Chapter - VI
SUMMARY AND CONCLUSIONS

The provision of food security to its citizens is the main aim of most countries in third world. The concept of food security has been assuming critical focus in a member of world conferences convened by the United Nations in the 1990s. The Government of India has been conducting many programmes and also preparing a bill to ensure food security in this context.

The present study on food security in Tamil Nadu with a special reference to Tiruchirappalli district has been undertaken with a view to study the food security level and assess the total availability and total requirement of food grain production and the role of the State in bridging the gap by its direct intervention through its network of public distribution system and indirect intervention by taking steps to increase food grain production and implementing various employment programmes to increase the economic access.

6.1 DATA, STUDY AREA AND SAMPLING

Both secondary and primary data were collected for the study. The secondary data were collected from various published sources. Primary data were collected through field enquiry. Through personal interview method, the data were collected from sample respondents in the selected villages during January 2008 to December 2008.

Two panchayats, namely, Shobanapuram and Tiruverumbur were selected to study the household level food security. A multi-stage random sampling technique
was applied to select the ultimate respondents. The sample size was 180 households in each village.

For the purpose of analysis, the sample households were post-stratified into two income groups namely, low income and high income. In order to analyze the functioning of Public Distribution System (PDS), data on monthly allotment of essential commodities to ration shop by the Taluk Supply Officer and subsequent off-take by the cardholders were collected from ration shops in sample villages. Data on the participation of household members in Noon-Meal Scheme and Integrated Child Development Scheme were gathered to analyze the role of such welfare measures in enhancing food security.

6.2 TOOLS OF ANALYSIS

The present study aimed at examining the various issues related to food security both at macro and micro levels. Simple percentage analyses were performed to examine the institutional set up related to food security at State level.

At household level, the food demand pattern was estimated through Almost Ideal Demand System (AIDS). The model was applied to estimate a system of demand functions for rice, pulses, edible oils, milk, vegetables, meat and other food items. The economic access to various foods was measured through price and expenditure elasticity.

The food consumed by households yields certain amount of calories, in turn reflecting nutritional security. The relationship between the calorie acquisition and factors influencing such acquisition was estimated by a mixed logarithmic calorie function.
To evaluate role of PDS rice in enhancing food security, a rice consumption function was fitted. Besides, Tobit model was employed to estimate the probability that a household would participate in PDS through purchase of rice and the intensity of such purchase. Finally, using the data on allotment and off-take in ration shop, an optimal allotment scheme was evolved.

6.3 MAJOR FINDINGS

6.3.1 Institutional Set up

The analysis revealed that the existing trend in diversion of revenue funds away from social and community services and economic services including agriculture to non-development expenditure, marginal increase in per capita income, declining net area sown, dwindling size of operational holding, increasing urbanization and population density, work force employed mostly in unorganized sector, higher level of school drop outs among girls and high proportion of population covered by a medical practitioner especially in rural areas, could slow down the process of enhancing food security, education and health services in the State.

Analysis on consumption expenditure of the population revealed that cereals constituted a major share in the expenditure. However, there was a shift in expenditure from cereals to non-cereal high quality food items like pulses, milk and milk products and vegetables. This has significant implications on food demand and resource allocation to non-cereal crops to enhance food security.

Since the State adopted universal targeting in distribution of rice, the number of cardholders under PDS network was on the increase. Similarly, the beneficiaries of Noon-Meal Scheme and ICDS were increasing. These welfare schemes had
enhanced food security besides education and health status although fiscally burdening.

The health indicators like birth, death rates and infant mortality rates have been declining. However, these rates were higher in rural area than that in urban area. There arose an increasing need for creating more infrastructure and services particularly in the rural areas to enhance food, health and educational status.

6.3.2 Agricultural Performance

The cropping intensity at State level has declined and a marginal rise in cropping intensity during green revolution could not be sustained in post-green revolution period. Similarly, the crop area under food grains has been declining at the rate of 0.97 per cent per annum. Food grain production in the State had grown at 0.98 per cent per annum in the post-green revolution period compared to 0.70 per cent per annum in green revolution period, but less than the population growth of 1.12 per cent. Productivity of food grains had increased at 1.96 per cent per annum in post-green against 2.04 per cent in green revolution period. The stability in yield was observed in most of the cereal and pulse crops. Aggregate index on the cropping pattern showed that the area under food crops has been declining.

The implications are that per capita food production is declining and there existed a gap between the demand and supply. In livestock sector, though the per capita availability of milk and egg were increasing but found below the nutritional requirement. In fish production, inland fish production has been declining and such loss in production could not be compensated with the marine fish catch. Thus, there existed considerable gap between food demand – supply and agriculture and
livestock sector need to achieve a higher growth rate to bridge these gaps and also to achieve self-sufficiency in food production.

The per capita per day availability of food grains in Tamil Nadu has been decreasing from 392 gm during 1960 to 277 gm in 2000. This is very low compared with Indian Council of Medical Research (ICMR) recommended level of 520 gm.

The physical access to food grain is increased by supplying food grains through PDS but the economic assess, i.e., the required purchasing power to demand food grains is very low. The government is implementing many employment programmes which increase the economic access.

6.3.3 HOUSEHOLD FOOD SECURITY

Using the primary data, the issue on food security at household level was examined based on the access to infrastructure facilities in the sample villages and through analyzing the household consumption data in both Shobanapuram and Tiruverumbur panchayat.

6.3.3.1 Expenditure Pattern and Nutritional Adequacy

The socio-economic characteristics of low and high income households in the study areas would reveal that income is a major factor influencing size of family, literacy rate, size of operational holding, possession of assets etc. The proportion of different sources of income indicated that the low-income group in both the regions depended highly on wage earnings.

Among the food expenditure, though cereals dominated in the overall expenses, expenditure on pulses, fruits and vegetables and meat and eggs were well
pronounced. The proportion of expenditure spent on education and for medical care increased with the level of income.

The per capita nutritional status of the households in terms of energy (Kcal/day), protein (gm/day), and calcium (mg/day) based on the food consumed indicated that nutritional adequacy increased with the increase in income of the households. Between two panchayats, percentage of households who had achieved nutritional security in terms of all the three combined were more in Tируverumbur panchayat than those households in Shobanapuram panchayat. Thus, income played a major role in consumption pattern and nutritional adequacy.

6.3.3.2 Demand for Food

The results obtained through AIDS model showed that income, price, educational status and family size influenced the demand for various foods. The consumption of rice set the demand for other foods. The expenditure elasticities for rice, milk and vegetables were more than unity in Shobanapuram panchayat and any rise in income would increase the demand for such foods more proportionately than other foods. However, income would alter the demand for food items more prominently in low income group than in high income group. The own price elasticity for various foods indicated that the rise in price would seriously affect the consumption of pulses and vegetables in Shobanapuram panchayat and also for low income group in Tируverumbur panchayat. The education level and family size influenced the demand for commodities such that higher the level of education more the demand for non-cereal items like milk, vegetables etc. and higher the size of family lesser was the per capita consumption levels of rice and milk in low income group particularly in Shobanapuram panchayat. Thus, a rise in income and
education and the small family size paves way for enhancing household food security.

6.3.3.3 Calorie Acquisition

The food demanded/consumed by households yielded certain calories and the calorie function indicated that rice supplied major source of calories. The variable income and educational level had a significant influence over the calorie acquisition in all the income groups. Family size had adverse effect as larger the size, more was the reduction in the per capita consumption and per capita calorie acquisition in the study areas. Thus, it is recapitulated that rise in income levels and lowering the household consumption unit enhance calorie acquisition. Food security is exacerbated by poor education where the members of the households could not enhance the calories especially in Shobanapuram panchayat. However, higher education did not guarantee high level of calories acquisition as there were households with nutritional inadequacy even in Tiruverumbur panchayat. This stressed the importance of nutritional awareness about the food consumed by the households in order to enhance food security.

6.3.3.4 Education and Healthcare

In addition to the composition of food consumed by the households, education, safe drinking water, sanitation and environmental hygiene influence the food and nutritional security of household. The percentage of drop out in the Shobanapuram panchayat among male and female in age group between 6 and 14 was 0.57 and 2.45 per cent respectively. The drop out rate between 15 and 25 years was 14.33 per cent among males and 18.29 per cent among females. The poor income of households and the necessity for more family members to earn were the
reasons for such drop out. Besides schools beyond primary level were located outside the village.

Drinking water was provided through “public tap” to rural households in both the Shobanapuram panchayat and Tiruverumbur panchayat. Besides, the individual houses were also provided with “house connections” and the number of households covered by such facility increased with the income levels.

As far as sanitation is concerned, majority of households did not have the closed toilet in their houses particularly in Shobanapuram panchayat. The local bodies in villages arranged for the collection of garbage and waste disposal. However, such services were not provided at satisfactory level of inhabitants. Though sample households did not report major health ailments among the family members, the demand on primary healthcare by low income households was found apparent.

### 6.3.3.5 Impact of PDS and other Welfare Schemes

Rice from PDS constituted 36.86 and 26.34 per cent of the total rice consumed per month in the both the villages respectively. Thus, the dependency on PDS rice was relatively higher in the Shobanapuram panchayat than in Tiruverumbur panchayat and in Shobanapuram panchayat, the dependency on PDS rice increased with the decrease in income levels.

The rice consumption function showed that the price coefficient for PDS rice was negative and significant in Shobanapuram panchayat indicating that higher the price of rice at PDS, lesser the total quantity of rice consumed by the household. The variable, open market price, however, showed significant positive influence on the quantum of consumption of rice by households in both the panchayats. The per
capita income had also shown positive influence in the Shobanapuram panchayat contrary to negative influence in Tiruverumbur panchayat. The results also showed that family size had significant positive influence on rice consumption quantity in both the panchayats. The size of land possessed by households also showed positive significant influence in Tiruverumbur panchayat implying that the quantum of rice consumed increased with the increase in farm size, as the lands possessed by the households were one of the means of supply of rice for households in that panchayat.

Thus, the overall consumption function results implied that households in the Shobanapuram panchayat were responsive to PDS price such that any price hike would reduce the demand for rice and thus it would pave way for lesser calories. In the Tiruverumbur panchayat, the availability of own stock through cultivation of rice had a significant influence over the quantum of consumption of rice and higher the income lesser the quantity of rice consumed.

It is seen that share of own stock or open market purchase and price difference had greater influence over the purchase of PDS rice. The probability and intensity of purchase of rice by a cardholder in Shobanapuram panchayat was found higher than that of a cardholder in Tiruverumbur panchayat implying high intensity of participation and dependence on rice from PDS.

The quantum of off-take decreased with increase in price at PDS and such decline in Shobanapuram panchayat was more pronounced than the Tiruverumbur panchayat as the consumers in Shobanapuram panchayat were more sensitive to any price changes than consumers in the Tiruverumbur panchayat.
Thus, to enhance food security, through supply of calories from rice, any decline in price would enhance off-take, more considerably in Shobanapuram panchayat than in the Tiruverumbur panchayat. Similarly, the argument could be that any hike in issue price in the Shobanapuram panchayat would more severely affect the savings to buyers than in the Tiruverumbur panchayat. Since it would not be possible to have different issue prices, increasing the quantum of allocation of rice in the Shobanapuram panchayat would be the appropriate strategy.

An optimal allotment scheme for other essential commodities evolved through the optimal control model suggested lesser allotment of sugar, in the Shobanapuram panchayat and lesser allotment of wheat and kerosene in Tiruverumbur panchayat as against the existing allotment levels.

Government intervention through Noon Meal Scheme and Integrated Child Development Scheme had benefited the both type of households in Shobanapuram panchayat and low income households in Tiruverumbur panchayat. The households participating in these welfare programmes were able to enhance their nutrition level as the participation provided additional calories to the households besides education and health which otherwise would make these households seriously food insecure.

6.4 CONCLUSION

To ensure food security, a balanced growth in agriculture, industry and tertiary sector is essential. The State’s development expenditure has to be enhanced in social and economic services. There is a need for restoring fallow lands, implementing cost-effective small size agriculture, arresting urbanization through gainful employment in rural areas, improving access to schools of higher learning and improving the sanitation and primary healthcare at rural areas. The decline in
cropping intensity and area need to be compensated with the increase in productivity level of food crops and livestock to ensure an enhanced production and food self-sufficiency.

Households satisfying the nutritional norms increased with the level of income and education. Creating more purchasing power through productive employment in Shobanapuram panchayat is crucial in enhancing food security. Besides, nutritional awareness about the food consumed by the households is essential even in higher income households. The size of family had negative influence on the calorie consumption. Hence promoting small family concept will pave the way to enhance the food consumption and nutritional status. Any further hike in PDS price would affect the consumers in Shobanapuram panchayat more than those in Tiruverumbur panchayat. Hence, issue of essential commodities to cardholders need to be more targeted. Instead of universal targeting, the benefits should be limited to poor income households or location specific. Rice at one Rupee per kilogram, Noon-Meal Scheme and Integrated Child Development Scheme provided safety net to poor households. Their services however need to be improved. More selective approach in identifying and targeting households would further improve the services provided by such welfare schemes.