CHAPTER – VII

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

7.1 General

Agriculture is one of the world’s most important activities supporting human life. Population increase and advancement in the civilization made man settle at one place and to cultivate the same area year after year. Now agriculture has become a profession and is given the name commercial agriculture and precision agriculture. Nowadays, the population of the planet is growing dramatically. In order to meet the increasing need the farming community has to produce more and more. Under present situation, where the land is a limiting factor, it is impossible to bring more area under cultivation (extensive farming), so farming community has to tackle this challenge for producing more and more food with the available land only (intensive farming). Higher productivity, profitability and health of mankind as well as environment are the concerns of the present agriculture. Hence, much attention is paid on selection of a crop as well as land, which suits an area the best.

Land is one of the most important resources of a country and is a critical factor which determines its economic development. It supports all primary activities besides providing shelter and other social requirements. In recent years, the population explosion, changing life style and competing demands for land for
various uses have led to a change in land use pattern which has caused degradation of land resources. The transfer of land from one type of use to another type is mostly irreversible; it has on many occasions resulted in permanent changes in the ecology and the hydrologic chain. The increasing and competing demand for land both for agriculture production and for other developmental activities calls for right policy decisions on the most beneficial use and conservation of limited land resources for future.

The present study comprises of land resource management and its impact on socio-economic conditions of agriculturist in Nanguneri taluk at Tirunelveli district. An attempt has been made to study the land resources, land management and utilization. The evolution of land source study, definitions of land use parameters, land evaluation and relevant earlier works referred in the study have been described.

7.2 Findings

7.2.1 Land Resources and Utilization

Tirunelveli district received an annual rainfall 901.1mm during the year 2009-2010, which is higher by 22.3 per cent over the normal rainfall of 736.9 mm in the district.

The nansai land in Tirunelveli district is 80,032.94ha which is 11.84 per cent of the total geographical area, punsai land is 3,49,601.51ha (51.73%), and
porampoke land is 10121.58 ha, which is 1.50 per cent of the total geographical area. Canals are the major sources of irrigation in Tirunelveli district.

The food crop area is 1,43,551.79 ha in Tirunelveli district which is 83.58 per cent in the total food and non-food crops area. Paddy is the principal crop extensively cultivated in Tirunelveli district of the state having a unique two-season pattern viz Pishanam (August to November) and Kodai (December to March).

Black-gram in Tirunelveli district was grown in about 10,427.97 ha constituting 10.01 per cent of the total cropped area of the district. Black-gram is sown in low irrigated conditions. The total area of cultivating vegetables in Tirunelveli district is 3,522.35ha. Among them, onion contributes 51.83 per cent of the total area, followed by tomato which is 11.96 per cent and ladies finger which is 6.62 per cent respectively of the total vegetable cultivated area.

The total area under banana is 9,156.68ha in Tirunelveli district during 2010-11. Nanguneri, Radhapuram and Ambasamuthiram taluks together accounted for 75.08 per cent of the total area under this crop during 2010-11. The total area under jasmine flower is 1,189.21 ha in the district during 2010-11. Sankarankovil and Radhapuram together constitute about 77.08 per cent of jasmine in the district during 2010-11.

The total forest area of Nanguneri taluk has ranged from 22,352 hectares in 1996-97 to 22,648.89 hectares in 2010-11. Ponds / tank, are the major sources of irrigation in Nanguneri taluk.
The nanchai land is 11,536 hectares in 1996-97 and it was decreased to 11,085.27 hectares in 2010-11 which is 3.82 per cent decrease from 1996-97 to 2010-11. Punchai land is 41,185 hectares in 1996-97 and it was increased to 42,736.69 hectares and porampoke land is 2339 ha in 1996-97 and it was decreased to 1531.62 hectares in Nanguneri taluk.

The food crop area is 12,685 hectare in Nanguneri taluk in the year 1996-97 and it was increased to 15,858.03 hectare in the year 2010-11. The growth rate of in 2010-11 is 25.01 per cent. The net area cultivated also increased from 13,950 hectare in 1996-97 to 16416.79 hectare in 2010-11 in Nanguneri taluk.

Paddy is the principal crop extensively cultivated in Nanguneri taluk of Tirunelveli district. The total area of cultivating vegetables in Nanguneri taluk is 91.47 hectare in 1996-97 and it was decreased to 62.49 hectares in 2010-11. Sugar crop is another major fruit crop accounting for 50.17 per cent of the total fruit cropped area in the taluk during 2010-11. The total area under banana is 2,267 hectare in the taluk during 1996-97 and it was increased to 3,518.40 hectare in the year 2010-11.

Jasmine is the major flower cultivated in this taluk and the total area under jasmine flower is six hectares in 1996-97 and it was increased to 7.74 hectare in the year 2010-11. Black-gram is the principal pulse extensively cultivated in Nanguneri taluk of Tirunelveli district. Tamarind is the major spice crop cultivated in this taluk and the total area under tamarind is 118 hectares in 1966-97 and it was decreased to 70 hectare in the year 2010-11.
The nansai land is 5,688.53 hectares in Nanguneri block in the year 2010-11 and it was 5,394.47 hectares in Kalakadu block in the year 2010-11. The total area of non-food crops is 511.24 hectare in Kalakadu block in the year 2010-11. Among the non-food crop area, 459.71 hectares are irrigated and 51.52 hectares are un-irrigated area. In Nanguneri block the total non-food crop area is 537.70 hectares, among them, 515.87 hectares are irrigated area and 21.82 hectares are un-irrigated area in the year 2010-11.

The forest area of Kalakadu block is 44.62 hectares and it was increased to 22,648.48 hectares in 2010-11. Whereas forest area was 65 hectares in 2009-10 in Nanguneri block.

Ponds are the major sources of irrigation in both Kalakadu and Nanguneri blocks. During 2010-11, pond irrigation accounted for 4517.89 hectares in Kalakadu and it was 5022.10 hectares in Nanguneri block.

It is very clear from the discussion that intensive use of land, have been increased. The significant changes have been observed in cropping intensity and intensity of area sown more than once. This shows that in the taluk, the process of maximum utilization of land has been increased. But at the same time the cropping pattern is changed from irrigated crop to un-irrigated crop such as paddy to black-gram.
7.2.2 Socio - Demographic Characteristics of Agriculturist

    Majority of the respondents are in the age group between 40-50 years. The researcher concluded that there is significant association between the status of the farmers and age of the respondents.

    Majority of the respondents are Hindus and the next majority of the respondents are Christians. But there is no communal difference between the followers of these three main religions. There exists marital relationship among these religious groups of farmers also.

    Majority of the samples (273) belong to backward community, 144 respondents are from MBC community, 64 respondents are from OC community and 104 respondents are from SC/ST community. Majority of the small, medium and large farmer respondents belong to backward community. There is significant relationship between the caste and the status of the farmers.

    The study found that majority of the respondents have educational level ranging from primary to higher secondary. Illiterates are also found in these areas, which constitute 10.25 per cent. There is a significant relationship between the educational level and the status of the farmers.

    The study reveals that out of the total respondents, only 58 are joint families. The remaining 527 respondents are nuclear families. It is a common tradition that a man will form a nuclear family immediately after his marriage. The Joint family system is withering away irrespective of the poor economic condition and low literacy level.
The sizes of the families of the agriculturists are classified into three categories. This data reveals that most of the families have 3-6 children.

The study reveals that 94 per cent of the total farmers are married, 1.70 per cent are unmarried and the remaining 4.27 per cent of the respondents are divorcees / widow. It is known that, majority of the respondents are married and few of them are unmarried.

The study shows that, out of the total respondents, 94 per cent of the respondents have own house, 4.44 per cent of the respondents have rented houses and the remaining 1.5 per cent of the respondents have government free houses.

The study shows that, out of the total respondents, 74 per cent of the respondents live in tiled houses, 4.70 per cent respondents live in thatched houses and the remaining 21.10 per cent respondents live in concrete houses, in this study area.

It is obvious that 98.10 per cent of the households are electrified. Further, 11 households are electrified under Government of Tamil Nadu free electricity scheme.

The study shows that out of the total respondents, 65 per cent of them have three rooms in their houses, 27.30 per cent of the respondents have two rooms (a living room and a bed room) in their houses and 23.20 per cent have more than three rooms in their houses, in these tribal villages. Only 4.78 per cent of the respondents have got only one room in their house.
The study discloses that only 209 houses have own pump in their premise and 254 respondents draw water from the panchayat water connection. But still 122 houses have to get their life-giving water from the street pumps.

The study shows that out of 585 respondents, 129 respondents’ annual income range between ₹90,000-1,20,000, which constitute 22.05 per cent. This shows that most of the farmers come under this classification. Out of them, 118 respondents have income between ₹30,000 to 60,000, which constitutes 20.17 per cent. 19.15 per cent of the respondents’ annual income is below ₹30,000, 17.44 per cent of the respondents annual income range between ₹60,000-90,000, 13.33 per cent of the respondents’ annual income fall below ₹120,000-1,50,000 and the remaining 7.86 per cent of the respondents’ annual income is above ₹1,50,000.

In order to find out the correct estimation Gini concentration ratio was calculated. The Gini concentration analysis estimated that the value of Gini ratio was 0.261 for large farmers, 0.498 for medium and 0.572 for small farmers. It indicated that the inequality was found to be higher in the distribution of small farmers’ annual income than medium and large farmers.

The study also reveals that the consumption expenditure is apportioned among food, cloth, rent, fuel and lighting, education, medicine, social, religious celebration, entertainment and others etc. Of these 10 constituents, food occupies major part of the expenditure of the households, it constitutes 51.48 per cent. The percentage of expenditure for clothing from the total consumption expenditure is 15.07 per cent. The expenditure of fuel forms 6.66 per cent of the total
consumption expenditure. The expenditure on medicine is comparatively low due to the fact that the villages live with nature. Another source of expenditure is entertainment. The expense on social and religious celebration was 5.85 per cent and 3.08 per cent of the total. Since the rural folks have sufficient time they spend it in social celebration, which is their traditional behaviour. Households which have higher total expenditure allocated more for food, cloths, than the households with lower expenditure levels.

Majority of the respondents save their money in LIC. The important purpose of saving is to buy the purchasing implements for cultivation; it forms 37.57 per cent of the total savings. They also save to meet future needs and build house, amounting to 18.15 and 17.60 of the total savings respectively. 14.88 per cent of the respondents save for marriage expenditure of the children and the remaining 11.80 per cent of the respondents save for to meet other expenditure such as medicine expenditure and unexpected expenditure.

The study also shows the position of assets of agriculturists in this taluk. The value of land constitutes 52.34 per cent of the total value of assets. Land is the major asset of the agriculturists. The house constitutes 26.02 per cent of the total and an ornament constitutes 10 per cent of the total assets.

Majority of the respondents (30.26%) borrowed money from co-operative bank. 19.66 per cent of the respondents borrowed money from the Self Help Group, 15.73 per cent of the respondents borrowed money from the banks, 7.52
per cent of the respondents borrowed money from friends and relatives and remaining 13.50 per cent of the respondents borrowed money from moneylenders.

7.2.3 Land Management and Its Impact on Agriculturist

Majority of the respondents have 300 to 400 cents of wet land and next majority of the respondents have 200 to 300 cents of wet land.

Majority of the respondents i.e. 48.94 per cent have 100 to 200 cents of land leased in, 21.28 per cent of the respondents have 200 to 300 cents of leased land. In this study area majority of the medium farmers have to lease other land for cultivation followed by large farmers.

Majority of the large farmers have to lease out their land to others.

Out of the total 585 sample respondents, only 63 respondents own grass land. Out of 63 respondents, 30 (47.62%) respondents have below 100 cents of grass land and another 30 (47.62%) respondents have 100 to 200 cents of grass land. Only three respondents have above 200 cents of own grass land which constitute 4.76 per cent.

Majority (78.43%) of the respondents have below 100 cents of own dry land of their own in this study area.

The study discloses that majority (42.42%) of the sample respondents have 100 to 200 cents of dry puramboke land holding in the study area.

The study found that majority of the respondents (28.94%) belong to the group who cultivate wet land of about 200 to 300 cent, 25.27 per cent of the
respondents below 100 cents of wet land, 19.96 per cent come under 100 to 200 cent, 15.02 per cent belong to the group which cultivate above 400 cent wet land cultivating group and the remaining 10.81 per cent of the respondents belong to 300 to 400 cents.

Majority (39.29%) of the respondents have below 100 cents of garden cultivated land. Majority (28%) of the respondents have below 100 cents of dry land holdings which are cultivable.

The study reveals that majority (88.38) of the respondents have the land with lowest percentage of slope area between 0-15 per cent class in the study area, 15-25 slope per cent classes on 6.15 per cent respondents, 25-35 per cent class on 2.74 per cent of the respondents. 1.54 per cent of the respondents have the land with 35-45 per cent slope class and the remaining 1.20 per cent of the respondents have the land with above 45 per cent slope class. This area is under cultivation in Manjuvillai and Thirukurangudi of Kalakadu block.

The study concluded that majority (69.06%) of the respondents have got flat land, 14.70 per cent of the agriculturists have got east sloping land, 1.11 per cent of the sample agriculturists got west sloping land and 3.76 per cent of the respondents have got south sloping land. Only few respondents (2.90%) have got north sloping land.

Majority of the respondents i.e. 64.10 per cent cultivate paddy. 42 respondents cultivate cotton crop. It constitutes 7.17 per cent and 26.31 per cent
of the respondents cultivate banana crop. Coconut and vegetables are cultivated by limited respondents i.e 1.20 per cent and 1.20 per cent respectively.

The study reveals that majority (31.455) of the respondents cultivate cotton as subsidiary crop because a cotton crop takes less water.

The quantitative relationship between the production and the determinants are studied by fitting a linear production function with production as the dependent variable and total cultivated land, cropping pattern, type of irrigation, soil type, and slope of the land as independent variables. The analysis reveals that the total annual production of the agriculturists could be improved by increasing the type of irrigation and cropping pattern of the agriculturists. The measures to reduce the slope of the land among the cultivated area enhance the annual production significantly in the study area. Therefore, the first hypothesis that, “The total agricultural production is determined by the total cultivated land, cropping pattern, type of irrigation, soil type and slope of the land in the study area” is proved except in slope of the land. Hence, the slope of the land is not determined by the total agricultural production.

The study reveals that, 324 respondents have alluvial soil type. Out of the total, 48 respondents have laterite type soil. It is also inferred from the study that, 12.82 per cent of the respondents have clay type of soil, 9.23 per cent of the agriculturists have sandy soil, 7.86 per cent of the respondents have loam soil, 0.34 per cent of the agriculturists’ land has silty soil and the remaining 6.15 per cent of the respondents have other types of soil, in the study area.
The study reveals that, 75.73 per cent of the respondents have got soil losses and the remaining 24.27 per cent of the respondents do not lose soil.

Majority (48.72%) of the respondents feel that terrace is the important measure to land protection, in the study area.

Out of 585 respondents who availed land protection measures, 97 respondents have the opinion that the land protection measures are sufficient and well protected, 310 respondents feel that the measures are moderately protect and 178 respondents (30.43%) express that the land protection measures are normal and are managed by the agriculturists.

The study reveals that 75.90 per cent of the respondents cultivated paddy two times per year and 24.10 per cent cultivated paddy only one time per year.

The study discloses that out of the total 31.62 per cent of farmers opinion that short cultivation period is the reason for paddy cultivation. Paddy crop is suitable in this area according to 55.04 per cent of farmers and the remaining 13.33 per cent of farmers feel that moderate profit to be the next suggestion.

The major source of finance is made by bank loan. Out of 585 respondents, 18.63 per cent of the respondents manage with their own source. 272 respondents have borrowed from bank for their expenses for cultivate purpose which constitutes 46.50 per cent and remaining 34.87 per cent of the respondents borrowed money from self-help group.

Out of 585 respondents, 83.76 per cent of the respondents obtain support from the government and the remaining 16.24 per cent of the respondents do not
get any support from the government. Majority (41.84%) of the farmers get all types of benefits from the government. Among the 205 who get all types of support beneficiaries, 80 are large farmers, 89 are medium farmers and 36 are small farmers.

Majority (41.37%) of the farmers use canal irrigation systems followed by ponds, well and tube well irrigation systems which constituted 23.59 per cent, 20.51 per cent and 14.53 per cent respectively.

The study shows that majority of the respondents are of the opinion that insufficient water is the major problem, which constitute 55.73 per cent. Out of them, 31.62 per cent of the respondents say that water is not available in time and the remaining 12.65 per cent of the farmers say high cost of irrigation to be a problem.

It is clear that monsoon failure (54.07%) was the main reason for agriculture failure by the agriculturists. Then, importance of traditional cultivation (50.68%) was the second most important reason. Agriculture land usage decreased (49.21%) was the third reason, soil protection is less (48.35%) was the fourth reason and there is no planning in agriculture land (47.71%) was the fifth reason for agriculture failure by the agriculturists. There is no development of agriculture land (47.12%)

The study reveals that 55.73 per cent of the respondents feel that the sand mining activities highly affect their agricultural production mainly in the Kalakadu block, 31.28 per cent of the respondents also feel that the sand mining activities marginally affect their agricultural production. Only 12.99 per cent of the
respondents state that the sand mining activities do not affect their agricultural production because these are peoples who live in non-sand mining village like Nanguneri block.

In this study Factor Analysis is applied for identifying the impacts of soil digging in rivers and the results show that 11 factors are reduced to five variables and are given different names by using factor analysis. Thus ‘Water Problem’, ‘Soil Problem’, ‘Crop Failure’, ‘Fodder Shortage’ and ‘Food Shortage’ have been identified as the impact of soil digging in the rivers, in the study area.

The study suggested that 35.04 per cent of respondents want the awareness on environment. Government fixing target for sand mining is expected to control sand mining activities according to 21.54 per cent of the respondents. 15.90 per cent of respondents suggest to reduce illegal sand mining. The remaining 27.52 per cent of respondents want to reduce indepth sand mining.

Another factor analysis is employed to analyses the reasons for shifting from agriculture to non-agriculture in the study area. Hence, the 11 factors are reduced to five variables and are given different names by using factor analysis. Thus, ‘Bad Environment’, ‘Crop Failure’, ‘Other High Income’, ‘Labour Problem’ and ‘Low Production’ have been identified as the reasons for shifting from agriculture to non-agriculture in the study area.

Chi-square analysis is employed to check the relationship between the important socio-demographic characters. The calculated value is greater than the table value at 5% level of significance in all the factors. So the results of socio-
demographic factors are significantly related with the land utilization of the farmers. Therefore, the second hypothesis is ‘there is no significant relationship between the socio-demographic characters such as age, religion, community, educational level, occupation, marital status, type of family, size of family and the land utilization of the farmers is invalid and it is rejected.

There is a relationship between the land utilization and the socio-demographic characters. In order to identify the factors which influence the land utilization, a multiple log linear regression model was estimated. In the case of land utilization and socio-demographic character of farmers, the R² indicates that all the explanatory variables together accounted for 43.40 per cent variations in the land utilization of the farmers. Out of eight independent variables, age and educational qualification have a greater influence on the determination of the land utilization. The ‘F’ value indicates that the fitted regression model was statistically significant at five per cent level.

7.3 Suggestion

- The sample survey of the two blocks, one in Kalakadu and the other in Nanguneri irrigation is the most important single factor to bring about high intensity of cropping. There are reports on the impact of irrigation on cropping pattern which shows that the farmers have attained more intensity of cropping, where there is provision of irrigation and a favourable input supply system. Arrangements of credit at a reasonable
rate of interest and timely distribution may also encourage the farmers particularly, the small and marginal, to go in for modern inputs for better operation of agricultural land.

- The conversion of agricultural land for non-agricultural purpose and conversion of paddy fields into banana and coconut cultivation is enormously taking place in the study area. It will certainly result in food scarcity. The government should take steps to control land conversion. Unless land conversion is controlled forthwith, there will be absolutely no paddy cultivation at all in the district in the near future.

- Banks should encourage and extend the required financial support for setting up bio-fertilizer and bio-pesticides production units, vermi composting, coir pith composting units, etc., by individual farmers / SHGs for increasing their supply, availing the subsidy available from KVIC/Gol schemes.

- Financing of farm ponds is required to facilitate water and recharge of ground water.

- Banks may avail 100% refinance being extended by NABARD for wasteland development activity.

- Banks may formulate schemes for farmers who take up, On Farm Development Works such as, land leveling, bunding, field channels and drainage, etc under well command and extend financial assistance.
- Organic farming and export of fruits/vegetables (organically grown) are good business proposition and banks may reach out to these farmers for the credit requirements.

- Evaluate physical, chemical and biological effects of instream mining on a river basin scale, so that cumulative effects of extraction on the aquatic and riparian resources can be recognised and addressed at various levels for proper remedial measures.

- There is an urgent need for strengthening multidisciplinary studies on the rivers for providing adequate scientific information to river restoration and management activities.

- Awareness campaign should be conducted among people about the various impacts of river sand mining, present state of river environment, finite character of river sand, use of alternatives to sand and immediate need for control measures.

- Waste land development programme and micro irrigation system has to be implemented for increasing the agricultural produces by way of more food and income per drop of water in view of the limited water resources in the districts.

- A new appropriate cropping pattern should be suggested according to nature of soil, availability of water supply, topography and other local situations.
• One of the major problems of the farmers is shortage of water. Where average rainfall is low, dry-farming system should be implemented in an efficient way. Use of dry yielding and quick yielding seeds should be promoted in such areas. Moreover, various drought resistance varieties can be bred.

7.4 Conclusion

Land is one of the important factors of production, which provides food and raw materials for industries. This way land forms the most important wealth of a country. The appropriate use of land is a matter of utmost concern to its people. The land utilization as per its capability ensures good result in production of a country. The improper and limited use of it can lead to economic deterioration. Hence, it is necessary to utilize land in an efficient and significant way. For this purpose, a country must have a proper land use pattern which may avoid the mal-combination of factors of production.

It is very clear from the discussion that intensive use of land, have been increased. The significant changes have been observed in cropping intensity and intensity of area sown more than once. This shows that in Nanguneri taluk, the process of maximum utilization of land has been increased. But at the same time, the cropping pattern is changed from irrigated crop to un-irrigated crops such as paddy to black-gram.
In this study, the results of socio-demographic factors are also significantly related with the land utilization of the farmers. Among the significant variables, age and educational qualification have a greater influence on the determination of the land utilization.