Pulses and Ground nut.

Due to the changing rainfall pattern over the years, ground water depletion, lack of flows in the perennial rivers, scarcity of labourers and hike in wages, the existing crop diversification also ceased to be economically viable. Considering the scarce availability of water, it is time now to reduce the area under Paddy, Sugarcane and Banana in order to accommodate other less water intensive crops like Coconut, Oilseeds, Pulses, including Soyabeans to cover more area. The state has also experienced drought both during Southwest and Northeast monsoon seasons consecutively for the past three years from 2010 to till date.
This was compounded by lack of flows in rivers due to various reasons as it is a lower riparian district. The existing traditional crop diversification may not be viable in the coming years because of continuous ground water depletion, the deterioration in soil health, change in rainfall pattern, high cost of cultivation, lack of river water flows, implications of WTO etc. Hence, it is the time to go for crop diversification based on the agro-climatic zone. This must be demonstrated in the farmer’s holdings by a massive research cum extension in order to effectively utilize the natural resources and also to stabilize productivity and profitability.

The objectives of the study are (i) To highlight socio-economic background of farmers in the study area, (ii) To throw light on this structure land holding, yield and income of the farmers, (iii) To explore the determinants of crop diversification, (iv) To identify the constrains faced by the farmers in crop diversification in the study area.

The investigator examined following two hypotheses

1. There is a positive relationship among all the constrains experienced by each categories of farmers.

2. Monsoon failure and climate changes are the major constrains faced by the farmers.

The study was based upon a sample survey conducted in three blocks namely Ottapidaram, Vilathikulam and Kayathar of Thoothukudi District in the State of Tamil Nadu. A sample size 600 farmers were chosen by stratified random sampling. In each block, 200 farmers were selected at random in the study area.
The primary data were collected from sample respondents by administrating schedule. Secondary data were collected from the official records.

Statistical tool like Averages, Percentages, Spearman’s Rank Correlation and Scaling Techniques were used the period of the study was one year from January 2013 to December 2013.

7.1 MAJOR FINDINGS OF THE STUDY

The following are the major findings of the study:

- In study area, of all the three blocks the sample households of the maximum farmers are in the age group of 30 – 40.

- 64 small farmers in Ottapidaram block are literate. Most of them have studied up to higher secondary level.

- 69 small farmers are educated in Villathikulam block and other farmers are also educated.

- From Kayatar block most of the farmers have studied up to higher secondary level. Very few farmers have collegiate education. Thus, it is inferred that since the most sample respondents are educated they follow crop diversification.

- In the sample households of the average size of family in the study area of all the three blocks the large samples have 2 to 4 and 4 to 6.

- In Ottapidaram block, the higher yield of paddy is available to the medium farmers and the lowest yield to the large farmers. Similarly, in the case of
sugarcane the maximum yield is available to the medium farmers and lowest is to the large farmers.

➢ In Villathikulam block, due to the surface irrigation, paddy cultivation is carried out throughout the region. In addition to paddy cultivation groundnut is also popular in the region.

➢ In Kayatar block, the yields from all crops in the study area are more beneficial to medium farmers. The less beneficial segment varies from crop to crop and also from block to block.

➢ The gross income per acre from all the crops is very meager for all categories of farmers of the study area.

➢ As far as cost cultivation of crops in the study area is concerned, there is only a minor variation in all the three blocks. There is no significant variation regarding cost cultivation. Except paddy cultivation all the other crops are remunerative. So they want to change the year cropping pattern.

➢ In Ottapidaram block, the average net income of paddy is Rs. 6548/- per acre with lowest income for the large farmers and the highest for the marginal farmers. The average income for sugarcane is Rs.45502/- with lowest income for the large farmers and highest for the marginal farmers.

➢ In Villathikulam block, the average net income of paddy crop per acre is Rs. 6561/- with a maximum of Rs. 7302/- for marginal farmers and a minimum of Rs. 5336/- for large farmers. The average net income in the case of sugarcane is Rs. 45462/-.
The average net income per acre in Kayatar block is Rs. 6443/- in paddy cultivation. In this block, the marginal farmers have maximum net income of Rs. 7961/- per acre.

The farmers in the study area took up coconut cultivation due to crop diversification change. The average net income from coconut per acre is higher than paddy, groundnut and blackgram. Though the average income from sugarcane is higher than crops the farmers cannot always remain in sugarcane cultivation. The reason is due to the change in price policy of the Government and unsuitability of continuous cultivation of sugarcane.

The crop diversification changes because of some other reasons like lack of river water flow, change in rainfall, soil health and so on.

The problems or constraints faced by the marginal and small farmers in Ottapidaram block are ranked in the descending order of importance. It is seen that 89 percent of the respondents are facing problems related to changes of crop diversification, which occupies first rank. The next order of ranking shows the problems associated with change in climate with 88 percent of the marginal and small farmers. The constraints ranked next was the problems associated with monsoon failure expressed by 86 percent of the respondents. The fourth rank goes to the issues connected with lack of insufficient water with 84 percent.

The problems faced by the medium farmers in the study area are ranked at the time of interview. 87 percent of the farmers faced the problem of monsoon failure which accounts first rank. It is observed that 85 percent of the farmers faced change in climate problem holds second rank. The next rank shows 83
percent of the farmers associated with the problems of insufficient water holds third rank. Change of crop diversification with 81 percent occupying fourth rank.

- The problems or constraints faced by the large farmers in the study area are ranked. It is seen that 98 percent of the respondents are facing problems in dealing with monsoon failure and it holds first rank. The next order of ranking shows the problems associated with changes of crop diversification. The insufficient water with 96 percent get the fourth order ranking and shows the poor availability of labour problems.

- The problems or constraints faced by all the farmers in the study area are ranked in descending order of importance. It is seen that 91 percent of the respondents are facing problems related to change in climate. This occupies the first rank. The next order of rank shows the problems associated with monsoon failure met by 89 percent of the farmers are insufficient water with 87 percent and changes of crop diversification facilities with 76 percent hold third and fourth rank.

- It is observed in the study area that Ottapidaram, Vilathikulam and Kayatar in Thoothukudi District have black soil wherein, crop diversification mainly takes place. The reason is black soil is suitable for crop rotation.

- The average yield per acre in Villathikulam block for paddy in 16.93 percent which is the lowest yield to the farmers comparing to coconut and sugarcane. Both are constituting 40.14 percent and 36.86 percent respectively. So, it is evidently proved that even though paddy is a dominant crop in this block the
farmers have shifted to cultivated coconut and sugarcane as it is more remunerative.

- In Ottapidaram block, the average yield per acre in quintals for coconut and sugarcane are 39.79 percent and 36.82 respectively. Paddy constitutes only 17.00 percent. Owing to monsoon failure, change in climate water shortage, non-availability of labour compelled the presents to shift from paddy to coconut and sugarcane.

- As far as Kayatar block is concerned, the average yield per acre in quintals for paddy is 16.94 percent in comparison to coconut and sugarcane it is very low. Both coconut and sugarcane constitute 39.95 percent and 36.90 percent. Therefore, paddy cultivation is not gainful to the farmers in the study area.

- It is observed that in Ottapidaram block, the cost of cultivation per acre for paddy in Rs. 10959. But, for blackgram and groundnut require the minimum cost only. Both crops in-cure the cost of Rs. 5908 and Rs. 7065 only. It is not only economical but also more remunerative to the farmers.

- In Villathikulam block, the average cost of cultivation per acre for blackgram is Rs. 5881 and the groundnut perceeds the next accounts Rs. 6970 where as the cost of paddy peer acre is high amounting to Rs. 10959. This motivates the farmers to go for diversification from cultivating paddy.

- The farmers of Kayatar block income more cost for cultivating paddy which accounts Rs. 11001 while the cost of blackgram and groundnut are only Rs. 5930 and Rs. 6087 respectively. Therefore, the farmers of Kayatar are
showing more interest for cultivating their crops as it involves less cost and more remunerative.

- In Ottapidaram block, the average gross profit for paddy per acre is only Rs. 6548 which is the lowest income for the farmers. Whereas, the average gross profit earned from diversified crops namely sugarcane, coconut, groundnut and blackgram are Rs. 45502, Rs. 28037, Rs. 22249 and Rs. 13301 respectively. It is due to crop diversification.

- Similarly in the case of Villathikumal block, the average gross profit for paddy per acre is meager Rs. 6561. But, the average gross profit gained from other diversified crops namely, sugarcane, coconut, groundnut and blackgram are Rs. 45462, Rs. 29343, Rs. 23106 and Rs. 13707 respectively. It is inferred that, the traditional crop paddy is not remunerative one in the study area. So, the farmers adopt crop diversification.

- In Kayatar block, the average gross profit other than paddy is higher due to the adoption of crop diversification constituting Rs. 45679, Rs. 29151, Rs. 22634 and Rs. 13407 respectively. Paddy constitutes only Rs. 6443. Therefore, shifting from traditional crop paddy is beneficial to the farmers.

- The calculated rank correlation co-efficient in the case of constraints experienced by marginal farmers in Ottapidaram, Villathikulam and Kayatar are 0.98, 0.99 and 0.86 respectively. It indicates that there is a positive relationship among all the constraints experienced by marginal farmers in the study area.
Similarly, it is also found to be the same to all the categories of farmers. In the case of small farmers, the calculated rank correlation co-efficient results are 0.99, 0.99 and 0.99 to medium farmers 0.99, 0.99 and 0.98 and in the core of large farmers 0.99, 0.99 and 0.97 in all three blocks namely Ottapidaram, Vilathikulam and Kayatar therefore the hypothesis has been proved.

It is empirically proved that the hypothesis there is a positive relationship among all the constrains experience by each categories of farmers.

It is observed in the overall study area, among all the constrains, monsoon failure and climate changes are the major constrains faced by the farmers has been evidently proved in the study area.

7.2 SUGGESTIONS

To protect the present crop diversification in the study area, irrigation facility is a must. To save the future generation and to feed them agricultural food production is essential. To provide continuous water supply, it is our paramount duty to store water through percolation ponds, check-dam and desisting of the existing lakes and ponds. Government have started doing it, it is the expectation of the people from the Government to do it without any delay.

One of the constraints in the study area is migration of labour. Owing to various reasons, the agricultural labourers move out of their living places either in search of employment or for higher remuneration. Though, the government have taken many steps to improve their conditions, a lot more is to be done to retain them in agriculture.
The price of their produce varies every now then. It is due to many reasons which many of us know. It is high time that we created storage facilities to check the changing prices. Regulated markets should be allowed to function without any interference of the intermediaries. We expect the Government to fix a remunerative price to increase the quantity of agricultural produce.

The agriculturists especially from the southern region found it very difficult to get the adequate supply of fertilizer, pesticides and manures on time. So, if the Government supplies them all, in the study area they can by fertilizer, pesticides and seeds in subsidized price. This makes the cost of cultivation lesser, which will increase the average income of the agriculturists.

There must be a continuous awareness campaign for the benefit of agriculturists. This will help them to keep latest technology and changes in the agricultural operation. The Government needs to give top priority to this issue.

### 7.3 Policy Implications

Much effort had been taken by the planners, administrators, agriculture scientists and agriculture research stations in the country to improve agricultural production. They early plans, especially first plan, concentrated on agriculture. Irrigation was considered as the most important factor to increase the agricultural production. Priority was given for multi-purpose river valley project and irrigation canals. During the plan period more land was brought under plough and consequently more land got irrigation facilities.

These efforts were useful to introduce the new strategy in agriculture. The new strategy, the combination of Intensive Agricultural District Programme and
Intensive Agricultural Area Programme, were mainly responsible for introducing Green Revolution in the late 60’s of the last century. The enterprising farmers willingly adopted the size neutral biological, chemical and mechanical technologies in their farms. The Government sponsored package programme with extension services made the diffusion of technology to every household made the farmers to transform into practice. The new High Yielding Varieties (HYV) in paddy introduced by International Rice Research Institute (IRRI), Manila and new High Yielding Varieties in wheat and maize introduced by International Wheat Research Institute at Mexico were the starter of High Yielding Variety Programme in this country. Following these two international institutes, the local research institutes and stations have developed number of high yielding strains in paddy, wheat, maize, ragi, cumbu and even in some vegetables and fruits.

- In addition to the High Yielding crop the chemical technology was capable of introducing new inorganic fertilizer and fertilizer mix suitable for every crop. Instead of getting natural nitrogen from atmosphere the chemical technology provided nitrogen to boost the agricultural production. New plant protection measures with chemical pesticides protected the plant from pest attack. The consequent result was increased farm production into three times. During 70s and 80s rural households enjoyed the benefits and there was prosperity in the rural economy.

- Indian agriculture in the early years adopted a neutral mechanical technology. Tractor, ploughing and energized pump sets were the early mechanical technology adopted by Indian farmers. Tractor, ploughing and lift irrigation were mainly responsible for increasing the Gross cropped area and cropping
intensity in the country. Even though agriculture in Indian is century old we never practiced agriculture throughout the year, even in the perennial river irrigated area. In the Southern State inundation river system agriculture throughout the year was impossible. The introduction of lift irrigation created a chance for agriculture throughout the year. Even if the water ceases to flow in the river system supplementary irrigation by this energized pump sets created an avenue for second crops, third crop and even fourth crops.

- From the last ten years, in the country as a whole, the agricultural production is stagnant and the net sown area, gross cropped area and cropping intensity remain the same. Agricultural scientists are of the opinion that the latest technologies adopted in the advanced countries are essential to increase the farm production. Even the planning processes, our planners have not given equal importance for agriculture. Public investment in agriculture has come down to sizeable extent. Investment in rural infrastructure has not increased remarkably.

- The agriculture price policy is against the increase in farm productivity and farm production. To keep the inflation under control and maintain cost of living index at a lower rate agricultural prices are determined at the lowest level in most of the cases below the cost of production. Government, both the centre and state, subsidized the input cost and interest rate. In years of flood and drought loan waiving is also done by Governments. When the economy is expected to have 12 per cent growth in GDP, the targeted growth of agriculture in the present market economy has not been achieved. We never realized the four per cent growth in agriculture. The agricultural growth in past
two decades hovers around two per cent. Many feel that the Government policy is the main hindrance for the poor performance of agriculture.

- After the formation of WTO and WTO condition that no country should give more than 10 per cent input subsidy to agriculture, India is not in a position to increase the input subsidy. Many studies on subsidies have published that India has not reached the maximum 10 per cent input subsidy. The all round situation in agriculture made the situation in the rural economy against the agriculture progress since the sector is less attractive and less remunerative. Nearly 40 per cent of the farmers are ready to come out of agriculture. Already labour exodus is taking place. The urban economy is not ready to absorb the migrated labour in the secondary and tertiary activities.

- Large direct government interventions in the rice, wheat and sugar markets crowd out efficient private sector in marketing and processing.

- Export or import liberalization penalizes farmers by depressing farmer prices below parity levels (e.g., paddy and sugarcane)

- Policies must induce farmers to switch to other crops like cotton, pulses in less irrigated areas, and wheat and rice where there is good irrigation these crops must be made attractive to farmers.

- Open up exports of rice, wheat, coarse cereals, pulses, coconut and cotton.

- Well-targeted food subsidies and rural infrastructure can help agriculturists.

- Subsidies must be rationalized and given wherever it is possible.
Percentage of allocation of funds for agriculture in the budget should be increased.

7.4 AREAS FOR THE FURTHER RESEARCH

- It is found from the study that a similar study may be conducted other river bed areas of different regions.
- An exclusive study has to be undertaken for the food and non-food crops.
- Comparative study may be conducted between different blocks of a district.

7.5 CONCLUSION

Monoculture, the practice of growing only one type of crop on a certain area of land is not only risky but also results in impoverishment of soil and low productivity. Besides this, low price of mono crop production forces farmers to diversify. In order to make the farming operations a paying proposition, agriculture needs a diversification in the form of developing a wide range of crops. So, in the study area, it is found that, monsoon failure and climatic change are the rationale behind the crop diversification.