Chapter II
Chapter II – REVIEW OF LITERATURE

This review of literature relating to the study is organized on the following basis; first, the literature on macro level agricultural changes and the impact of policy measures are studied. Next, the studies on evaluation of agricultural production, productivity and technological changes are explored. Thirdly, issues relating to credit policy and previous studies on the implications of credit structure are studied. Fourthly, the literature on agricultural wages, labour absorption and the employment dimensions of agricultural economy are studied. Finally, the literature on specific village studies undertaken in Tamil Nadu since 1984 have been studied to understand the evolving agrarian economy in the State.

2.1 Macro Economic Changes in Agriculture and Policy Measures

Boston (1996) analyzing the declining share of agriculture to GDP since independence said that to maintain the growth rate of the economy above seven per cent, the agricultural sector had to growth at above four per cent growth rate per annum. On the implementation of land reforms in the country, he noted that just over one per cent of cultivable land in the country had been redistributed through land reforms that too mostly confined to Kerala, West Bengal and Tripura.

Chandrasekar and Ghosh (2006) said that the agricultural crisis became pertinent in the context of growth in non-agricultural economy and also a rapid raise in the GDP. They noted growing decline in food consumption squeezed by the requirements of health, fuel and education further aggravated by collapse of public provision. On the agricultural crisis and agrarian distress, they found that the agricultural growth rate declined from 1981-91 to 1991-2001.
Sengupta et al., (2004) analysed the agrarian growth process among different States in India. They found that the rate of growth of cropped area was diminishing in many parts of the country during 1950 to 1999. They noted lack of convergence in agricultural productivity and spread of modern technological know-how across all states and all crops except for wheat and rice. Sengupta et al., concluded that the new agricultural policies and liberalization failed to enhance welfare-oriented growth in general and particularly so for laggard states in the country.

Fan et al., (2000) found drastic reduction in government spending on roads, education, research and development (R&D) and irrigation during the period of 1990s. They found that government spending on productivity enhancing investments contributed significantly to reduce rural poverty and also to increase agriculture productivity. They were of the view that increased spending on rural infrastructure, R&D and education contributed to further reduction in rural poverty.

Etienne (1998) argued that the investment in Indian agriculture was not rising during the 1980s. The increase in the private investment could not compensate for the fall in the public investment. Etienne considered that there was a major threat to agriculture because of the setback in investments, which started in 1980s. Deceleration in the agricultural sector in general and declining growth of foodgrains in particular took place from the end of the 1980s onward. Emphasizing the importance of irrigation expansion as the basic requirement for agricultural development, the author advocated larger public investment for improving drainage and flood control measures, besides appropriate watershed development projects.

Mujumdar (2001) stated that average annual agricultural GDP growth in value added terms declined from 3.5 per cent during 1980s to 2.8 per cent in 1990s. The minimizing of government intervention resulted in decline of
poverty alleviation programmes, he said. He noted that along with decline in subsidies, the small and marginal farmers could get credit at only 14 per cent rate of interest whereas Multi National Companies (MNCs) got credit at 4 to 5 per cent interest from the banks. He stated that, besides the decline in public expenditure in agriculture, rural employment also suffered during the economic reforms period. In his view, 1990s was a ‘lost decade’ for agriculture due to shrinkage of flow of resources to agricultural sector. On the food policy, he stated that the mountain of surplus foodgrains of 60 million tonnes stood as a monument of misguided food policy and also of macro economic mismanagement.

In his analysis based on National Sample Survey Organisation estimates, Mishra (2007) stated that 40 per cent of Indian farmers did not want to continue their profession due to poverty. He was of the opinion that the inadequate income from agriculture if it were to continue would lead to more suicides in other areas of the country. He identified shortfall accentuated due to crop loss, market uncertainties and additional family expenditure where the causes of decline in agricultural income. The author considered intervention in credit market to reduce the dependence on informal sources of credit was very urgent in our agriculture. He said that the farmers needed a strong support and the mass of agricultural labourers dependent on farmers required even more support to enhance their livelihood. In this regard, additional employment opportunities at village level with appropriate wages was required, according to Mishra.

Savant and Mhatre (2002), based on the agriculture ministry’s All Crop Production Index (ACPI) and Central Statistical Organisation’s gross value of output, estimated the comparative performance of agriculture in 1990s and in 1980s. As per the ACPI, they found that the growth rate of agriculture declined from 3.33 per cent in 1980s to 2.38 per cent in 1990s; they also found that the
decline in production growth was larger in cereals, pulses and oilseeds. They stated that India's agricultural crop growth was influenced by price-induced crop diversification towards crops other than foodgrains and oilseeds; the depressed relative prices and deterioration in non-price factors such as infrastructure, irrigation and technology caused deceleration in the production of foodgrains and oilseeds. They further noted that it was difficult to sustain agriculture if the trend were to continue in the long run.

Hirashima (2000), observing that the inter-state disparities in terms of yield level and asset were substantial, considered that diversification of public investment in underdeveloped regions was required; the potential for enhancing productivity was high in such regions.

Sharma (2004) found that poor farmers in developing countries were forced to face the vagaries and cruelty of the markets while the rich countries had perfected well-established state intervention programmes to ensure that their farmers got the minimum level of income; markets, therefore had no meaning for the farmers of developed countries. He also stated that a farmer in a developing country, who cropped different varieties without subsidy, would face serious threat or may commit suicide at the time of price downslide of his products; on the other hand, a farmer in a developed country would not feel the price decline because of government subsidies. He felt that Indian farmer did not receive any green box subsidy and advocated that the G-20 countries should strive to bring the green box subsidies to zero before initiating any meaningful talk on agriculture.

Jhunjhunwala (2003) writing on the exports of India stated that efforts were to be taken to increase the export of value added agricultural products (flowers and processed foods) where the labour content was large and resource content was small; on the other hand, exports of resource-intensive products
such as sugar and wheat should be discouraged according to him. He said that there was a need to get out of the 'exporting our way to prosperity' syndrome wherein it was advocated that India should increase its exports even if it involves transfer of resources at lower prices.

Bhalla (2003) in his study found that the slow down in public investment in agriculture caused decline in development of rural infrastructure; inadequate replacement of private capital not compensated by required public investments in agriculture; decline in research and extension activities led to deceleration in the growth of agricultural yield; the increasing dependence on MNCs for seeds and related consultancies caused harm to agriculture; slowdown and capitalization in agriculture caused labour surplus which the non-farm sector was not able to accommodate; removal of trade restrictions on import of agriculture products led to general decline in their prices accounting for decline in income earned by Indian farmers; the capitalization of agriculture and facilitation for the entry of MNCs led to a gradual freeing of lease market causing changes in the institutional structure of the village economy in the country.

Behera and Mishra (2007) advocated strengthening of micro and macro level institutions to bring out the problems in input markets and also assist the farmers to market their produce at right price. They suggested the starting of group farming, Self-Help Groups (SHGs) and Panchayat Raj Institutions (PRIs) to empower the farming communities. They further stated that the deceleration in agricultural growth rate was not only because of policy fatigue but also due to institutional fatigue.

Dandekar (1994) was of the opinion that 'reverse land reform' of raising the land ceiling and liberalization of the lease market emerged as a policy option in agriculture in the 1990s. He said that the supporters of such policy
direction saw the advantage of economies of scale and efficient use of land resources.

Rao (2003) on the required reforms in agriculture stated that application of cost reducing technologies, reduction of rural poverty and inequalities among farmers, protection of environment by prevention of degradation of land and water along with increase in non-farm employment opportunities in rural areas were required.

Thamarajakshi (1999) stated that while the increase in gross capital formation (GCF) was 46 per cent in the reform period over the pre-reform period, the corresponding figure with reference to agriculture was less than 36 per cent. Similarly, the private sector GCF for non-agriculture (74 per cent) was higher than that of agriculture (58 per cent). She noted that public spending for irrigation declined during the plan period since 1980. On increase in area under major and medium irrigation (2.1 million hectares), which she considered as stagnant compared to the pre-plan period, she noted that area under ground water irrigation increased in relative terms.

Narayanamoorthy (2002) found that despite significant increase of investment on major and medium irrigation since 1980, area under canal irrigation decelerated during this period. Tank irrigation, cheapest source of irrigation, had declined continuously in terms of absolute area and in relation to gross irrigated area. The costliest irrigation source, groundwater irrigation, had increased tremendously after independence and emerged as the dominant source at present. The current water use efficiency, according to Narayanamoorthy, was very low and required improvement.

Mishra (2008) on the prevailing agricultural crisis in India stated that excess people depended on agriculture while non-farm employment declined in
the country; there was increase in small and marginal holdings (63 per cent as per 2000-01 agricultural census) and decline in agricultural income.

Mishra (2008) further explained that the production loss in crop adversely affected the consumption pattern of farmer households; he also noted that the low income made it difficult to continue cultivation in the subsequent period and farmers were not able to meet usual social obligations such as education, health, marriage, etc.

Meeta (2008) commenting on the agricultural scenario in 2008 found the following reason for current distress of farmers in India; competition and exploitation by big capital and its minions; non-availability of formal loans for farming operations; fragmented holdings of an unviable economic size; lack of research in new methods of farming; inability of government channels to provide required services to farmers. He was emphatic that the write-off of farm loans was self-defeating. The government should ensure direct and consistent flow of financial assistance to farmers.

According to Meeta (2008), difficulties in marketing of their produce made farmers less interested in dry land farming. He urged that the government should help the farmers in providing more information about market, new technologies, market access and importance of storage.

In the context of capitalist agriculture, Dasgupta (1980) found that it was not favoured by poor farmers who had no control over the market especially when the output exceeded their household subsistence needs. This, according to Dasgupta, made the farmers as price takers. According to the author, as long as the poor farmer remained as a price taker there was the risk of making less money from a bigger output.
Satapathy and Tripathy (2001) found that using modern technologies needed more working capital. Both small and marginal farmers spent larger percentage of total loan amount on fertilizer and manure, followed by plant protection chemicals, form machinery, seed and miscellaneous items. Due to the relatively better financial condition, the small farmers spent more amounts from their own sources than marginal farmers. They found that per hectare yield of rice was higher on borrower farms as compared to the non-borrower farms, because the credit recipients used optimum level of resources.

Mathew (2003) found agriculture in Tamil Nadu more efficient among southern States and noted that Tamil Nadu accounted for highest yield in the country in jowar, bajra, groundnut and sugarcane in 2001, besides being the second highest yielding State after Punjab in rice. As the state with the highest irrigated area among the southern states, Tamil Nadu experienced decline in public expenditure in agriculture (28 per cent) in 1990s compared to 1980s (42 per cent). Mathew found that though the private sector investment in agriculture partly compensated the fall in public sector investment, the developments were confined to minor irrigation measures such as tube wells and pump sets. This was in contrast with the investments made in medium irrigation in the form of canals and tanks by this public sector in the previous period. Mathew also noted that the decline in employment in agriculture in Tamil Nadu was more than that of other States.

Himansu (2003) found that the composition of income of rich in rural India changed with non-agricultural sources accounting for a larger share than before. In Tamil Nadu, population pressure had caused a wide level of land fragmentation and converted many of the rural rich to middle and small farmers. The National Sample Survey Organisation (NSSO) data, according to Himansu, revealed that the diversification of rural rich in Tamil Nadu into non-agricultural sector was also considerable.
The above discussed review of literature on the macro economic changes in agriculture brings to the fore the following: The agricultural growth rate which was above three per cent in 1980s declined to marginally above two per cent in 1990s; the decline in production growth was larger in cereals, pulses and oilseeds. The slowdown in public investment in agriculture and rural infrastructure contributed to deceleration in agricultural yield. Therefore, the declining growth of agriculture which started in mid-1990s has caused agricultural crisis in the economy. Thus, policy fatigue and institutional fatigue caused decline in agricultural growth. The inadequate income from agriculture made many farmers to discontinue agriculture and also affected their consumption pattern. The net impact was larger instability in the agricultural sector and decline in the share of agriculture to (GDP).

On agriculture in Tamil Nadu, which has the highest irrigated area among southern states, there had been decline in public expenditure in agriculture in 1990s; the private sector investment was confined to minor irrigation measures only. Tamil Nadu also experienced more decline in employment in agriculture than other states.

The following discussion of review of literature relates to specific changes in Indian agriculture in the last 25 years.

Maheshwari (1996) identified two phases of the ‘green revolution’ (GR) with the first phase (from mid-1960s to late-1970s) showing increased growth and the next phase (early 1980s to present) in which the growth was stagnant or lower than in the past. She also noted regional variation in the above mentioned pattern. In her view, while there was overall increase in the area under crops, the second phase revealed significant decline in area under foodgrains barring paddy. The stagnation in foodgrains production in the second phase of GR was
because of the less than required package of practices followed with reference to new technologies.

In his estimation of growth of all crops after GR, Ghosh (2002) came to the conclusion that other than wheat, the growth rates were not very impressive. Dividing the period from 1962-1995 into three different segments, Ghosh derived the following findings; the first period of GR (1962-73) was mainly confined to wheat in wheat growing states; the second period (1970-83) related to the rice producing states; the third period (1983-95) denoted a turning point in India’s agricultural development, wherein the HYV technology permeated to all the regions of India.

Dantwala (1996) identified increase in cereals production, similar trends in fertilizer consumption, entrepreneurial motivation to progressive farmers, use of short duration maturity seeds, upsurge in utilization of groundwater as the positive trends of GR in the 1980s.

Radhakrishna (2002) said that GR changed agriculture from tenant to owner cultivation and farm mechanization in the GR regions affected the process of labour migration. He also stated that, during the economic reforms period of 1990s, agriculture was bypassed.

Arya and Mathur (1997) stated that the inability to adopt new technology and improved agricultural practices in small size landholdings caused variations in land productivity at regional and inter-regional levels. The very low capital resource base of small farmers and their limited capacity to undertake risk in agricultural production made the farm research and promotional measures less effective in providing the small farmers higher welfare gains.
On the new agrarian technology, Dasgupta (1980) noted that modern technology received more response from areas wherein fertility of soil was high and there was already some emphasis on use of technologies; the cost of these technologies limited the use of modern technologies in different parts of the country. He was of the view that GR was more than a package of inputs incorporating a set of new agricultural practices. The new technology followed a new crop calendar with the use of short period new varieties creating the possibility of multi-cropping. Moreover, the capitalist mode of agriculture made the farmer dependent on the market for supply of new seeds, fertilizers, pesticides, increased labour for harvesting, etc. He stated that new seeds would not achieve full potential without water and fertilizer. In the context of Indian agriculture been exposed to the risk of gigantic crop failure at times of epidemics, Dasgupta was of the opinion that heavy application of fertilizers for HYV seeds encouraged growth of weeds.

Roy (2008) considered that corporatisation of agriculture, hybrid-led use of biotech and current intellectual property regime were not fit for Indian agriculture. He was of the view that these factors threaten potential food security in the way of restricting farmers’ experiment and undercutting local practices. The author held that by converting areas of agrarian crisis into special agricultural zones and by extending centralized services to small-scale production, the livelihood of farmers would be saved.

Tracing the history of production of pesticides in India with BHC and DDT in 1952, Padmanaban (2002) stated that India was the second largest pesticide consuming nation in South Asia next to Japan and 12th in the world. He noted that the pesticide market in India was dominated by insecticides (77.80 per cent) while the corresponding figure in the world was 36 per cent. The author found that the pesticide use at farm level was influenced by the marketing techniques of pesticide companies.
In their study on the relationship between irrigation and agricultural productivity, Vaidhyanathan et al., (1994) proceeded to compare the yield in higher irrigated and rainfed lands. They found the mean yield higher in irrigated and high rainfall areas compared to the rainfed areas. According to the authors, irrigation changed nature, composition and degree of concentration of crops; paddy, oilseeds and cotton the largest crops in irrigated areas of Tamil Nadu accounted for a higher proportion of gross irrigated area than other crops. The authors found that in irrigated areas of Tamil Nadu, cropping intensity was higher in areas with relatively high proportion of irrigated land under wells. They noted that larger dependence on tanks was likely to lower the irrigated cropping intensity. On the inter-district variations, they found that crop diversification was less in rainfed areas except Coimbatore district where higher diversification was seen in both irrigated and rainfed crop patterns.

Etienne (1998) identified three factors namely renewal of seeds at the right time, better balance of chemical fertilizers and better pest control as being required in Indian agriculture. Emphasizing the renewal of seeds, he noted that the actual replacement rate was low because of the neglect of farmers and also the inadequate operations of seed multiplication farms.

Sen (2003) found that the higher yield growth and price led to increase in the margin per hectare of gross value of agricultural output during the 1980s; the yield growth slowed down in 1990s and prices of produce other than sugarcane and cereals rose more slowly than the cost of living; the cost margin declined for most of the crops. As a consequence of falling profitability, there was deceleration in the rate of growth of private real capital stock in agriculture.

Veronique (1999) noted that the rice culture made the farmers to give less preference to other crops such as cotton despite their higher return. The
farmers believed that rice is a socially important foodgrain and price fluctuations were only temporary in nature. She was of the opinion that food security dominated crop choice along with institutional, social and political factors. On subsidies, she found that a slight cut in fertilizer subsidy and increase in power tariff drastically reduced the returns from cultivation. The decisions taken by the state regarding irrigation, canal maintenance and water management considerably influenced the cultivation practices of the farmers.

Janaiah et al., (2003) studying villages in Chhattisgarh region found that income derived from rice production was 52 per cent higher in irrigated region than rainfed region; an outcome of technological progress and irrigation intensification. In irrigated areas, the share of capital inputs in total value of input was relatively higher due to capital intensive inputs, such as pumpsets, fertilizers and machineries, than in the rainfed regions. They were of the view that the modern technology made a significant impact on the productivity of rice in both irrigated and rainfed ecosystems. They also found that the yield growth rate of rice slowed down under the irrigated ecosystem and picked up in rainfed ecosystem during the late GR period. The authors attributed the increased adoption of modern varieties in the late 1980s in rainfed areas as the reason for this trend.

Janaiah et al., (2000) found the application of technology-intensive cultivation methods, higher productivity of land and total household income in irrigated eco-system than rainfed areas. They considered creation of non-farm employment in rainfed areas to minimize the household income inequalities between the two eco-systems. They also suggested effective land reforms for redistributing surplus lands and suitable technology for rainfed agriculture to improve the farm economy in rainfed areas.
Narayamoorthy (2001) found that there was strong inverse relationship between level of irrigation and poverty level among the rural population and concluded that the expansion of irrigation could substantially reduce poverty among the rural mass in India.

Vaidhyanathan and Sivasubramaniyan (2004) were of the view that better water management which determined the area of irrigation, cropping intensity and irrigation efficiency provided for agricultural growth. They noted that the area under irrigation in Tamil Nadu was actually higher than reported in the official statistics; there was widespread unauthorized use of water from surface systems, which were not reported in village records. They were of the opinion that the increase in ground water for irrigation (33 per cent) was higher than the increase in surface water (15 per cent) for irrigation.

Kubo (2005), studying cropping pattern changes in Andhra Pradesh during 1990s noted that production of millets was severely affected. In highly irrigated areas, Kubo saw crop substitution between groundnut and other oilseeds; chillies substituted millets in less irrigated region wherein tube well irrigation was increasingly taking place. Though oilseeds cultivation increased in lands released from millets cultivation, the profitability of oilseeds deteriorated due to liberalization. Areas in which millet cultivation was substituted, many lands were left fallow because of water scarcity. This caused seasonal migration of farmers and also affected the health and education of their children.

Randhir and Krishnamoorthy (1990) in their study on inter-farm variations in productivity found that well water supplemented lands yielded more production compared to lands, which were solely dependent on tanks for irrigation in Chengalpattu district in Tamil Nadu.
Rajesh (2000) used Technology Adoption Index (TAI) in agriculture as the summary measure of technology adoption for each crop. Its value would vary across the farmers in proportion to the deviation of actual practice from recommended practice. The study was done with reference to dry farm technologies in the cultivation of bajra, sorghum and cotton in Aruppukkottai and Kovilpatti blocks in Tamil Nadu. He found wide variations between TAI recommended and actual practice. He noted that higher technology adoption helped to achieve higher productivity and provided more stability in yield; non-awareness and doubts on the benefits of new technology, faith in traditional farming, inadequate finance and costly inputs were constraints for technology adoption.

Balasubramaniyan et al., (2002), in their case study of a village in Tamil Nadu, noted that large farmers used modern technologies to replace labour while marginal and small farmers relied more on labour for their activities. They also found that cropping intensity and the percentage of area under buyback arrangement were higher among marginal and small farmers.

In their study on dry land cultivation in Madurai district of Tamil Nadu, Fatrimson and Rao (2002) argued that over exploitation of ground water and heavy subsidies to electricity for irrigation by GR package caused 25 of the 198 open wells to go dry between 1990 and 2002. They found that the scarcity of water forced many farmers to change from paddy cultivation to less irrigation-intensive perennial crops like mango and coconut; the farmers whose wells went dry shifted to rain-fed crops even though they had high incidence of crop failure. Along this trend, the failure of rainfall over a few years affected the level of employment resulting in increasing migration to urban areas.

Binswanger and Khandker (1993) noted that the agricultural output was determined by the interactive process of farmers, government and
intermediaries. The rural banks played an important role in determining investment, input and output decisions; they also started branches in areas where the agro-climatic potential was high. In such areas, government investment on infrastructural development also took place.

Tara Nair (2000) found the twin sectors of formal (Commercial Banks, Regional Rural Banks and Cooperatives) and informal sectors (traders, merchants, moneylenders) operating in the rural financial system in India. She was of the opinion that until 1960s cooperatives were the only formal credit source for the people and in subsequent period the commercial banks started to extend their activities in rural areas after bank nationalization (1969 & 1980). Reserve Bank of India (RBI) regulations and IRDP guidelines further expanded the commercial bank activities in villages. Consequently, there was decline of non-institutional sources of credit since 1970. However, there had been a constant decline in the formal sector credit to rural areas during late 1980s and 1990s. Share of primary sector lending of total credit which rose in 1970s and 1980s decreased during 1990s. While 55 per cent of rural credit had come from commercial banks in 1994, priorities for agriculture diminished from 52 per cent in 1985 to just 11 per cent in 1994. She was of the opinion that reduction in rural credit flows during late-1980s and 1990s caused decline in private capital formation in the rural areas.

Desai and Namboodiri (1996) stated that, besides technological change expansion in institutional credit was instrumental in the agricultural growth since the beginning of GR. They found that the presence of rural financial institutions (RFIs) caused a decline in the interest rate with reference to credit extended by rural informal lenders. The emergence of RFIs made the private lenders entering the market to follow the RFIs. Recognizing the role of primary agricultural cooperatives (PACs), the authors found three problems in the
functioning of RFIs, namely, persistent loan delinquency, politico-bureaucratization and low resource efficiency.

Sahu et al., (2004) found that the lack of access to institutional credit by poor farmers made them depend on informal sources to meet their production costs. In Kalahandi district of Orissa, the strong linkage between credit and product sale made the farmers to sell their produce, especially paddy, at distress prices. Further, the role of traders in the transactions caused lower price for the produce paid to the farmers by the mill owners.

Ramakumar and Chavan (2007) found that the revival of credit flow to agriculture claimed by government sources was because of the definitional changes in the indirect finance by adding new forms of finance. With reference to the new format, in the existing forms of indirect financing, the credit limit was raised and new forms of commercial, export-oriented and capital-intensive agricultural credit were added. The authors noted that the credit flow revival to agriculture actually started in 1990s contrary to the claims of some government agencies that they started in 2000. The authors stated that the share in the agricultural credit of big cultivators owning lands of more than 5 acres had increased between mid-1990s and 2004-05.

Mohan (2006) found that even though overall flow of institutional credit to agriculture over the years increased, there were gaps in the system, such as inadequate credit supply to small and marginal farmers, paucity of medium and long-term lending and limited deposit mobilization. He suggested that the formation of farm expert team which would look into requirements of each agro zone and region-specific package that would include credit and technologies.
An editorial in the Economic and Political Weekly (EPW, 2004) stated that profit orientated institutional agencies had neglected agricultural credit in the post-reform period; the credit flow to agriculture had been poor and non-performing farm loans were lower than that of industrial sector. Moreover, there was a fall in the proportion of total bank credit earmarked for agriculture from near 18 per cent in the mid 1980s to 10 per cent in March 2003, despite the fact that interest paid by agriculture sector was higher than the others by weighted averages. But in recent years, commercial banks accord some priority to farm activities due to the regulations given by the government following the droughts. The professional reluctance of commercial banks to operate in rural areas since 1990 led to the closure of 840 rural bank branches in 1995. This along with the failure to strengthen cooperatives and (Regional Rural Banks) RRBs had led to a physical limitation to deliver rural credit.

Chavan (2007) analyzing the access to rural credit found that there was a sharp fall in the share of commercial bank credit to total credit of dalit households 1992 and 2002; the banks failed to reach the target of credit lending to weaker sections after 1991. The gap was filled by professional money lenders who emerged strongly in 1990s in fulfilling the credit needs of rural households especially the dalit households. This trend, according to the author was a mark departure from the trend that evolved since early 1990s when India adopted the policy of social and development banking.

Patil (2005) stated that the state cooperative agricultural and rural development banks initially helped the farmers to repay their debt to moneylenders by providing long term loans and the RRBs also also focused on weaker sections such as, marginal and small farmers, artisans, agricultural labourers and small entrepreneurs. The cooperative credit system providing agricultural inputs and institutional credit created an indispensable financial structure in the rural areas. Though the failure of cooperatives was pointed out,
many committees stated that the cooperatives were the only alternatives in Indian villages. On the functioning of the rural banks, the author noted that they were primarily concentrating on deposit mobilization and their credit delivery ratio declined from 60 per cent in 1991 to 39 per cent in 2001. Though the production oriented development system and GR required increased demand for credit, the government had not taken sufficient steps to revitalize cooperatives and other rural credit institutions.

EPW Research Foundation (2008) stated that the decline in agricultural credit extended by scheduled commercial banks between 1991 and 2001 especially to small and marginal farmers led to an increasing role of moneylenders in agriculture. The violation of priority sector lending by banks was mainly because of unhealthy socio-political environment causing indiscipline in repayment of loans.

Mahajan (2005) while admitting the contribution of micro-finance towards poverty alleviation stressed the need for a comprehensive livelihood finance to promote sustainable livelihoods of the poor. He stated that such finance would be of large amounts for longer periods rather than small amounts for short periods.

Byres (2002), in the context of technological changes in agriculture, stated that there was an increasing need for a flexible labour input in agriculture. He was of the opinion that the required shift to wage labour was not yet fully worked out and was in its relatively early states.

Sidhu and Singh (2004) observed that in the late-90s in Punjab, the increased use of combine harvesters replaced human labour for harvesting and threshing considerably; human labour in paddy cultivation declined by 45.6 per cent, while the use of machinery increased during 1981 to 1999. The
technological development was the prime reasons for peak of labour demand in shorter intervals. The authors also found that the skewed pattern of labour demand in harvesting season and the increasing cost of living resulted in increased wage rates in 1980s and 1990s. The authors also noted that any crop diversification from paddy and wheat to oilseeds and pulses would not increased demand for labour, because such crops required less labour.

Narayanamoorthy and Deshpande (2003) held that demand for labour was persistently higher in the region with better irrigation facility and the wage differences would be less in highly irrigated regions. In rain-fed crop regions, the demand for labour was lesser and the farmers were unable to pay wages at minimum wages act level. In their view, the amount of gross cropped area per labour and irrigation facility was positively related to wage rate.

Chandrasekar and Ghosh (2006) found that the rate of increase in employment per unit increase of GDP in agriculture had fallen from 0.7 per cent (1987-88 and 1993-94) to 0.1 per cent in 1993-2000. The authors argued that increasing non-farm employment opportunities at rural areas were not sufficient to provide alternate employment. They held that besides these pull factors, there were many push factors responsible for the labour mobility towards non-farm sectors in rural areas. They cited that the labour saving cropping pattern involving flouriculture and horticulture reduced demand for labour. In the changing agricultural scenario, marginal and small farmers were made to search for jobs as landless labourers, at the same time, the medium and large farmers sustained agricultural activity by using capital intensive technologies, according to the authors.

Patnaik (2003) exploring the declining growth rate of employment in both urban and rural India in the 1990s found the magnitude of decline much sharper in rural India. The absolute level of growth rate of employment in India
at 0.58 per cent in the 1990s was far below the rate of growth of rural population and therefore, it could be inferred that the rural unemployment rate increased substantially.

According to Deshpande and Jha (2007), the farm crisis after liberalization process started in India, focused on only the problems of farmers and by-passed agricultural labourers. In their view, the declining proportion of workforce engaged in agriculture was lower than the decline in the share of agriculture to GDP. The consequent increased density of agricultural labourers along with marginalization of farms led to marginalization of the rural household economy; it made a large number of peasants resource poor.

According to Brajesh Jha (2007), socio economic conditions of agricultural labourers had complex linkage with the economic transformation and policies meant for their welfare. Economic reforms in 1990s affected the rural sector in an adverse manner and consequently agricultural labourers were also the victims. NSSO indicates that the number of employment days for both male and female in agricultural labour households declined during reform period (1990s). According to NSSO, the number of days of employment for men declined from 235 to 222 days between 1993-94 and 1999-2000; that for women also declined from 203 to 192 days during the same period. The 61st round of NSSO in the year 2004-05 stated that the number of working days improved between 1999-2000 and 2004-05. But this increasing rate was due to the increase in self-employment; the wage employment of agricultural households had shrunk. On the basis of the NSSO and wage statistics from labour bureau, Jha found that there was increase in real wages of agricultural labourers without increase in labour productivity. The increasing wage rate without commensurate improvements in labour productivity, according to Jha, could not be sustained in the long run. Larger development strategies rather than specific policies are needed for the development of agriculture labourers.
Balasubramaniyan et al., (2002) did household survey in Pudupatty village of Dindigul district. They also used participatory rural appraisal (PRA) and focus group discussions (FGDs). Marginal and small farmers were found to rely more on labour where as large farmers used modern technologies to replace labour. The study findings disproved the theoretical premise of ‘inverse relationship’ between family labour and farm size.

The authors used two indicators namely, Cultivated Land Utilisation Index (CLUI) and proportion of land under buyback arrangement with the markets in their study. With the help of these two, they found that cropping intensity and the percentage of area under buyback arrangement were higher among marginal and small farmers. Intensive cultivation and short linkages with the market were seen as the major reasons for marginal and small farmers using high levels of hired labour and material inputs.

This study found female labourers with more employment opportunities than men in horticultural and related activities. Horticultural activities gave higher amount of wages for skilled women who had training in agro-industries, Krishi-Vigyan Kendra (KVKs) and NGOs organized training programmes. Younger and older women did different types of activities and each operation required one type of women. Women also went to nearer villages to get jobs. There were piecemeal rate in some value addition jobs. Thus, in this village, gender division of labour in agriculture took place through stereotyping works.

Wage rate differed with skilled and unskilled women. But they got wages below the average wage rate of men. Female labourers were able to get help from farmers during times of need such as marriage, etc. The kinship network among landless dalit women helped them during semi-starvation time. But no such kinship network of employment was seen in non-dalits women landless workers. Farmers extended advance to both dalit and non-dalit
labourers to ensure their availability for work. Female labourers got 156 days of employment per year men got 154 days. Average wage rate for female was Rs.35 and for male was Rs.55. Puduppatti village workers need outside employment, because the village was not able to create sufficient employment to all.

The discussions above on review of literature relating to the specific areas of the agrarian economy brings to the fore the following aspects of Indian agriculture: GR the major change in Indian agriculture consisted of two phases, the first (mid 1960s to late 1970s) showed increased growth and the second (early 1980s to present day) exhibited near stagnant growth; there were also regional variations in the above mentioned pattern; during the period of 1983-95, the HYV technology which was confined to only certain regions permeated to all the regions of India and covered larger number of crops; the GR also hindered a spirit of entrepreneurship among progressive Indian farmers and led to larger utilization of groundwater besides multiple cropping in agriculture; however, the GR technology which contributed to increased productivity in 1980s turned different and forced farmers to apply more inputs to maintain same level of productivity in the later period; water management had emerged as a crucial determinant in sustaining the prospects of agriculture; there was widespread increase in the proportion of groundwater usage for irrigation especially in the State of Tamil Nadu; while marginal and small farmers relied more on labour, larger farmers gradually used modern technologies to replace labour; in the rural financial system, the formal sector credit extension increased substantially after 1970; despite limitations, the cooperative credit institutions are crucial for agricultural development; in recent years, there has been decline in agricultural credit by commercial banks; a comprehensive livelihood finance of larger amounts for longer periods considered essential for long-run growth of the agrarian economy; technological changes involving mechanization had reduced the demand for agricultural labour; thus, the rate of
increase in employment per unit increase in GDP in agriculture has declined since 1987; NSSO data revealed increase in real wages of agricultural labourers without increase in labour productivity; overall, since 1990, there has been a decline in the importance extended to agriculture.

2.2 Village Surveys

There is a long tradition of village studies relating to Tamil Nadu. During the second decade of the 20th century, post graduate students of Economics in the University of Madras, under the guidance of Professor Slater, then head of the department of Economics in the university, surveyed among them 12 villages in the Madras Presidency of which 5 are located in present day Tamil Nadu. The ‘Slater’ villages of Tamil Nadu have since been resurveyed in the 1930s, in the late 1950s and in the 1980s. Some of the surveys of ‘Slater’ villages carried out in the 1980s are briefly reviewed below.

The village of Iruvelpattu in present day Viluppuram district was first studied in 1919, and then in the 1930s. It was resurveyed by Guhan and Mencher (1982) in 1981-82 to understand the changes taking place in the village over a period of time. The major findings of their study are given blow:

The caste system, which was intensive in 1919, still persisted in the village in the form of economic inequality, social discrimination and physical segregation, the village was still divided into two parts. The SCs resided in one part and the caste Hindus in the other. The domination of one big landlord, described in 1919 as a plutocrat, still continued in terms of controlling local level bureaucracy and village institutions. Land reforms failed to reduce the land controlled by the plutocrat. At the same time, he was not interested in implementing welfare programmes for SCs, such as providing drinking water facility, educational development, etc. Even though his activities created tension among different groups, his economic power ensured the plutocrat’s domination in Iruvelpattu. Not much had changed in this respect between 1919 and 1981.
Guhan and Menchar found the introduction of pump irrigation, which envisaged new technology in agriculture such as high yielding variety seeds and chemical inputs in the agriculture of this village. But, since the capital costs of these new technologies were relatively higher, only large landlords got benefit of these technologies; the production and productivity of small and petty farmers were not developed. The development of new technologies in this village had constraints based on institutions, structures and ecology.

The new technology created new employment opportunities by way of introducing sugarcane cultivation and more trade activities within the village. But, the domination of the plutocrat and limited spread of new technology affected real wages during the 1970s. Therefore, despite increase in the days of employment in agriculture, people received wages lower than the subsistence level.

Guhan and Menchar concluded that the low level of agricultural wages, the concentration of landownership pattern and nil improvement in the productivity of small and petty farmers, meant that more than half of the households in Iruvelpattu were in poor economic conditions.

Athreya (1984) undertook in 1983 a resurvey of Vadamalaipuram, a village located in old Ramanathapuram district in Tamil Nadu; it was one of the villages, surveyed by Gilbert Slater in 1919.

Athreya found that the introduction of modern technologies and chemical inputs were new to the village. He also noted that the match industry and spinning mill provided employment opportunities to the village. He found that the development of spinning mills in nearby Virudunagar and the match industry impacted significantly on the occupational pattern of the villagers. The share of manufacturing increased considerably between the pervious survey (1958) and the 1983 survey. This had its impact on the social pattern of the
village. For example, Thevars and Pallars, who depended on large land owners, Naidus for their livelihood in the past, moved to manufacturing sector for their employment and the Naidus provided educational in professional avenues for their children. Pallars, a group of SCs, came out of the village and their younger generation was not dependent on the higher castes for their livelihood. The manufacturing sector also increased female workforce participation in significant manner. The male workers were employed in relatively modern spinning mills whereas female workers were in technically backward match units. In general, increasing modernization had led to important socio-economic changes.

The rising employment in manufacturing units had led to labour shortage in agriculture. The village was relatively modern in the sense of infrastructural availability, even in 1916; the trend continued. The available infrastructural facilities promoted the development of the village, including female literacy.

The agrarian economy modernized a lot in the sense of cropping pattern and intensification of crops cultivated in this village, over the period. Cultivation of commercial crops increased. Even paddy and millets were also marketed relatively more than before. Though the yields increased, above the average level of state yields, increasing costs meant that the returns from the lands did not increase proportionately.

The employment days available for male labourers declined in agriculture along with marginal increase in real wages, between 1958 and 1983. This increase was mainly due to increasing wages in manufacturing sector. The average income of an agricultural labour family was well below the poverty line of the state and therefore, the labourers had to search for alternate employment for their livelihood.
The large landowners benefited more by modernization of agriculture whereas the small cultivators had to continue with less remunerative agriculture. The large landowners also increased their income by non-farm business such as hiring out tractors.

Diversification was taking place within the framework of already existing unequal distribution of lands and it increasingly helped the large landowners. The poor comprising of the large section of population were not able to improve their standard of living.

By resurveying Palakurichi in Nagapattinam taluk of old Thanjavur district, one of the Slater village initially surveyed by scholars of the University of Madras in 1919, Guhan (1983) found that population growth of the village was similar to the trend in the taluk and district. He further found significant changes in among the agricultural workforce over 50 years of the village. The technologies introduced in 1960s made a second crop possible. But irrigation was a constraint. Guhan suggested improving delta irrigation system to utilize modern technology fully. Since the village was located in tail-end of the delta area, the farmers were severely affected by the scarcity of water supply from Kavery river.

The introduction of machines for farm operations, such as tractors replaced draught animals and also enhanced the surplus appropriation by large farmers by the way of tractor hire charges. The poor farmers who used draught animals were forced to search for alternate source of their income.

The increase in supply of labour executed a downward pressure on wages; however, strong labour union agitations ensured wage increase for labourers and crude landlord suppression came to an end. Increasing
infrastructural facilities and modern communication increased the liveliness of the village economy.

Even though caste consciousness was strong in the area, labour unionization eroded that among the poor. The village of Palakurichi thus, experienced changes in technology, government and also in social and political aspects.

A resurvey of Aurepalle and Dokur Villages in Mahbubnagar district in Andhra Pradesh by Deb et al., (2002) showed the diversification in sources of income between 1975 and 2001 done by Deb et al., (2002).

The real income derived from agriculture had decreased over the period mainly due to the declining agricultural output prices and coarse cereals in particular. The authors, therefore, found growing dependence on migration and non-agriculture in both the villages. Since migration also required some investments, such as transportation costs and socio-economic effects, youngsters were majority in numbers among the migrants. Migrants belonged mostly to landless households and small and medium farmer families. Authors also found increase in real income among the migrant households.

Naidu (1997) conducted socio-economic surveys and resurveys in 1985-86 and 1993-94 at two neighbouring villages, Enadimelpakam and Verkadu in Changalpattu district of Tamil Nadu. According to the report, Enadimelpakkam was an agriculturally modernized village, whereas Verkadu was an agriculturally traditional village controlled by few upper caste households in 1980s. But, by the early 1990s, there was a significant decline in land concentration in Verkadu due to land purchases by non-residents of that village.
The application of modern inputs in agriculture started in early 1970s in Enadimelpakkam; but such types of inputs were introduced in Verkadu only during 1980s. The diversification of employment started in 1970s at Verkadu, but in Enadimelpakkam, it started during 1990s. It was due to the location of Verkadu nearer to the town, than Enadimelpakkam. Therefore, there was greater non-farm employment opportunity for workers in Verkadu than those of Enadimelpakkam. The farmers in Verkadu village got higher income and experienced lower cost of cultivation than Enadimelpakkam. On the contrary, larger proportion of households in Verkadu which depended mainly on non-agricultural occupations for their incomes experienced greater absolute poverty than Enadimelpakkam. Finally, the survey showed that the impact of modernization and green revolution technologies to agriculture was against agricultural labourers in these two villages, as the non-farm employment opportunities were limited. Moreover, the wages of immigrant labourers also declined as a consequence of the application of modern inputs. Land reforms act did not play any significant role in these villages.

In his resurvey of the agrarian economy of Alapakkam village in Arakkonam taluk of Vellore district, Sivasubramaniyan (2002) studied the social changes of caste, class and also the landholding pattern in the village between 1991 and 2000. The author found that the village witnessed crucial changes in both agricultural and non-agricultural sectors. He noted that the literacy rate consistently improved after 1991, while the population growth rate declined during the same period.

A major section of agricultural labour belonged to SC and as much as 90 per cent of labour force was engaged in agriculture. Transformation in landholding pattern had occurred; Brahmins and Mudaliyars sold lands to Reddys and Pillais. The author also noted that while a few dalits had acquired lands, majority of them still remained landless.
Though the number of wells used for irrigation increased between 1983 and 1999, the quantity of water for irrigation from the wells was not sufficient. The water supply from the five tanks in the village also declined. The water scarcity caused decline in cropping intensity over the years.

In the cropping pattern, Sivasubramanian found changes in the Alapakkam village; there was a change from cereals other than paddy to sugarcane and oilseeds. This change along with the PDS affected the food habits of the people. They gradually decreased the consumption of coarse cereals and switched over to fine variety cereals like paddy. Though a large size of the labour force was engaged in agriculture, diversification to other jobs during change of seasons had also increased. The nearby industrial areas provided employment opportunities during their seasonal employment requirements.

The author noted increasing numbers of livestock population over the period, but observed that animals used for ploughing had declined due to mechanization.

In the decision making process in the village, people belonging to Reddy and Pillai castes dominated; though SCs gradually occupied third position in landholding, they had less role in the village community decision making process.

In his conclusion, Sivasubramanian said that despite considerable changes in agriculture, caste composition, landownership etc, the down-trodden people were yet to get empowerment in Alapakkam village.

In their elaborate study on the nature of income dynamics in Tamil Nadu for the period 1971 to 2003, Kajisa and Palanichamy (2006) used the data on
cost of cultivation of principal crops and NSSO data. For their study, they selected villages belonging to six classified agroclimatic zones in Tamil Nadu. Initially, 40 villages were selected and from 1981 onwards 20 more villages were also selected and the same households were considered for survey over the period of study.

They found that until 1990, the income growth depended on GR and its related farm opportunities; after 1990s, this trend changed such that income growth was determined by the non-farm sector employment.

The authors observed that GR technologies enhanced human development in the 1970s, but contributed insignificantly after 1980s. Therefore, the authors held that human capital development revived because of farmers' access to non-farm job opportunities in the recent years.

The increasing non-farm sector adversely affected water available for irrigation in 1990s; the authors felt that it was also a reason for irrigation problem in the area.

The authors viewed that poverty alleviation programmes were to be implemented effectively in order to reduce the inequality in human capital development in favour of the rich; this was to be done through access to higher education.

In Gokilapuram village, which was located in Theni district of Tamil Nadu, Ramachandran et al., (2002) conducted number of surveys between 1977 and 1999. Compared to 1970s, according to the authors, the cropping patterns were changed in the village. Punjai lands were kept fallow and that lands were sold for house construction and other non-agricultural purposes.
They also found that the nature of crops cultivated under groundwater irrigated lands, such as coconut, banana and graphs, attracted large male labourers rather female. Hence, the number of agricultural employment days for male was increased, on the other hand, female agricultural employment days were declined over the period. Therefore, the share of agricultural work to total female working days which was 65 per cent in 1970s declined to 38 per cent in 1999.

The authors also found that the real-wage rate was increased between 1970s and 1999, hence, the head-count ratio of income poverty among the landless labour households had declined between these periods.

Neelakantan (2003), in his study on the changes in Chettipalayam village near Karur in Tamil Nadu, analysed the dynamism of the village after independence.

The author found the following changes in Chettipalayam between 1960s and 2003;

- Cropping pattern and agrarian relations changed significantly
- Cash crop sugarcane and HYVs replaced dry land crops;
- Cash and contract labour became a common feature;
- Supervisory land lords sold their lands to owner-cultivators;
- Agriculture faced scarcity of labour due to labour migration to the nearby textile town, Karur;
- The increasing uncertainty in agriculture made young men and women to look out for employment elsewhere;
- There was increase in the number of tube wells;
- Farmers sold water for an attractive price to dyeing industries during periods of water scarcity;
Rapid expansion in sand mining caused decline in water table;

The issue of water turned to a struggle for water for drinking, irrigation and industrial needs;

The water problem was further aggravated by another struggle to protect the water sources from the pollution caused by discharge of industrial effluents into the channels.

Neelakantan concluded that the future of Chettipalayam was not clear.

"The village surveys show that unit costs have been increasing over time in agriculture. There has also been a tendency toward mechanization, including investment in irrigation pumps and borewells and tubewells. The increase in costs of production and usage of modern techniques require more financial support; on the contrary, the role of formal sector in rural credit has declined in this period. The relative decline of institutional credit to agriculture has therefore hurt agriculture. The decline in number of days of employment has been noted in most of the village studies. This has obvious negative implications for rural labour households, and our findings are also consistent with these findings.

The above mentioned village resurveys found the changes were not uniform over the period. Though there were some increases in the non-farm employment opportunities here and there, in general, there was no overall increase in employment opportunities. The studies further found that there was high inequality persisting in the villages. Though caste oppression has come down in different parts of the State, it does not mean that it has been completely eliminated. In some of the villages studies, the landlords are still
dominating in many ways; the crop diversification is more meaningful to those large farmers”.

As already mentioned, the present study is also a resurvey of two villages in central Tamil Nadu. The earlier study was conducted curing 1979 and the results were published in a book (Athreya et al., 1990). It is necessary to summarize the earlier study.

2.3 Barriers Broken

Venkatesh B Athreya, Goran Djurfeldt and Staffan Lindberg (1990) endeavor to analyse the process of agrarian change by focusing on the wide spectrum of agrarian relations. Athreya, et al., look at the problem of relations of production and agrarian change from two key angles; firstly, the forces of production which were important in determining production relations; secondly, the role of state intervention in conserving and transforming relations.

Based on the above backdrop, the major objectives of the work were

- Comparing different agrarian ecotypes, such as, tank, canal, well irrigation and dry farming;
- Studying the range of relations of production; and
- The pattern and tempo of agrarian change and its impact on relations of production

The authors selected study areas with diversified cropping pattern, considerable middle peasantry engaged in commodity production and advanced capitalist development in some aspect. They selected two Panchayat Unions in Tiruchirappalli district, namely Manapparai and Kulithalai, belonging to ‘wet’
and ‘dry’ ecotypes respectively. The wet ecotype had river Kavery as major source of irrigation and landlord domination in the agricultural land ownership pattern. In the dry ecotype, agriculture was rainfed in nature, even though tanks provided some irrigation; middle peasants dominated in agricultural operations in this ecotype. They further selected three villages from wet ecotype namely, Rajendiram, Poyyamani and Nangavaram and three villages from dry ecotype, namely K Periyapatti, Kalladai and Naganur for further village level analysis.

Major findings of the study are as follows:

The landlords in the wet villages did not till the land and were merely collecting rents from their property of lands; this practice was partially altered by land reforms. Bharamanical hierarchy characterized the wet ecotype. Udaiyars, Naikars and Vellalars belong to the present castes, dominated in dry ecotype. Even though the SCs were numerically significant in the wet villages, they were as the bottom of the social hierarchy.

The study focused on the contrast between two eco types, namely, intensive canal-irrigated wet lands or the ‘wet’ ecotype and extensively rainfed dry lands, called the ‘dry’ ecotype. The area in the dry belt had hot and semi-arid climate with 800-900 mm of rain per annum. The wet lands in the study area belonged to the head reaches under the Kaveri river delta. Farmers enjoyed annually eight to ten months of water from the river. The region was using river water intensively compared to any other in the state.

Tanks, a main source of irrigation in dry areas, were shrinking due to lack of proper maintenance. Well irrigation had become the main source of irrigation in the dry villages. Out of 46 per cent of cultivated area that was irrigated, 81 per cent were well-fed; of the remaining 19 per cent, 73 per cent
were supplemented with well. There was extensive usage of groundwater in Manaparai Panchayat union which was twice the recharge rate. The authors predicted that, though there was no complaint of water scarcity by the farmers, the problem was likely to aggravate in the future.

Though the entire wet area belt of the study area belonged to the head-reaches of Kavery, the tail-end lands within the region remain fallow after the two paddy crops. In the remaining lands gingelly and blackgram were cultivated during summer.

Scope for motorized irrigation added some intensity to even the dry area, where paddy had become more important followed by cotton and groundnut. Including partial fallows, three-fourths of the potential land resources were not utilized in dry areas.

Paddy occupied 60 per cent of the gross cultivated area in the wet region. The HYVs required less water and needed short duration; that trait attracted mostly tail-enders and gave way for sesame or blackgram after two crops of paddy in the tail-end areas. While half of the paddy cultivated lands was under locally improved varieties (LIV), the remaining area was covered by HYVs in wet region. In the dry belt, farmers were slow to adapt to the HYVs due to less optimal drainage and soil nature.

Banana had been an important crop in Kulithalai area for a very long time due to sufficient access to water. It covered 20 per cent of gross cultivated area in wet ecotype. It required sufficient access to water and proper attention. Like banana, sugarcane covered eight per cent of cropped area in the wet ecotype. Cane and banana jointly covered 55 per cent of land resources in wet
area. Sugarcane was supplied to local sugar factory in Pettavaithalai. Along with these crops, gingelly was also cultivated after second crop of HYV paddy. It was noted that the longer duration needed by the LIVs prevented the farmers to go in for gingelly cultivation. Coconut orchards were found to be maintained by absentee landlords.

In the dry villages, the HYVs of paddy were increasingly replacing LIVs. Short duration crops were found more preferable in dry areas. The number of crops was limited in dry area, unlike wet area. Sorghum, millets, ragi, tenai, varagu and samai, the water resistant crops by nature, were the common crops in dry area. Though paddy was the most preferred crop, its cultivation depended on the required availability of water, which was in scarcity in the dry areas.

The importance of livestock was due to two factors, traction power for agriculture and green manure for maintaining micro nutrients and to retain moisture. Milk sales were seen mainly among wealthy families for the urban market in wet villages. Main function of cattle was ploughing the lands. Animal husbandry had always been a traditional source of income in dry villages. Crop by-products such as, paddy hay were main fodder in both the areas. HYVs gave 40 per cent less fodder than the LIV and the situation threatened the future fodder supply, according to the study.

At the time of interview, pre-industrial technology was still in practice. Kavalai, traditional instrument to lift water from well, and iron and wooden ploughs were used for cultivation. In this aspect also there was internal division of labour. Chakkiliars, a scheduled caste, did the leather work for kavalai irrigation. The carpenter and blacksmith made and repaired the plough and other implements. The remuneration for those jobs, traditionally in kind, was being gradually monetized. Cash payment was more widespread in the wet
ecotype. Mechanization of well irrigation was introduced and encouraged by the State through provision of subsidized electricity. These mechanized pumpsets accounted for more than half of the well irrigated areas.

The land ownership structure was entirely different in the two eco-types. Skewed distribution and high landlessness were found in wet areas and less inequality was seen in dry areas. Brahmin and other upper caste landlords were dominant in the wet ecotypes in 1979-80.

Along with the skewed distribution in landownership in wet area, tenancy was frequent and some amount of reforms had taken place. Over the years, the registered tenancy in the wet areas had gone up. Though 90 per cent of the agrarian population belonged to category of landless or marginal land owners in wet villages, they had control over only 25 per cent of land area. The large land owners many of them Brahmin landlords, who contributed to less than 1 per cent of households controlled 45 per cent of the area.

In dry area, land distribution was less unequal; compared to wet area, the large landowners (owning more than 25 acres each) controlled only 16 per cent of owned area. About 76 per cent of area belonged to the middle- sized farmers (2.5 – 25 acres).

The land reforms and green revolution over the years had notable impact on the land relations in the study area. Roughly half of operated areas were cultivated by tenants. Mirasidars who owned lands depended more on their subordinates for cultivation, normally the Kavalkaran. To some extent, the land reforms increased the registered lease lands in the area; around 46 per cent of leased- in area were under registered leaseholds. Mobilization of the tenants by the Left parties and broad political support for tenants were the main reasons for this. The types of rents were varam wherein the inputs and outputs were
shared by the cultivator and land owner and *kuthagai* in which the cultivator gave fixed amount of kind or cash to the owner of the land. *Kuthagai* with cash payment was more prevalent than kind in wet areas. By 1979-80, some of the most exploitative forms of tenancy had disappeared, but rents remained high.

In the dry areas, most of the lands were cultivated by the owner, tenancy was rare and land mortgaging was infrequent. There was ‘peasantization’ instead of ‘proletarianization’ in the areas, where many of the landless became small land owners. Non-agrarian sources and migration were the main sources of saving income to buy dry lands.

In gross mobility, there was more mobility in dry areas than wet area. Landless households in wet area were immobile. In the dry area, on the contrary, 70 per cent of landless households had moved upward over the period. Small land holders were the least mobile group in dry area. In both the areas, above a certain point, mobility was found to move downwards.

In the wet villages, 25 per cent of heirs had left the village in the last generation. The related figure for the dry area was 30 per cent. Comparing the level of mobility among the different groups, it was higher in tenants than the land owner category.

Permanent farm servants (locally called as *pannaiyval*), though only a small section among wage-labour force, occupied an important position in the past. They substituted for family labour, especially in wet areas and with reference to medium and large farmers. They were totally bound to their employers and were not allowed to seek employment in other farms. These panniylas ‘enjoyed’ fringe benefits from their landowner during festival times and at the time of marriage of their children. There were other types of permanent labourers, such as *nirpaichi* (who handled irrigation) and...
**kavalkaran** (watchmen, supervisors and rent collectors). The last two mentioned categories reflected the traditional *jati* system.

In the dry areas, authors found similar type of bondedness. They found that children were also bonded to farmers due to the loan taken by their parents.

Wage labourers were common in both regions. Intensified crop pattern by irrigation and cash crops led to the practice of hiring labour through a collective contract system (*kothu*). This system was also prevalent in some parts of dry areas. This system of ‘gang labour’ made it more difficult for old persons and women with young children to find employment. They were able to get employment in this system only during peak season.

The difference in the importance of these labourers in the two areas also depended on the nature of agriculture and the land relations. The nature of farm economy in wet area necessitated even smallest farmers to increasingly rely on hired labour. In the wet area, because of heavy concentration of landholdings, family labour participation, among the farmers was very limited compared to the dry area. Thus, according to Athreya et al., the difference between two ecotypes in reliance on hired labour was a result of difference in land relations.

Specialized labourers for certain activities supplementing agriculture and otherwise, such as carpenters, cobblers, washermen, barbers and potters existed in these regions. This specialized labour system was well organized within the caste system, for example the cobblers came exclusively from *Chakkilian* caste; carpenters from *Asari* caste. They were paid by farmers on annual basis.

Poor peasants and landless wage labourers belonged to the exploited section of society. Poor peasants owned some piece of land but their main
source of income was wage labour. The wage labourers did not own any lands. Poor peasants, because of owning some land, had the scope to hold buffer stocks. The landless labourers could not hold any buffer stock as they did not have lands. Athreya et al., found that the levels of income for agricultural labourers and poor peasants were low. The income of others was often above the official poverty line. The labour population, because of their poverty, was forced to spend most of their income on foodgrains and had little left to spend on other food items such as milk and vegetables, and for other expenditure.

The existence of large amount of hired labourers in both the ecotypes was emphasized by the authors on the basis of economic and social factors rather than technology. The ready availability of agricultural labour and alternate employment opportunities for family labour were the main reasons for farm households diversifying into other avenues and at the same time maintaining their agricultural operations employing the available labour.

Athreya et al., collected information from banks, cooperatives and interviewed informants, moneylenders, grain merchants, rice-mill owners and fertilizer dealers. Even though some respondents were not ready to disclose true rate of interest due to fear of the powerful moneylenders, authors considered that the data to some extent was reliable, since it was collected from a wide discussions with different sections of villages.

Usurious capital was an important source for deriving surplus appropriation in land rent dominated areas. The exploitation of peasant labour would be high when the usurious capital and merchant capital functioning in combined manner. In such a system, the merchant- cum- moneylenders controlled the development prospects of subordinate agrarian economy by extorting entire surplus. This type of system, however, was not found in the study area in this form.
The proportion of indebtedness among the agrarian households in both areas was 80-90 per cent; mean debt in wet area was equal to the subsistence requirement for a full year and in dry area, it exceeded these requirements by about 50 per cent. The latter one, according to Athreya et.al., might be due to the increasing private investment in irrigation required in dry area. They also found a transformation in credit market (a reflection of transformation in relations of production), as 70 per cent of loan had been borrowed for investment purposes. However, the purpose among different classes differed in both the areas.

The poor peasants in both the areas were victims of usurious exploitation, since they borrowed money from moneylenders. Around 48 per cent of credit taken by poor peasants in wet area was for consumption. This showed that they had not attained high level of subsistence as the agricultural labourers. On the other hand, the poor peasants in dry area borrowed credit mainly for production purposes.

The institutional credit played a major role in the new agricultural investment, especially in dry area. Athreya et al., estimated that around 50 per cent of all credit in both ecotypes derived from cooperatives and nationalized banks. The low interest rate paid by a section of poor peasant class in both the areas revealed the increasing practice of institutional borrowing by these classes. This was, according to authors, mainly due to the effect of nationalization of banks, which started in the year 1969.

The repayment failure was common among poor and middle peasants due to crop failure, monsoon failure, difficulties in making profits with sinking water table, etc. Authors thus found that the institutional credit in the then prevailing circumstances, benefited upper classes to a great extent. The banks gave only less than 20 per cent of credit to poor and middle peasants; their
main customers were capitalist farmers. Therefore, the scope for usurious capital in the credit sector remained.

Overall, Athreya et al., identified dynamic changes in the agrarian economy making inroads into the system determined by social factors and thus, bringing widespread transformation in the rural economy of the region.