CHAPTER- II

REVIEW OF LITERATURE AND METHODOLOGY

A study on any aspect may be made good enough only if the existing studies related to that aspects, features, suggestions and methodology are known. In this chapter, an attempt has been made to review plethora of literature on the following subjects namely cost and return structures, farm efficiency and marketing in cotton cultivation. Having considered the paucity of literature on the economics of cotton cultivation, available works related to the study have been critically reviewed and presented. Similar studies relating to the cost and return structures and farm efficiency of other crops using the same methodology have also been taken into consideration, because, they would be of
great methodological interest and serve to draw inferences which will be useful for theoretical underpinning and policy formulation.

2.1. STUDIES RELATING TO COST AND RETURN STRUCTURE

James Quingly Harrison\(^1\) in his study, ‘Agricultural Modernisation and Income Distribution: An Economic Analysis of the Impact of New Seed Varieties on the Crop Production of Large and Small Farms in India’, studied that cost and return structure of small and large farmers in Tanjore District of Tamil Nadu. The collected primary data had been used for the analysis. The study revealed that small farmers spent higher amount of cost per hectare on the inputs. Chemical fertilizer was the highest input cost that incurred both by the small and large farmers, followed by the input, cost of seed.

Peter\(^2\) in his study, ‘Input – Output Relationship of Banana Plantations in Kanyakumari District (Tamil Nadu)’ fitted a Cob-Doughlas model of production function and estimated the productivity of various inputs used in banana cultivation. He found that there was a significant and positive response in gross income regarding the input manure.

Morathi\(^3\) in his research study, “Comparative Economics of Cotton and Competing Crops in Khargone District of Madhya Pradesh” made a comparative economic analysis of the two varieties of cotton namely, hybrid cotton and local variety. The area of his study was Madhya Pradesh. The period of the study was 1972. Primary data had been used for the study. The study found that the cost of hybrid cotton variety
was Rs. 963.46 per hectare and it was Rs.650 per hectare for the local variety. The net returns from the hybrid and local variety were accounted Rs.2786.94 and Rs.1558 per hectare respectively.

V.K. Mudalia\textsuperscript{4} in his study “A Study of Development of Hybrid-4 Cotton in Gujarat and its Production Economics” compared the cost and return structures of hybrid cotton under irrigated and rainfed conditions. By using primary data, the study revealed the following. The per hectare average cost of cultivation of cotton was found to be Rs.2667.02 under irrigated conditions, while it was Rs.1605.29 per hectare for rainfed cotton cultivation. In both cases, insecticides, fertilizers and labour changes were the major cost components. Net return in irrigated cotton cultivation was found to be relatively higher than the rainfed cotton cultivation.

Rawalji\textsuperscript{5} in his work, “Economics of Hybrid Cotton – A Case Study in Anand Taluk”, estimated the cost and return structure of hybrid cotton between tractor operated farms and non-tractor operated farms. Primary data was collected for the study. The study revealed that the cost of cultivation of tractor operated farm was Rs.2303 per hectare, while it was Rs.2324 per hectare for non-tractor operated farms. The tractor utilized farms yielded a net profit of Rs.2356 per hectare, while it was only Rs.2284 in the case of non-tractor operated farms. Further, the study found that the medium category farmers were found to be produced higher output per unit of input than the small and large category of farmers.
In Jharkhand the cost benefit ratios were 1:1.57 and 1:1.90 on TMC and EMC farms respectively. It indicated that the per hectare return on EMC farms was higher over TMC farms. As far as Marketing Efficiency was concerned, it was 1.892 and 1.858 on TMC and EMC farms respectively in Bihar. It implied that there was almost traditional pattern of marketing of mangoes in Bihar. In Jhargand the marketing efficiencies were 0.91 and 0.98 on TMC and EMC farms respectively. It showed that there was a little difference in the marketing efficiency in Jhargand. However, it was a bit higher on EMC farms.

V.K. Mudalia and M.V. Kukadia, in their study, “A Study on Economics of Cotton Cultivation in Baroda District” estimated the cost of cultivation of cotton in Baroda District of Gujarat. Primary data had been used for the study. The study worked out the cost of cultivation of cotton of MCU-5 variety. In the production of both the varieties of cotton, it was found that fertilizers, plant protection, chemicals and human labour were the major components of items of cost.

The Department of Economics of Agricultural University, Coimbatore on “Studies on the Cost of Production of Major Crops in Tamil Nadu” conducted a survey on the cost of cultivation of major crops in the districts of Tamil Nadu. The cost and return structures of irrigated and unirrigated were analysed. It was found that human labour and fertilizer were the major item of input cost under irrigated conditions. In the case of cost accounted for human labour only.
Bhatia and Ram in their study, ‘Marketing Efficiency in Retail Vegetable Markets in Delhi’ studied the marketing costs and margins, consumer prices, availability of physical marketing facilities and marketing competitions. They found that the retailer’s margin accounted for about 50 per cent of the consumer’s price and the consumers had to pay price due to the perishability. Retailers pavement sellers get the lowest average percentage of net retail margins.

Calkins and Weston in their study, ‘Improving Marketing of Perishable Commodities: A Case Study of select vegetables in Taiwan’ designed two indices for measuring marketing efficiency, one technical efficiency and another economic efficiency. According to them technical efficiency index was worked out as variable marketing costs per final weight delivered per unit of distance and economic efficiency index was estimated as the sum of marketing agents profit divided by variable marketing costs.

The Cotton Development and Research Association of the South Indian Mills Association conducted a survey on the economics of cotton cultivation and the profitability of different varieties during the year 1982-83. The study found that LRA-5166 variety earned highest profit during the winter season. When calculating the cost and return structure of cotton cultivation it was found that the operational cost was the determining factor that fixed the net profit neglecting the fixed costs which also formed a major component in total cost.
A survey was conducted by the International Cotton Advisory Committee\textsuperscript{11} on the ‘Cost of Production of Raw Cotton’ divided the costs into two categories namely direct cost and indirect cost. Direct cost was associated with physical production. It included on-farm production and harvesting cost and off-farm cost like transportation and included management and land cost. These two kinds of costs were termed as the gross cost for producing seed cotton.

Haque, Sharma and Bhatia\textsuperscript{12} in their study ‘Temporal and Spatial Variations in Factor Shares in Indian Agriculture’ measured the relative role of different factors in influencing intra-regional and inter-regional variations in productivity. The findings were that the profitability was on the decline in all the regions and the rate of decline was higher in the more developed states. The infrastructure facilities like irrigation, input supplies, extension activities and marketing facilities needed to be strengthened. The agricultural policies should be uniform and consistent with the national goals of optimal resource use and production.

Abhi, Kumar and Mathur\textsuperscript{13} in their study, “Technological Change and Factor Shares in Cotton Production – A Case Study of Akola Cotton Farms” derived indirect production elasticities for three varieties of cotton namely Desi Cotton, American Cotton, and Hybrid Cotton. They used Lau – yotopoulus profit function along with the variable input demand equation relating to labour. They utilized farm level primary data for their research study. The study area was Akola district in Maharashtra State. The reference period was 1979-80. They as sample selected 200 farmers who were growing three
varieties of cotton in the study area. They estimated profit equation along with input demand for labour equation jointly by using Zellner’s seemingly unrelated regression function. The study revealed that the share of land in cotton production was the maximum for all the three varieties of cotton, ranging from 0.42 for desi cotton to 0.54 for American cotton and hybrid cotton. The share of labour substantially decreased as one shifted from old to new technology. The share of capital in hybrid cotton technology was biased towards land, capital and labour.

Senthamaraikannan\textsuperscript{14} in his research study, ‘Production and Marketing of Irrigated MCU-5 Cotton at Srivilliputtur Taluk – A Case Study’ analysed that the yield per acre for small farmers was greater than that of large farmers. The reason might be more efficient personal management and effective supervision of the small farmers than that of the large farmers in the study area. He also found that soil conditions, rainfall and marketing problems could also be considered as the major factors restricting the yield potentiality of MCU-5 cotton in the study area.

Subramanian\textsuperscript{15} in his research work, ‘Cotton in Madurai District – An Economic Analysis’, analysed the yield gap and net return in two varieties of cotton in Madurai district. The study found that yield gap was higher in LRA-5166 variety than in MCU-5 variety. Human labour and net return had greater impact on the yield of cotton. Further, it was noticed that water control, insects, credit and input availability were the major constraints in the cultivation of cotton of two varieties.
Iyyampillai and Swaminathan\textsuperscript{16} in their study “Inter-regional differences in the farming systems in Madurai District” examined the influence of well irrigation on changes in the cultivation of cotton in respect of two day and two week farms. The study highlighted the cost of cultivation for dry and wet farms producing cotton. The average cost of cultivation for dry farm was found to be Rs.2041, while it was Rs.4249 for the wet farms. Further, the study revealed that the per acre value of hired labour, fertilizer, pesticides, family labours and irrigation charges were significantly higher in wet farms than in dry farms. But per acre value in the case of seed and manure were higher in dry farms then in wet farms.

Mahitha and Hemachandru\textsuperscript{17} in their study, ‘Resource Use Efficiency in Paddy Cultivation in Andhra Pradesh’ examined the resource use efficiency in paddy cultivation. The study highlighted high degree of inefficiency. Since the marginal value productivity to marginal factor cost ratios, the inputs were found to be less than unity. The study suggested the need for reorganization of farm resources in paddy farms to increase the level of output in Andhra Pradesh.

Sharma in his study\textsuperscript{18}, ‘Productivity Variations in Indian Agriculture’ analysed productivity variations in respect of seven crops namely wheat, rice, maize, gram, rapeseed and mustard, sugarcane, and cotton. The analysis of productivity variations in respect of crops in various states revealed that productivity ranking changed noticeably overtime. The study also found existence of productivity gaps among various states. The study concluded that the productivity gaps could be minimized by bringing the farmers in
the ambit of efficient extension education and training activities, sound government policies and efficient supply network of various technological inputs.

Yadav.N, Azad, Yadav.R and Gupta\textsuperscript{19} in their study, ‘Resource Use Efficiency in Crop Production of Etawah District in Uttar Pradesh’ studied and estimated the cost and return structures, net profit and productivity of resource inputs used in crop production. The analysis revealed that the yield of different crops could be maximized by shifting and allocating farm resources. The study suggested diversion of excessive family labour and bullock labour to subsidiary occupations.

Nirmala\textsuperscript{20} in her study, ‘Economic Analysis of Rice Cultivation’ observed that female labourers were preferred for most of the farm activities. The small farmers incurred more expenses on labour employment compared to the large farmers. The small farmers incurred higher cost of cultivation and large quantity of output per acre than the large farmers.

Randev, Tewari and Sharma\textsuperscript{21} in their study, ‘Rationale of Resource Use in Apple Cultivation – A Case Study of Tribal Area in Himachal Pradesh’ estimated the marginal value productivities of factor inputs utilized in apple orchards and compared them with their respective acquisition cost. The study found out that inefficiency in the use of input resources. The expenditure on human labour led to higher returns on small and medium orchards indicating scope of additional absorption of labour into cultivation of apple.
Sankar Majumdar and Srijib Patra\textsuperscript{22} in their study, “Prospects of Dry Land Farming in West Bengal” examined the economic advantages enjoyed by the farmers cultivating dry land crops. To analyse the economic advantage of dry land crops, cost of cultivation, labour requirements, revenue earning and resource use efficiency were estimated. The study highlighted the fact that the cost of production of dryland crops was very low and the net revenue per one rupee of investment was much higher.

D. Susheela\textsuperscript{23} in her research work, “An Economic Analysis of Cotton Cultivation in Rajapalayam Taluk, Kamarajar District – A Comparative Study” selected two varieties of cotton and analysed the cost and return structure in respect of small and large farmers under each variety. The study was higher with Rs. 4800.71 for large farmers than small farmers with Rs. 4608.57 in LRA-5166 variety. Small farmers incurred a higher cost of Rs. 4777.26 in mcld-5 variety. In the cultivation of both varieties of cotton, human labour and fertilizers were found to be the major items of expenditure for small farmers than for the large farmers.

Srinivasan\textsuperscript{24} in his study, ‘Production and Productivity of Irrigated and Rainfed Crops in Tiruchirapalli District’ estimated the production of irrigated and rainfed crops in the Tiruchirapalli District. Cost and Return structure of paddy cultivation in respect of small and large farms were analysed. The cost of production of commercial crop - Groundnut was also estimated. The study observed that there existed a significant difference between cost and return structure in the case of small and large farmers in the
cultivation of paddy and groundnut. Further, it was found that the cost of cultivation varied universally with the area of cultivation.

Shyam Sundar, Nanja Reddy and Nagaraj\textsuperscript{25} in their study ‘Onion Production Under GroundWater Irrigation – An Econometric Analysis’, found that out of the total cost of production the share of recurring expenses was highest with 78 per cent followed by overheads with 14 per cent and the remaining went to marketing expenses which accounted 8 per cent in the case of onion production. The cost of production was relatively higher in the case of large farmers when compared to the small farmers in the study area. The reason was mainly due to the intensive use of inputs by the large farmers especially nutrient components namely fertilizers and farmyard manure. The labour absorption period was four months. The labour cost was the single largest item accounting for 33 per cent of the total cost of production, and 26 per cent share of total cost went to manures and fertilizers in the study area.

Jeganathan\textsuperscript{26} in his study, “Farm Size, Productivity and Technology Relationships – A Case Study’ revealed that as farm size increased, the percentage of area under non-grain crops increased. The use of bullock labour decreased as farm size increased. Employment of human labour was found to decline along with increased farm size. The study observed that average working capital per acre and per man day declined, whereas the average fixed capital, per acre and per man day increased with increase in farm size. The gross and residual productivity declined gradually as the farm size increased.
Vishweshwar\textsuperscript{27} in his study, ‘Economics of Hybrid Cotton with Special Reference to the Pest Management in Malaprabha Command Area’ measured the efficiency of various resource inputs used in the production of cotton by intensive Pest Management (IPM) and Non IPM adopted farmers in Karnataka State. The study observed that the non-IPM farmers underused land and overused human labour. The Marginal Value Productivity to Marginal Factor Cost Ratios for seeds, fertilizers, and pesticides were found to be negative for the above farmers. In the case of IPM adopted farmers, the study found underutilization of land, labour and seeds.

Haridoss\textsuperscript{28} in his study, ‘Sugarcane Cultivation – An Econometric Analysis’ highlighted that the returns per acre and net income of small farmers were higher than those of large farmers. The per acre cost incurred by the small farmers showed a higher level than that of large farmers in the study area.

Aswatha Reddy, Chandrasekar and Srinivasa Gowda\textsuperscript{29} in their study, ‘Resource – Use Efficiency in Groundnut Production Under Rainfed Conditions’ revealed that the regression coefficients of land, farmyard manure and seeds were positive and significant at 5 per cent level. It means that one percent increase in investment on these resources over and above the geometric mean level would positively increase the groundnut yield in the study area. The regression coefficient of bullock labour was insignificant as well as negative in the study area.

Sathilal and Hiremath\textsuperscript{30} in their study, ‘Resource-Use Efficiency in Ber Orchards’ observed that the ratio of marginal value product to marginal factor cost for canal was
33.6 and for plant protection chemicals it was 18.75 which was more than unity in small as well as in large orchards. It implied that there was a scope for increasing returns from Ber Orchards by increasing the use of these input resources. The ratios were less than unity for labour and fertilizers in small orchards and for labour, large orchards indicated that these resources were over head in the production process in the present study.

Padmanaban et al in their study ‘Cotton Production in Tamil Nadu a Decomposition Analysis’ found that the contribution of yield was the major factor that accounted for the growth of cotton production. The study highlighted the need and necessity for undertaking detailed constraint analysis research in the major cotton growing districts of Tamil Nadu. Further, it suggested that appropriate future efforts must be taken to increase the productivity of cotton.

Venkataraman and Srinivasa Gowda in their study ‘Productivity and Resource Use Efficiency in Tomato Cultivation – An Econometric Analysis’ found that the regression coefficient of the land area under the crop and staking material were positive and significant at 5 per cent level and while those for fertilizer it was significant and positive at 1 per cent level for small farmers. In the case of large farmers the coefficient of fertilizers, human labour and animal labour were positive and significant at 5 per cent level. The sum of elasticities were 1.0434 and 1.0712 for small and large farmers respectively. The yield could be increased by increasing the area of land in the case of the small farmers but there was no such hope for additional area under tomato cultivation for the large farmers.
Jain and Idnani\textsuperscript{33} in their study, ‘Resource Productivity and Sustainability of Rainfed Paddy in Madhya Pradesh’ estimated the cost and return structure of rainfed paddy in the study area. The study revealed that the cost of cultivation of rainfed paddy per hectare was the highest for small size group of farmers. Large farmers were found to be the major item of input cost accounting for one fourth of the total cost.

Singh and Job Beena\textsuperscript{34} in their study, ‘Resource Use Efficiency in Cash Crops of Pune District’ examined the cost of production of sugarcane and onion. Using tabular analysis, the study found that per hectare cost of production of sugarcane was higher for small farmers. In the case of onion cultivation, medium farmers had incurred higher cost of production per hectare. The net return and cost C were found to be positive for all size group of farmers.

Banumathi\textsuperscript{35} in her study, “Economics of Production and Marketing of Cotton in Kamarajar District, Tamil Nadu” estimated the cost of cultivation of cotton between irrigated and rainfed farms. The study observed that the cost of cultivation in irrigated farms was higher than in the rainfed farms. Further, it was found that small farmers used higher quantity of human labour than the large farmers. Further, it was observed that the farmers cultivating cotton did not use cooperative marketing society and regulated markets and sold their product to village traders only.

Sannasi\textsuperscript{36} in his study, “Energy Requirements for Paddy Cultivation in Madurai District” revealed that in per acre input application, except mechanical power and all other inputs like human labour, bullock labour, fertilizer, pesticides, irrigation changes
and seeds was greater in the small farms than in large farms. Subsequently the cost could also show the higher level than the large farmers in the study area. Further, the gross return and net return earned by the small farmers were greater than the large farmers. The input and output ratio in terms of Cost A and Cost C were 1.97 and 1.37 for the small and 1.80 and 1.28 for the large farms respectively. Cost benefit ratio was 0.37 for small farms and 0.28 for large farms in the study area. Further, the small farm reaped higher benefit than the large farms. The multiple linear regression models showed that the inputs human energy, bullock energy and fertilizer energy were statistically significant at 5 per cent level. Among the inputs used in the cultivation of paddy human energy and bullock energy have been positively related and fertilizer energy has been negatively related to the per acre value of output energy in the study area.

Singh.B, Singh.P and Yadav\textsuperscript{37} in their study, ‘A Study on Marketing of Chillies in District Begusarai’ identified three different channels of marketing and worked out the price spread and farmers share of the customer’s rupee. They have found out that price spread indicated the presence of intermediaries in the marketing channels. They charged high margin of profit as compared to the service they rendered to the customers.

Renuka and Mohamed Iqbal Ali\textsuperscript{38} in their study, ‘A Comparative Analysis of Production and Productivity of Chillies: A Study in Command and Non-command Areas’ revealed that the production was not the same between command and non-command areas. The study also found that the productivity in command area was higher due to proper distribution of canal water. In command area, the per acre yield of chilli was
estimated to be 4.37 quintals in Area I and 5.91 quintals in Area II. In non-command area, the yield was found to be 4.13 quintals.

Shanmugam\textsuperscript{39} in his study, “Technical Efficiency of Rice, Groundnut and Cotton Farms in Tamil Nadu” analysed the economics of the cultivation of principal crops including cotton in the state of Tamil Nadu. The study found that land and labour were the significant determinants of the output of all major crops. Regarding the return to scale, the study revealed that all the parameters for all the crops showed a constant return to scale. The average technical efficiency of raising cotton was 73 per cent, which gave room for considerable improvement in the productivity.

Rama Rao, Chowdry, Reddy and Krishna Rao\textsuperscript{40} in their study, ‘Measuring and Explaining Technical Efficiency in Crop Production in Andhra Pradesh’ examined the levels of technical efficiency in the production of rice, groundnut and cotton. They concluded that the production of cotton would be increased by increasing the labour and fertilizer inputs at an optimum level.

Wadar and Koulagi\textsuperscript{41} in their study, ‘Constraints in Agricultural Production to Attain Economic Viability on Small and Marginal Farms’ assessed the farmers of northern Karnataka. They found that the small and large farmers exclusively depended on rainfed farming, but failed to achieve economic viability. In order to achieve economic viability the researcher suggested the promotion and development of agri-based and non agri-based subsidies to the agriculturalist.
R.L. Meena, R.K. Yadav and Khasanchi Lal in their study, “Growth, Yield Attributes and Seed Cotton Yields as Influenced by Intercrops and Nutrient Management under Saline Black Soils of Gujarat” experimented the intercropping of pulses and nutrient management in cotton grown on saline black soils of Gujarat in the year 2001-04. The result revealed that seed cotton yield data decreased significantly with inclusion of black gram as an intercrop as compared to sole cotton crop in two out of three years. It remained statistically on a par with clusterbean in all 3 years while with soybeens it was at par in three out of three years. A general decline in average yield with intercrop than sole cotton was noticed. It showed that cluster bean could be grown as an intercrop in cotton without much adverse effect on seed cotton yield. The results of nutrient management revealed that with each successive increase in nitrogen levels with basal application of 40kg phosphorous/ha, the seed cotton yield increased significantly up to 80 kg N/ha though the highest seed cotton yields were obtained with 100kg N/ha.

Bhatliprolu in his study, ‘Efficiency of Pseudomonas Fluorescens Against Bacterial Blight and Leaf Spot Diseases of Cotton’ conducted an experiment during rainy season of 2006-2009 to study the efficacy of Pseudomonas Fluorescens against fociar diseases of cotton at Regional Agricultural Reseach station, Lam, Guntur. Pooled data of 3 years showed that seed treatment with P. Fluorescens Pf 1 @ 10g/kg seed and folian spray at 0.2% at 30,40,50,60,70,80 and 90 days after showing gave maximum control of bacterial blight by 40.25 per cent, Alternaria leaf spot by 35.16 per cent Hermisssthosporium leaf spot by 50.5 per cent and Myrothecium leaf spot by 45.37 per
cent and recorded maximum yield of 1.46 tonnes per hectare against 1.19 tonnes per hectare in control. Highest benefit cost ratio of 1.92 was obtained with seed treatment with P.flourescens Pf 1 @10g/kg seed + 7 folian sprays @ 0.20 per cent at 30,40,50,60,70,80 and 90 days after sowing and seed treatment with P.flourescens Pf 1 @10g/1kg seed + 4 folian sprays @ 0.2 per cent at 30,50,70 and 90 days after sowing recorded 1.87 benefit: cost ratio as against 1.66 in 7 water sprays. The Pf1 a 10g/kg seed f7 folian sprays at an interval of 10days starting from 30 days after sowing in the cost effective technique in controlling the bacterial blight.

S.C. Srivastava, B.S. Gupta and H.P. Singh\textsuperscript{44} in their study, ‘Economic Analysis of Marketing of Soybean in Mandsaur District of Madhya Pradesh’ examined the price spread and market efficiency of soyabean. It was observed that the highest margin was charged by the retailer. Major constraints in the study area were lack of proper storage facilities, disorganised marketing malpractices in the market, lack of proper grading and packaging facilities, lack of processing limit in the study area and day to day fluctuation in the price of soyabean. Study concluded that there was immense scope for soybean processing industry and suggested that cooperative marketing societies should be promoted inorder to generate gainful income and employment in the study area.

R.S. Sidhu, M.S. Sidhu and J.M. Singh\textsuperscript{45} in their study, “Marketing Efficiency of Brinjal under Different Supply Chains in Punjab” had estimated the marketing cost and marketing margin of different functionaries for brinjal under various supply chains. Further they had analysed the price spread, marketing efficiency and farmers share in
consumers rupee in various supply chains. Further they studied the factors influencing
the marketing cost, margins and efficiency of Brinjal in Punjab state. Jullander district in
Punjab was selected as their study area. Convenient sampling technique was used. The
sample consisted of 93 farmers, 30 wholesalers, 30 retailers and 30 farmers from Apri
Mandi. Both primary and secondary data were used. Marketing efficiency was worked
out by using Acharya’s Modified Method. Cobb-Douglas Production function was
applied to study the factors affecting marketing efficiency. Best fit function was
determined by the value of coefficient of multiple determination ($R^2$).

Jayanand V. Hatti\textsuperscript{46} in his research article, “Cotton Growing Farmers in Their
Problems: A Case Study” analysed the problems of farmers in Dharwar District of
Karnataka. He selected 255 sample farmers randomly and also categorised farmers as
marginal, small, medium, and large farmers. He assessed the marketing conditions in the
cotton marketing and also analysed the production and marketing constrains in cotton
cultivation. The researcher found that the cotton was the major crop in the study area.
The farmers preferred the cotton due to its suitability to rain fed situation and its high
yield. The average cotton yield was highest at 8.40 quintals per acre in the study area.
Cost of fertiliser was the major input cost. Cotton picking activity consumed nearly 1/3
of the total labour of cotton cost. With regard to marketing cost, commission and
marketing fee were the major items. Of the total cost of cultivation labour cost was the
major cost item. Gross returns, Net returns Cost A and at Cost B are high for
medium/large farmers. Cost benefit ratio is also higher for these farmers.
Anil Bhat, Jyoti Kachrao and Dileep Kachrao in their study, ‘Economic Evolution of Production and Marketing of Lemon in Kathuna District of Jammu and Kashmir State’ made an indepth analysis of cultivation of lemon by studying its costs and returns, economic viability as well as its marketing efficiency. The establishment costs per acre in the first year worked out to be Rs.3821.59 while as the total establishment cost was Rs.9563.54. The operational costs, that is, Cost A, Cost B and Cost C worked out to be Rs.816.77, Rs.2579.71 and Rs.3268.04 respectively. As far as returns were concerned, overall per acre per year return was Rs.10475.36. The average per quintals marketing cost borne by the retailer was Rs.28.65 and Rs.18.75 in Channel I and II respectively, and in Channel III the marketing cost was borne by producer as there was direct marketing for produce. A comparison of price spread through different marketing channels revealed that producer’s share in customer’s rupee was the highest (about 81.99 per cent) in Channel III. It was due to self sale in the local market where marketing cost very low. The marketing efficiency was found to be highest in Channel III.

G.S. Buttar, S.K. Jalota, Anil Sood and Bharat Bhushan in their study, ‘Yield and Water Productivity of Bt Cotton as Influenced by Temperature under Semi-Arid conditions of North – Western India: Field and Simulation – A study’ considered that the cotton cultivation in semi – arid region was the most risky crop and its yield was very sensitive to weather parameters like rain and temperature. The result showed that with an increase in temperature from 28 to 32°C cotton seed yield was reduced to half from 4700 to 2300 kg/ha. Relationship with cotton seed yield was linear with total evap-
transpiration and quadratic with total water supply (rain+irrigation). Real crop water productivity (yield/ET) and apparent crop water productivity were $0.362 \pm 0.129$ and $0.485 \pm 0.120 \text{ kg/m}^3$ respectively.

V.R. Farkade, S.A. Choudhari, A.J. Amale and S.N. Tilekar\textsuperscript{49} in their study, ‘Economic Analysis of Production and Marketing of Soybean in Vidarbha Region of Maharastra’ found that the benefit cost ratio of cost $c$ was 1.89 for soybean cultivation for overall farmers. The ratio was the highest in large size crop followed by small size groups. Among the various marketing channels 53.0 per cent of their produce marketed through Channel III, 30 per cent through Channel II and the remaining 17 per cent through Channel I. The producer’s share in consumer’s rupee did not vary much from across the identified channels. The marketing efficiency were 1.13, 1.12 and 1.15 per cent for Channel I, II and III respectively more or less average across the three channels.

D.S. Navadkar, A.J. Amale, C.M. Gulave, and V.M. Mannaware\textsuperscript{50} in their study, ‘Economics of Production and Marketing of Kharif Maize in Ahmednagar District of Maharastra State’, attempted to study the resource use structure to estimate the cost of cultivation and to study the marketing of maize. In all 90 farmers were selected from Kajrat tahsil of Ahmednagar district in western Maharastra. The data related to the agricultural year 2008-09 was taken for the present study. The sample farmers were classified into three size groups namely small, medium, and large. The Cobb-Douglas production function was used for functional analysis. The findings of the study showed that in the Channel I, the major component of marketing cost was commission charges
with 50.66 per cent followed by expenditure on packaging charges with 25.27 per cent and transport with 19.68 per cent. In the Channel II the major components of marketing costs were packing with 84.63 per cent and transportation with 10.74 per cent. The producers share in consumers rupee were 78.26 per cent and 73.19 per cent in Kajrat and Ahmednagar market respectively. In Channel I, the marketing efficiency of Kharif maize in Ahmednagar market was 1.13 and in kajat market was 1.11. In channel II, the marketing efficiency at local market was 1.10. So, Ahmednagar was efficient for marketing of the maize. The estimates of the production function indicated that human labour, manures and nitrogen are the important resource variables responsible for increasing the yield.

Agro Economic Research Centre\textsuperscript{51} for Bihar and Jharkhand with T.M. Bhagalpur University conducted a study on the “Impact of Emerging Marketing Channels in Agricultural Marketing of major Agricultural Commodities in Bihar and Jharkhand”. The reference crops for the study were mango and cauliflower. The size of the sample in each state was 100 households. Besides, farm households other market players and consumers were found included in the sample. It constituted buyers/traders (05), retailers (15) and consumers (15) on Traditional Marketing channel category and buyers (05) and consumers (15) on Emerging Marketing channel category in each state taking together 30 and 20 on TMC and EMC group in each state. The result showed that in Bihar the cost benefit ratio’s were 1:2.56 and 1:2.98 on TMC and EMC farms respectively. It revealed that the returns were higher on EMC farms over TMC farms.
2.2. DATA AND METHODOLOGY

In this section an attempt has been made to study the methodology which includes the choice of the study area, period of study, sampling technique, the procedure for collection of data, analytical tools used and the concepts used in this study.

2.2.1. Choice of the Study Area

Virudhunagar District is an industrial hub, which is selected for the study of cotton cultivation for the following reasons

a). The unique feature of its soil, namely black soil.

b). The prevailing suitable temperature.

c). The cluster of many more leading cotton textile industries.

d). Favourable marketing potentiality for the crop.

e). Availability of infrastructural facilities.

2.2.2. Period of the Study

Primary data relating to cotton cultivation were collected during the period of January - April, 2012 normally after the harvesting period. The reference period of the survey was 2011 – 2012.

2.2.3. Sampling Technique
For in-depth investigations, a sample of 300 farmers was chosen using multistage proportionate random sampling technique in this study. In the first stage, the district with highest area under cotton cultivation in Tamil Nadu during the reference period, namely, Virudhunagar District has been purposively selected as universe. Secondly, out of the eleven blocks in the district four blocks namely Aruppukottai, Kariapatti, Thiruchuli and Virudhunagar were selected for the study as the cotton cultivation was mostly concentrated in these blocks. At the third stage, seven villages from Aruppukottai, six villages from Kariapatti, four villages from Thiruchuli and three villages from Virudhunagar blocks totally 20 villages were proportionately selected based on the area of cotton cultivation in these blocks. Finally a sample of 300 farmers, 109 from Thiruchuli 89 from Aruppukottai, 57 from Kariapatti, and 45 from Virudhunagar blocks were randomly chosen. In each village around 15 sample farmers were selected for the present study. The area under cotton cultivation under 11 blocks is presented in Table 2.1
TABLE – 2.1

BLOCKWISE AREA UNDER COTTON CULTIVATION IN VIRUDHUNAGAR DISTRICT

<table>
<thead>
<tr>
<th>Name of the Block</th>
<th>Area Under Cotton Cultivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LRA5166</td>
</tr>
<tr>
<td>1 Aruppukottai</td>
<td>1651.455</td>
</tr>
<tr>
<td>2 Kariapatti</td>
<td>1065.910</td>
</tr>
<tr>
<td>3 Narikudi</td>
<td>9.985</td>
</tr>
<tr>
<td>4 Rajapalayam</td>
<td>-</td>
</tr>
<tr>
<td>5 Sattur</td>
<td>154.73</td>
</tr>
<tr>
<td>6 Sivakasi</td>
<td>222.895</td>
</tr>
<tr>
<td>7 Srivilliputhur</td>
<td>-</td>
</tr>
<tr>
<td>8 Thiruchuli</td>
<td>2040.255</td>
</tr>
<tr>
<td>9 Vembakottai</td>
<td>-</td>
</tr>
<tr>
<td>10 Virudhunagar</td>
<td>847.345</td>
</tr>
<tr>
<td>11 Watrap</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 2.1. shows that majority of the farmers were cultivating more LRA- 5166 variety than MCU-5 variety. Hence the choice of the LRA- 5166 variety of cotton for the present study. Further, on the basis of the size of the area of cotton cultivation the following four blocks of larger cotton cultivation have been selected for the study.


From the above four blocks 20 villages were proportionally selected based on the area of cotton cultivation. Table 2.2. presents the villages selected for the study and the number of sample farmers selected from each village.

**TABLE – 2.2**

**NUMBER OF SAMPLE FARMERS SELECTED**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of Block and villages</th>
<th>Area under cotton cultivation</th>
<th>Number of Sample Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Tiruchuzhi</strong></td>
<td>2040.255</td>
<td>109</td>
</tr>
<tr>
<td>i.</td>
<td>Kambikudi</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>ii.</td>
<td>Pannaimoonradaippu</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>iii.</td>
<td>Maravar Perunkudi</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>iv.</td>
<td>Kallumadam</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>v.</td>
<td>Reddiapatty</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>vi.</td>
<td>Kullampatti</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>vii.</td>
<td>Kallorani</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Area</td>
<td>Population</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Aruppukottai</td>
<td>1615.455</td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>Chettikuruchi</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Soolakarai</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Puliampatty</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Puliooran</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Andipatti</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Koothiparai</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

| 3 | Kariapatti | 1065.910 |
| i | Kurandi | 15 |
| ii | Thonukal | 14 |
| iii | Alaginallur | 14 |
| iv | Vakkanankundu | 14 |

| 4 | Viruthunagar | 847.345 |
| i | Kottaiyur | 15 |
| ii | Thammaraiickenpatti | 15 |
| iii | Kottanatham | 15 |

| Total | 5604.965 |


Primary data as well as Secondary data were collected for the present study. In order to collect primary data, a well designed questionnaire has been drafted. The questionnaire is the media of communication between the investigator and the
respondents. The success of the data collection depends on the effective construction of the questionnaire. A comprehensive, thoughtful and result oriented questionnaire demands greater attention and diligence on the part of the researcher the following points are borne in mind while draftly questionnaire.

- Questions should be brief.
- Questions should be simple to understand.
- Questions should be arranged logically.
- Questions are framed in multiple choice pattern.
- Proper words should be used in each questions.
- Sensive and personal nature questions are to be avoided.
- Mathematical calculation questions are to be avoided.

After drafting the questionnaire, it was administered to 10 persons covering a cross section of people in the study area to test the validity of questionnaire. The pre-test facilitated the removal of non response and unwarranted questions and the modified final questionnaire was prepared on that basis.

Direct personal interview method was adopted to collect the data related to the area of cultivation, cropping pattern, cost structures in farming operations and in marketing fields and other related aspects relating to the overall objectives of the study.

Secondary source of data relating to location, climate, soil type, utilization of land pattern, operational holdings, demographic features, sources of irrigation, net cropped
and gross cropped area, area under production and yield of major crops, livestock census, infrastructural facilities and the like were collected from Assistant Director’s Statistical Office, Government Publications, G-Return Particulars and from village records like adangal and chitta.

Human bias in recalling the memory is an eternal problem with all. In direct personal interview method, chances of being bias are more. An untrained investigator will not bring good results. Sometimes the investigator collects information according to the convenience of the informant. In order to overcome such defects as far as possible, cross checks were entertained in the questionnaire itself to elicit correct information. Further, to get reliable data from the respondents efforts had been taken in the following ways.

- The researcher explained clearly the specific purpose of the study to the respondents.
- The researcher approached the sample respondents amiably to win their confidence.
- The researcher cleared the doubts raised about the present enquiry.
- Even though, questionnaire was framed in English, the questions were asked only in Tamil, the local language, while conducting the interview by the researcher.
The collected data have been classified and computed according to the requirement of the study. Appropriate tools have been used to analyse the data. The results have been interpreted and the observations relevant to the study have been made.

2.2.4. Methods of Analysis:

In order to achieve the objectives of the present study, 300 sample farmers have been grouped into two categories namely, small and large farmers. In order to test the homogeneity between small and large farmers two way Analysis of Variance Technique has been used with respect to the per acre production of cotton in the study area. The result of the ANOVA is presented in Table 2.3.

### TABLE 2.3

**TWO WAY CLASSIFICATION OF ANOVA**

<table>
<thead>
<tr>
<th>Sources of Variation</th>
<th>Sum of Squares</th>
<th>Degrees of</th>
<th>Variance Ratio</th>
<th>F Value</th>
<th>F₀.₀５</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Farms (Column means)</td>
<td>SSC 1854256</td>
<td>c-1 1</td>
<td>MSC = SSC/C-1 = 1854256/MSE</td>
<td>14.62</td>
<td>10.13</td>
</tr>
<tr>
<td>Between villages (Row means)</td>
<td>SSR 7397999</td>
<td>r-1 19</td>
<td>MSR = SSR/r-1 = 389368.4/MSE</td>
<td>3.07</td>
<td>4.38</td>
</tr>
<tr>
<td>Error</td>
<td>SSE 2409772</td>
<td>(c-1)(r-1)</td>
<td>MSE = SSE/(c-1)(r-1) = 126830.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2.3 shows that the calculated value of F is greater than the table value of $F_{0.05}$. So it is inferred that there exists significant difference between small and large farms in the study area. But in the case of villages, the calculated value of F is less than the table value of $F_{0.05}$. So there is no evidence of significant difference existed between villages in the study area.

So the researcher has grouped the sample farmers as ‘small’ and ‘large’ for his analysis.

2.2.5. Tools of Analysis

The following tools have been used in the present study.

Input output ratio and cost benefit ratio are used to find out the cost and return structure for sample respondents.

Farm efficiency has been measured with production efficiency and financial efficiency.

Log Linear Model has been used to find out the determinants of per acre production of cotton in the study area.

By using Geometric Mean Values, Marginal Value Productivities are calculated in order to find out the resource use efficiency.
Chow’s Test has been performed to test whether there exists a structural difference between small and large farms. To find out whether the structural difference exists either at intercept level or slope level or at both levels multiple linear regression model with dummy variables have been used.

“t” test has been employed in order to test the differences in the usage of inputs between small and large farms.

\[
T = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}
\]

Where,

\(\bar{X}_1\) = Mean value of the small farm.

\(\bar{X}_2\) = Mean value of the large farm.

\(S_1\) = Standard Deviation of the small farm.

\(S_2\) = Standard Deviation of the large farm.

\(N_1\) = Total number of small sample farms

\(N_2\) = Total number of large sample farms.

Marketing efficiency is measured with the help of Acharya’s and Sundaravarayan’s method.

2.2.6. Concepts Used in the Study

The following concepts have been used in the present study.
2.2.6. 1. Human Labour

An adult man who has toiled his eight hour work in agriculture and related operations has been termed human labour.

2.2.6. 2. Woman Labour

An adult woman who has worked in agriculture and related operations to the extent of eight hour has been termed woman labour. The woman labour in this study is equated to half of the human labour.

2.2.6. 3. Fertilizer

Fertilizer refers to the actual amount applied in kilograms in the form of Nitrogen, Potassium and Phosphate in the present study.

2.2.6. 4. Farm Yard Manure

The available cow dung and agricultural waste in tones were termed farm yard manure.

2.2.6. 5. Seeds

Purchase of cotton seed in kilograms is considered as seed.

2.2.6. 6. Pesticides

Pesticides and insecticides are referred by the amount used in liters or in kilograms, that are sprayed to protect the crop from pest menace in the study area.
2.2.6.7. Irrigation

Irrigation refers to the water drawn from the public irrigation or own wells or both to irrigate the cotton field. It is measured in terms of hours.

2.2.6.8. Mechanical

The actual time period hired for tractors, power tillers and other machinery like spraying is referred to as mechanical power.

2.2.6.9. Interest

Interest is calculated for working capital which was simply the average interest rate of 18 per cent that prevailed in the study area. It is measured in rupees.

2.2.6.10. Working capital

Cost on different inputs put together is termed as working capital. It includes interest.

2.2.6.11. Farm size

The extent of land actually cultivated by the sample respondents during the reference period is termed as farm size. It includes the own land, and the leased in land under cultivation by the farmer.

2.2.6.12. Small Farmers

It refers to those farmers whose net cultivated area was less than 5 acres.
2.2.6. 13. Large Farmers

It refers to those farmers whose net cultivated area is five and more than five acres.

2.2.6. 14. Net Cultivated Area

The actual intent of land under cultivation by the farmer either owned or leased in is termed as net cultivated area.

2.2.6. 15. Gross cultivated area

It has been termed as the sum on net cultivated area and the area sown more than once.

2.2.6. 16. Yield

The physical quantity of cotton produced in kilogram is termed as yield.

2.2.6. 17. Rent

The prevailing rate in terms of rupees for the use of land during the reference period is considered a rent.

2.2.6. 18. Other Cost

The expenses incurred in depreciation in term implements, interest on permanent capital structures excluding the land less and revenue and the incidental expenses incurred during agricultural operations are treated as other costs.

2.2.6. 19. Gross Revenue

The market value of physical output of cotton is termed as gross revenue.
2.2.6. 20. Net Revenue.

The difference between gross revenue and cost A has been termed as net revenue.

2.2.6. 21. Marketing Margin

The difference between the producer’s selling price and purchase price by the consumer is termed as marketing margin.

2.2.6. 22. Price Spread

It refers to the difference between the price paid by the consumer and the price received by the producer. The price spread involves not only the ascertainment of the actual prices at various stages of marketing channel, but also the costs incurred in the process of the movement of the produce from the farm to the consumer and the margin of various intermediaries.

2.2.6. 23. Supply Channels

Supply Channel will also be termed as marketing channels. Supply channels are routes through which agricultural produces move from producers to consumers.

2.2.6. 23. Intermediaries

Intermediaries are those individuals or business concerns which specialize in performing the various marketing functions and rendering such service as are involved in the marketing of goods.

2.3. LIMITATIONS OF THE STUDY

The following are the limitations of the present study.
The study area is confined to only one particular area. The situation differs from region to region. So generalization of results based on the results of the study may or may not suit.

The awareness on the part of farmers in the study area is lacking. So the chances of recall bias among the respondents may be greater. Hence the collected data will not represent a true picture about the present study.

The literacy of the respondents are very low. Since the present study mainly depends on primary source, chances of human bias in maintaining accounts for their expenditure in cotton is questionable. So, the respondents do not reveal their statement of accounts correctly and properly.

REFERENCES


M.Phil Dissertation Submitted to Madurai Kamraj University, Madurai, PP.61-90.


CHAPTER – III

PROFILE OF THE STUDY AREA AND CHARACTERISTICS OF
THE SAMPLE RESPONDENTS

This chapter discusses the profile of Virudhunagar District in general. To meet the purpose, particulars regarding location, physical features, climate and rainfall, soil type, utilization of land and operational holdings, demographic features, sources of irrigation, area irrigated sourcewise, gross area irrigated, area under major crops, production and yield of major crops, livestock census, infrastructural facilities like transport and communications, major hospitals, electricity availability, financial and educational institutions, marketing facilities and the like have been collected and analysed. Further, the socio economic characteristics like age, sex, religion, educational status, caste, income level, number of the family members involved in cotton cultivation of the sample respondents have also been collected analysed.