

4. Agriculture

Agriculture continues to be the main stay of the State economy in terms of livelihood support to over 60 per cent of the population. It contributed 13 per cent of State income in 2004-05. Besides providing employment opportunities to rural population, it supplies raw-materials to agro-based industries. Increased income is reflected in terms of potential, increased purchasing power of the farmers which in turn creates a market for industrial goods and services through operation of backward and forward linkages. There are constraints to increasing agricultural production through area expansion because the State has more or less reached a plateau in so far as cultivable land is concerned. Therefore, focus is on increasing yield rate and tackling the wasteland on watershed basis.

It is reassuring to mention that agricultural sector experienced a turn around in production during 2004-05 because of bountiful precipitation obtaining for the year. Thus, agricultural sector could recover particularly after a continuous decline due to failure of monsoon for three years in succession and resultant dip in production.

The agricultural growth strategy adopted by the State encompasses crop diversification and bringing additional area under green cover through comprehensive Waste Land Development. It gives emphasis to the efficient use of water, application of precision farming and adoption of new cost-effective technology. It also includes better market access to provide farmers better prices for their produce. This holistic approach also has its focus on the non-farm rural sector and rejuvenation of cooperative credit structure in order to finance farmers' credit needs. The challenge of creating avenues for off-farm employment so as to reduce the pressure on land is being met by appropriate interventions.

Land Use Pattern:

Land use pattern of the State has undergone rapid structural changes over the period. The net area sown which stood at 62.59 lakh ha. accounting for about 42.8 per cent of geographical area during Triennium Ending (T.E.) 1979-80, witnessed a decline to 42.78 per cent in TE 1999-2000 and further to 37.05 per cent in TE 2003-04. The decline in the net area sown was mainly attributed to increasing conversion of agricultural land into non-agricultural purposes including housing sites. The steep decline during TE 2003-04 was also attributed to the severe drought situation prevailing in the State due to failure of monsoon. The land put to non-agricultural uses rose to 15.70 per cent from 12.94 per cent. The forest area had increased from 15.58 per cent in TE 1979-80 to 16.45 per cent in TE 1999-00. It declined marginally to 16.37 per cent in TE 2003-04. The permanent pastures and other grazing lands had showed a decline from 1.27 per cent to 0.95 per cent and further to 0.90 per cent during the reference period. The current fallows had come down from 9.67 per cent to 7.76 per cent. However, it went up to 8.93 per cent during the respective Triennium ending periods. It is becoming evident that other fallow land is increasing steeply over the years. As a proportion to total geographical area it had risen from 3.5 per cent during TE 1979-80 to 8.75 per cent in TE 1990-2000 and further to 12.21 per cent during TE 2003-04. The trend in land use patterns is shown below:

Table - 1: Land Use Pattern

(Area in 000 Ha.)

Sl. No.	Classification	Average Area T.E.	%	Average Area T.E.	%	Average Area T.E.	%
		1979 - 80		1999-00		2003-04	
1	Forests	2025	15.58	2138	16.45	2129	16.37
2	Barren and Unculturable land	610	4.69	478	3.68	488	3.75
3	Land put to non-agricultural uses	1682	12.94	1966	15.13	2041	15.70
4	Culturable Waste	351	2.70	347	2.67	385	2.96
5	Permanent Pastures and other grazing lands	165	1.27	123	0.95	117	0.90
6	Land under miscellaneous tree crops and groves not included in the net area sown	195	1.50	238	1.83	277	2.13
7	Current fallows	1257	9.67	1008	7.76	1161	8.93
8	Other Fallow Lands	456	3.50	1137	8.75	1588	12.21
9	Net area sown	6259	48.15	5560	42.78	4817	37.05
10	Total geographical area	13001	100.00	12996	100.00	13003	100.00

Note: T.E. – Triennium ending.

Source: Season and Crop Reports of Various Years, Directorate of Economics and Statistics, Chennai-6.

The full import of the above observations is that rising population, consequent urbanisation, rural-to-urban induced migration, falling net areas sown, need for creation of substantial rural employment, indiscriminate housing activities, etc. are major areas of concern on farm front.

Distribution of Farmers by Size of Holdings:

Overall.

Size of land holdings often determines agricultural production and productivity. Further the land distribution is found to be skewed in Tamil Nadu. It is noted that average size of holding has been declining over the years. Average size of holding which was 1.25 hectare in 1976-77 declined to 0.91 hectare in 1995-96. As a result, marginal and small farmers have to subsist on low levels of income. According to the Agricultural Census, Marginal farmers accounted for 71.3 per cent and operated on holding of 25.9 per cent in 1985-86 and the corresponding figure was at 74.3 and 30.3 per cent in 1995-96. This showed an imbalance and asymmetry in the distribution of land holdings.

Table - 2: Agricultural Census

Category of operational holdings	1976-77		1985-86		1995-96*	
	No. (000)	Area (000 ha)	No. (000)	Area (000 ha)	No. (000)	Area (000 ha)
Marginal (Below 1.0 Ha.)	3951	1608 (0.41)	5498	2018 (0.37)	5951	2210 (0.37)
Small (1.0 to 2.0 Ha.)	1126	1586 (1.41)	1260	1772 (1.41)	1234	1721 (1.40)
Semi-medium (2.0 to 4.0 Ha.)	683	1876 (2.75)	649	1778 (2.74)	601	1623 (2.70)
Medium (4.0 to 10.0 Ha)	305	1763 (5.77)	261	1510 (5.79)	200	1135 (5.68)
Large (10.0 Ha.& above)	46	796 (17.28)	39	720 (18.37)	26	614 (23.37)
Total	6112	7628 (1.25)	7707	7796 (1.01)	8013	7303 (0.91)

*Latest year for which data published.

Source: Directorate of Economics and Statistics, Chennai 6. Note: Figures in brackets indicate average size of holding.

As borne out by the table, the number of marginal farmers had been on the increase. It shows that the process of marginalisation of farmers and casualisation of labour is on because of structural transformation taking place in the State agriculture.

Operational Holdings By Social Group:

An analysis of operational holding by different social groups shows that average size holdings by SCs are very much lower when compared to other social groups. While average size of holdings of other social groups was 0.95 hectare, it was 0.58 hectare for SC households. It is interesting to note that average size of holdings by STs are relatively higher at 1.24 hectare better than all other social groups, primarily boosted by better landholdings of Tribals in Kanniyakumari district and Gudalur Taluk in Nilgiris district. Among various category of holdings, it ranged from 0.34 ha. is marginal holdings to 15.84 ha. for large holdings in respect of SCs, 0.47 ha., to 14.62 ha. for STs and 0.37 ha. to 23.57 ha. for other social groups.

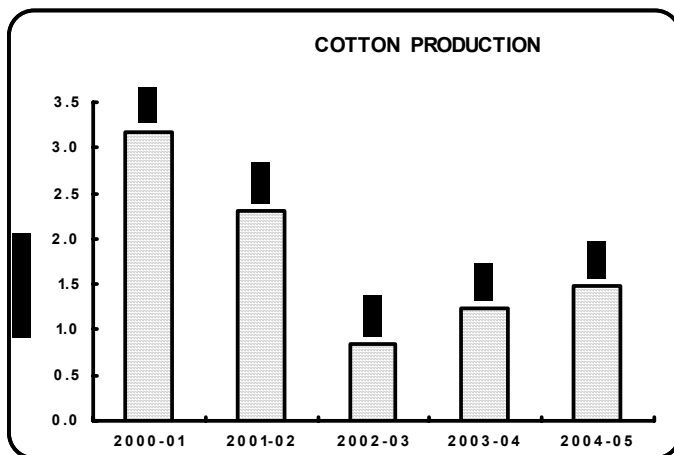
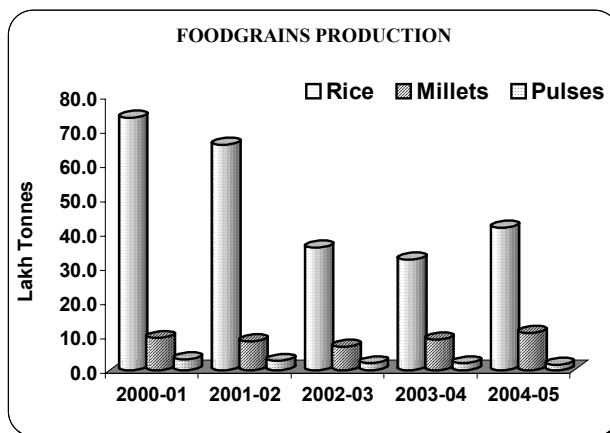
Table-3: Average Size Holdings By Social Groups and Categories

Sl. No.	Category	SC	ST	Other Social Groups
1.	Marginal (Below 1.0 ha.)	0.34	0.47	0.37
2.	Small (1.0 - 2.0 ha.)	1.37	1.40	1.40
3.	Semi-Medium 2.0 - 4.0 ha.)	2.63	2.70	2.70
4.	Medium (4.0 - 10.0 ha.)	5.47	5.51	5.69
5.	Large (10.0 and above ha.)	15.84	14.62	23.57
	All Sizes	0.58	1.24	0.95

Source: Department of Economics and Statistics, Chennai -6.

Area, Production and Yield:

The principal food and non-food crops such as paddy, millets, pulses and oilseeds, cotton and sugarcane are being cultivated in the State. The total cropped area and gross production of principal crops depend on the quantum and spread of precipitation during north east-monsoon and south-west monsoon periods. Paddy, a staple food crop, is grown extensively in the rice bowl districts viz., Thanjavur, Thiruvarur and Nagapattinam. Agriculture which



suffered extensively during 2001-02, 2002-03 and 2003-04 due to severe drought, experienced an appreciable revival fortunes during 2004-05. There was improvement in the area, production and productivity of various crops.

Table - 4 : Area, Production and Yield Rate of Principal Crops

Crops	Area (Lakh ha.)			Production (Lakh tonnes)			Yield Rate (Kgs. / ha.)		
	2002-03	2003-04	2004-05 (FFE)	2002-03	2003-04	2004-05 (FFE)	2002-03	2003-04	2004-05 (FFE)
Paddy	15.17	13.97	19.09	35.77	32.23	53.02	2359	2308	2777
Millets	7.12	9.03	9.70	6.83	8.88	11.35	958	983	1170
Pulses	5.63	5.37	5.76	2.00	2.01	2.29	356	375	397
Food grains	27.92	28.37	34.55	44.60	43.12	66.66	1598	1520	1929
Oilseeds*	5.92	6.95	8.22	7.60	9.64	13.20	1284	1387	1606
Cotton@	0.76	0.98	1.43	0.84	1.23	2.18	188	213	259
Sugarcane\$	2.61	1.92	2.32	24.17	17.66	23.40	9244	9192	10086

- - includes groundnut, gingelly, castor and sunflower @ - in lakh bales of 170 kgs. of lint each;
- \$ - in terms of gur.FFE -Final Forecast Estimate of Analysis Tamil Nadu -Quarter ending 31.03.05 and 30.6.05.

Source:1. Directorate of Economics and Statistics, Chennai-6.

A final Forecast Estimate figure shows that area under paddy increased to 19.09 lakh ha. during 2004-05 compared to 13.97 lakh ha. in the preceding year. Area under millets and pulses also registered increases. Total area under food grains rose to 34.55 lakh ha. against 28.37 lakh ha. during 2003-04. Appreciable increase in area is also noticed in respect of oilseeds and cotton during 2004-05. In respect of cotton, increases in the area could be partly attributed to extension efforts backed with supply of quality inputs. Farmers were motivated to go in for short duration varieties which is remunerative alternative crop for rice fallow pulses. To encourage cotton growers in Tamil Nadu, Contract Farming is popularized with the buy back arrangements. Under Contract Farming, the farmer is provided support in diverse areas such as marketing, input, credit, insurance coverage etc. This strategy has been introduced by private farms such as M/s. APPACHI cotton company of Pollachi and Super Spinning Mills Ltd. Coimbatore which arrange inputs distribution, insurance and crop loan including buy back arrangement. A tripartite contract farming model for enhancing cotton production has also been developed by the department of Agriculture with linkages to related agencies covering villages on a cluster basis.

Total food grains production during 2004-05 was expected to be of the order of 66.66 lakh tonnes compared to 43.12 lakh tonnes and 44.60 lakh tonnes during the preceding years. Total paddy production rose to 53.02 lakh tonnes during 2004-05, up from 32.23 lakh tonnes in 2003-04 and 35.77 lakh tonnes in 2002-03. About three-fourth of the total foodgrains production was contributed by paddy. Oilseed production was estimated at 13.20 lakh tonnes, improving from 9.64 lakh tonnes in 2003-04. Similarly, sugarcane production was estimated to increase to 23.40 lakh tonnes against 17.66 lakh tonnes in the preceding year.

Improvement in the productivity of crops played major role in enhancing the production during the year. Yield rate of paddy rose from 2308 kg. / ha. in 2003-04 to 2777 kg. / ha. in 2004-05. In respect of millets per hectare yield rose from 983 to 1170 kgs. and for pulses the increase was from 375 to 397 kgs.

Crop Diversification:

Given the constraint in terms of availability of irrigation for crops, traditional hydrophilic crops (like paddy, banana, sugarcane) are increasingly subject to moisture stress.

Hence, a crop diversification strategy that aims at a shift to crops requiring lesser moisture is increasingly becoming imperative and is engaging the attention of the policy makers. Crop diversification by a critically re-designed alternative cropping pattern based on agro climatic zone may be demonstrated in the farmer's holdings to effectively utilise the natural resources. This could stabilise production and productivity in the State. It focused on switching from low value to high value crops; water loving crop to water saving crop; single crop to multiple/ mixed crop; crop alone to crop with crop-livestock - fish apiculture and agriculture production to production with processing and value addition. This would bring high value and labour intensive crops and it could provide adequate income and employment opportunities to farming community in the State. Thus, there arose a need for raising *"more crops per drop"* with focus on drought resistant and less water consuming crops.

Factors such as declining supply of cultivable land, growing population, rising urbanisation, changing tastes and life styles have necessitated crop diversification. Monoculture leads to impoverishment of soil and low productivity. The State has been taking rapid strides in this direction. The implementation of Waste Land Programme has accorded thrust to horticultural crops in the project area. Farmers have switched over to alternative crops which have assured markets and consume less water. Cultivation of less water-intensive crops like sweet sorghum, sugar beat and jetropha have the potential to intensify the crop diversification process and drive agricultural growth.

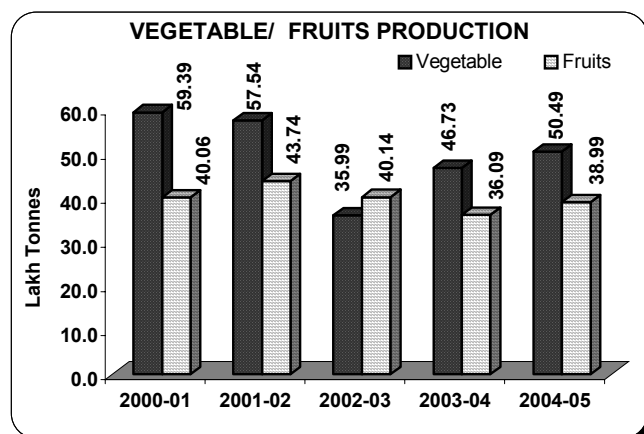
Jetropa:

In the context of steep increase in the prices of imported oil, attention is being focused on the feasibility of bio-fuel to meet the energy requirements of the economy. Cultivation of Jetropha is being encouraged substantially both by the State Government and the Centre.

Jatropha cultivation is to be taken on one lakh acres under contract farming. The plants has the potential of providing employment to farmers and processors besides contributing to greening. It would contribute to the growth of rural industries for production of crude oil and refined oil. The cost of cultivation would be Rs.10760 under dry land condition and Rs.19560 under irrigated conditions. Economics of this crop are very encouraging. It is a diesel substitute. Lack of subsidy schemes and the need for higher investment are impeding the cultivation of Jetropha in the State. It is further reported that non-availability of quality seed material is also an inhibiting factor.

Horticulture:

Demand for the horticultural crops such as fruits and vegetables is income-elastic. The consumption pattern over a period of time tilted towards horticulture products with steady increase in the per capita income. In the wake of growing population and swelling urbanisation a favourable shift in consumption in favour of horticultural crops need more coverage of area. These value addition crops provide raw-materials to agro-based industries besides providing employment opportunities to rural masses. The crop diversification technique has been advocated to boost production and productivity of horticultural crops. The horticulture crops contain remarkable potential for export earnings



in the State. The share of the State is 5.7 per cent in terms of area under horticultural crops and 7.7 per cent in terms of production at the national level.

India's share in world production of coconut is the number one, vegetables second, natural rubber fourth, coffee sixth, fruits tenth and tea 29th. The horticultural sector consists of a wide range of crops such as fruits, vegetables, spices, plantation crops, floriculture, medicine and aromatic plants, cashew etc. Mango, banana, citrus, apple, guava, papaya and grapes share the bulk of fruit production. Horticulture is a potential source of diversification in agriculture.

The *shelf life* of food grains is over three years or even more against fruits whose self life ranges between one week and 3 months. In view of this, strategies involve a separate road map for value addition in fruits and vegetables, adequate infrastructure such as cold storage, refrigerated transportation, rapid transit, grading, processing, packaging and quality control.

The State has a vast potential for successful cultivation of crops like mango, banana, cashew, tapioca, medicinal plants and flowers which are being exploited intensively under the Horticulture Mission. The State has set up a Mission for Horticultural Development aiming to achieve 8 per cent annual growth during X Five Year Plan in this sector. This gives impetus to production, processing for value addition and marketing of horticultural crops such as vegetables, fruits, flowers and medicinal plants. Tamil Nadu is the first State in India to set up a separate Mission for the development of horticulture. It also aims to double the horticulture production by 2011-12 in the State.

Objectives of Horticulture Mission:

- Improving production through balanced nutrition management;
- Evolving suitable mechanism for regulating the production of quality planting materials and giving impetus to research;
- Creating adequate infrastructure for post harvest management, especially, preservation and marketing; and
- Encouraging active involvement of farmers Association in the adoption of modern technologies.

Beyond the Mission's thrust on the production of horticulture crops, it advocated crop development strategies such as adoption of IPM and INM techniques, training of farmers in latest technology, laying of demonstration plots, efficient irrigation management through installation of micro irrigation systems such as Drip Irrigation and Sprinkler Irrigation techniques.

The State signed a Memorandum of Understanding with the Agriculture and Processed Food Products Export Development Authority for setting up an Export Promotion Zone for cashew at Rs.10.36 crore. The zone will enhance export to Rs.100 crores in three years and provide employment to 20000 persons.

Despite the failure of the monsoon in the last three years, the area under horticulture increased from 7.77 lakh ha. in 2002-03 to 8.25 lakh ha. (15.1%) in 2003-04 and this area has been projected to 8.91 lakh ha. in 2004-05. The fruits, vegetables and plantation crops shared more than 75 percent of the area coverage under horticultural crops in 2002-03 and 80 per cent in 2003-04 and projected to 78 per cent in 2004-05.

The overall production of horticultural crops had improved from 91.70 lakh tonnes in 2002-03 to 99.46 lakh tonnes in 2003-04 the growth being 8.5 per cent. The projected production stood at 107.45 lakh tonnes during 2004-05 showing a better prospect. The production of fruits and vegetables alone accounted for about 83 per cent in total production in 2002-03 and 85 per cent in 2003-04. The productivity of horticultural crops had experienced a dip of 14.2 per cent in 2002-03. However, it had regained its level by 2.2 per cent in 2003-04. Tangible improvement is anticipated in 2004-05.

Medicinal Plants:

With the growing importance of ayurvedic and siddha medicines, the importance of raising medicinal plants is Central to the State's health policy. Area and production of medicinal plants which are confined to Western Ghat districts and also in the districts of Thoothukudi, Dharmapuri Thiruchirapalli, Pudukkottai, Perambalur, Karur and the Nilgiris remained static during 2004-05. While, the extent of area covered by medicinal plants was around 4000 ha. total production was estimated at about 8000 tonnes giving an yield per hectare of two tonnes. Area and production are almost in constant proportion.

The State implements State and Centrally-sponsored Schemes viz., Integrated Horticulture Development scheme (IHDS), Integrated Tribal Development Programme (ITDP), Western Ghats Development Programme (WGDP) and Hill Area Development Programme (HADP) during 2003-04 and also continued in 2004-05. Implementation of these schemes has impacted on area, production and yield.

Table - 5: Area, Production and Yield rate of Horticultural Crops

Crop	Area (lakh hectares)			Production (lakh tonnes)			Yield (tonnes / ha.)		
	2002-03	2003-04	2004-05*	2002-03	2003-04	2004-05*	2002-03	2003-04	2004-05*
Fruits	2.23	2.21	2.39	40.14	36.09	39.08	17.96	16.33	16.37
Vege-tables	1.62	1.91	2.06	35.99	46.73	50.59	22.25	24.47	24.53
Spices & condiments	1.46	1.54	1.67	6.25	6.93	7.50	4.27	4.49	4.50
Plantation crops	2.28	2.34	2.53	7.95	8.02	8.68	3.49	3.43	3.44
Flowers	0.18**	0.20	0.22	1.35	1.62	1.75	7.65	7.97	7.99
Medicinal plants	@	0.04	0.04	0.02	0.08	0.08	--	1.90	1.90
Total	7.77	8.25	8.91	91.70	99.46	107.68	11.80	12.06	12.09

* - Projected; **Negligible (less than 1000 kgs.) - @ Less than 100 ha..

Source: Directorate of Horticulture and Plantation Crops, Chennai - 5

The State has an estimated 130 million hectares of coastal land. Of which 33 million hectares are available for reclamation. This programme aims at transforming the rural economy by providing employment opportunities to agricultural labour and the rural poor. The crops like Sweet Sorghum and Jatropha offer tremendous opportunities to farmers and improve their income and standard of life. The Sweet Sorghum crops needs 40 per cent of normal water-consuming crops and provides an average yield of 30 tonnes per acre and realises Rs.10000/- per acre as net income within four months. Similarly, Jatropha, a hard shrub, gives attractive yield for 30 years and thereby could fetch more than Rs.12000 per acre from the third year of cultivation.

Sericulture:

Sericulture has potential for employment and income generation. The productivity of silk production depends mainly on the quality of silk worms. The cocoon and raw silk production has been carried out in 26 districts in the State. The improved bivoltine races are being introduced in the State to improve yield rate and fetch higher income to the farmers. In terms of the cocoon and raw-silk production, five districts, namely, Dharmapuri (50.3%), Vellore (12.7%), Erode (10.6%), Coimbatore (6.7%) and Namakkal (3.7%) constitute a high share (85%) out of the total area coverage of 13486 ha. in Tamilnadu.

The average yield of cocoons per 100 laying which prevailed at the end of IX Five Year Plan (2001-02) increased to 58.4 kgs. in 2004-05 (upto February 05) during the X Five Year Plan period. Tamil Nadu is also a major silk consuming State and the estimated requirement of silk would be 1500 metric Tonnes per year. The silk industry in the State is also in the process of adjusting itself to the changing requirements in post WTO. Marketing and branding initiatives like the Silk Mark also help in developing the market for silk products.

Agricultural Marketing:

Empowerment of farmers through what is called *disintermediation*; in other words, eliminating the middlemen, common agents in marketing agricultural produce is essential. Because of revolution in Information and Communication Technology, E-commerce has been gaining momentum. Agricultural marketing is the process of encompassing all the steps involved from the producer to consumer including pre-and-post harvest processes such as assembling, grading, storage, transportation and distribution. Promotion of standardisation and grading of agricultural products is the main function under institutionalised agricultural marketing. An effective quality control mechanism is imperative for improving the marketability of products.

Demand influences the prices of agricultural produce to a great extent rather than supply conditions since market period is very short. As a result, farmers become more vulnerable to price fluctuations. Therefore, farmers need easy access to well-built market net work on a regular basis to secure better price for their produce.

In order to market agricultural produce, the Market Committee Act 1959 was amended as the Tamil Nadu Agricultural Marketing (Regulation) Act 1987. It was brought into force from 1.2.1991. At present there are 20 Market Committees with 273 Regulated Markets and 15 sub-markets covering the entire State except Chennai and Nilgiris districts. The strategy is to enable the farmers to realise a remunerative price for the produce on one hand and on the other to enable the consumer to buy agricultural produce at reasonable prices. To promote agricultural exports from Tamil Nadu three Agri-Export Zone (AEZ) one for cut flower at Hosur, Dharmapuri district, second for flowers at Ooty, Nilgiris district and third for mango in Theni and 5 other districts has been established at a total cost of Rs.65.34 crores. It is also proposed to establish a AEZ exclusively for cashew at Cuddalore district through private sector participation at a project cost of Rs.10.36 crores.

Under this marketing network, forty important agricultural commodities are brought under the fold of the Marketing Co-operatives to sell the commodities through 273 regulated markets, 96 commercial grading centres, 11 kapas grading centres, one tobacco - grading centre. Total value of agricultural produce sold by agricultural marketing co-operatives during 2004-05 was at Rs.307.26 crores which is moderately lesser than in 2003-04. Sugarcane gur and cotton are the major commodities traded through the regulated markets.

Table -6: Value of Agricultural Produce Sold by Marketing Cooperatives
(Rs. crores)

Sl. No.	Crop	2001-02	2002-03	2003-04	2004-05
1.	Foodgrains	24.75	40.44	38.73	35.98
2.	Cotton	116.71	92.51	90.43	94.59
3.	Chillies	1.53	1.56	2.81	2.81
4.	Coffee	-	-	-	-
5.	Sugarcane gur	150.78	138.34	92.72	79.74
6.	Species / Spices	0.37	1.93	0.11	*
7.	Oilseeds	24.62	15.11	16.09	13.06
8.	Others	112.35	120.17	100.10	81.08
	Total	431.11	410.06	340.87	307.26

Source: The Registrar of Cooperatives, Chennai - 10. * - Included in others.

Loss of Agricultural Production due to Natural Calamities:

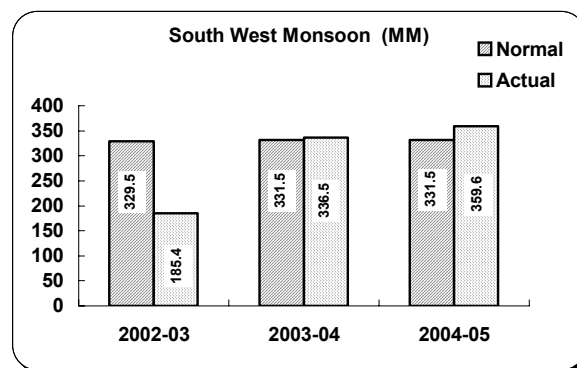
Crop loss often occurs invariably in the State because of either drought or flood. The crop loss due to drought was mainly attributed to the vagaries of monsoon and lack of timely release and mandated quantum of water from neighbouring Karnataka State during water crisis in the State in consecutive three year period - 2001-02, 2002-03 and 2003-04. The estimated food crop loss because of drought was at 108.13 tonnes during 2003-04 - 47.79 tonnes food crops and non-food crops 60.34 tonnes. Total area sown and production of the crops like paddy and cotton during the rabi season affected by drought was of the order of 2.69 lakh ha. and 12.12 lakh tonnes with the result the value of loss of these crops was to the tune of Rs.668.24 crores during 2003-04 in the State. Tsunami has tended to adversely impact on the fishery sector during 2004-05.

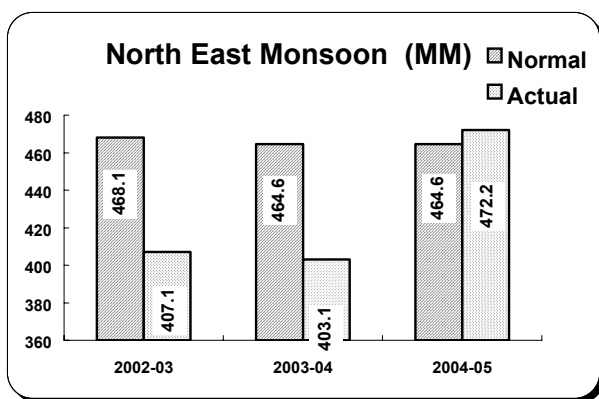
Input Management:

The role of Government has changed from owner and sole provider to that of a facilitator and enabler. Agricultural inputs play an important role in accelerating the growth of agriculture production and yield rate. Adoption of HYVs coupled with application of fertilisers, weedicides, pesticides, agricultural credit and extension efforts influence crop yield and production. Favourable spatio-temporal distribution of rainfall is sine quo non of creditable agricultural performance. In view of the fact that scope for the extensive cultivation is limited, the State has to concentrate on intensive cultivation to ensure both food and livelihood security.

Rainfall

The State agricultural production and productivity is critically influenced by the quantum, spread and timely onset of south west and north east monsoons. The State gets relatively more rainfall during north east monsoon, especially, in the coastal regions. The normal rainfall in south west and north east monsoon is around 322 mm and 470 mm which is lower than the National normal rainfall of 1250 mm. Similarly, the per capita water availability of the State is 800 cubic meters which is lower than the National average of 2300 cubic meters. However, the EL-Nino factor of Pacific





Ocean, environmental degradation, injury to stratospheric ozone because of global warming and green house effect and climate change plausibly accounted for the low quantum of rainfall in the State. The Mettur dam was thrown open for irrigation on 12th August 2004 at 9.20 a.m. during 2004-05. Thanks to the efforts of the Government, a quantum of 12000 cusecs (1 tmc.) was released on this date with an initial discharge of 4000 cu.secs and later on it was augmented.

This paved the way for raising samba crop in the delta districts viz. Thanjavur, Thiruvarur and Nagapattinam.

Overall deficit was in the order of 7.6 per cent in 2003-04, 24.2 per cent in 2002-03 and 18.4 per cent in 2001-02 from the normal precipitation of 961.8 mm., 964.1 mm. and 974.7 mm. respectively. This is the principal causative factor for poor performance of agriculture. The South West Monsoon (June - Sept) in the State recovered from the deficient level of 43.7 per cent (185.4 mm) in 2002-03 to 1.5 per cent (336.5mm) in 2003-04 and improved to 8.6 per cent in 2004-05 (359.6 mm.) against the normal level of 331.5 mm. The total average rainfall received during the monsoon in 2004-05 stood at 359.65 mm. showing a rise of 6.9 per cent over the previous year's level of 336.5 mm. in the State. The south-west monsoon during 2004-05 was excess in 13 districts, normal in 14 districts and deficient in only two districts. The North East Monsoon set in on time in the State.

The spatio-temporal distribution of rainfall of North East Monsoon (Oct.-Dec.) was deficient by 13.2 per cent in 2003-04 compared to the shortfall of 13 per cent during 2002-03 and this was regained and improved to 1.6 per cent in 2004-05. The quantum and spread of rainfall during this season brought about 472.23 mm. in 2004-05 and this was more than 17.1 per cent over the previous year's level of 403.1 mm. in the State. The monsoon during this season was excess in 7 districts, normal in 14 districts and deficient in 8 districts in the State showed a welcome improvement over the previous year 2003-04. This offers good scope for projected increased production of food grains in the State.

Table - 7: Temporal Spread of Rainfall

Year	South west Monsoon		North - East Monsoon		Overall	
	Normal	Actual	Normal	Actual	Normal	Actual
2001-02	322.8	260.0 (-)19.5	470.4	379.4 (-)19.3	974.7	795.2 (-)18.4
2002-03	329.5	185.4 (-)43.7	468.1	407.1 (-)13.0	964.1	731.0 (-)24.2
2003-04	331.5	336.5 (1.5)	464.6	403.1 (-)13.2	961.8	1034.6 (7.6)
2004-05	331.5	359.6 (8.5)	464.6	472.2 (1.6)	-	-

Source: 1. India Meteorological Department Chennai - 600 006. 2. Directorate of Economics and Statistics, Chennai-6.

Because the quantum of rain fell short of the normal rainfall for three years in succession, there is a wide gap between the capacity of the reservoir and actual quantum of water storage, as seen from the table below:

Table – 8: Storage Position of Major Reservoirs

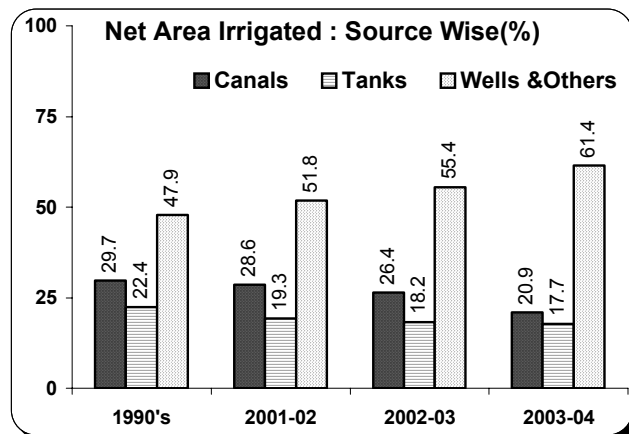
Reservoir	Full Capacity (Tmcft)	Storage (%)	
		As on 31.1.2003	As on 31.1.2004
1. Mettur	93.5	7.80	8.35
2. Bhavanisagar	32.8	8.55	3.85
3. Periyar	10.6	9.67	9.82
4. Sathanur	7.3	17.81	18.75
5. Vaigai	6.1	16.33	10.01
6. Manimuthar	5.5	61.86	41.93
7. Papanasam	5.5	37.56	24.89
8. Peachiparai	4.5	24.92	4.47
9. Amaravathy	4.0	15.05	11.02
10. Perunchani	2.9	13.08	3.74
11. Krishnagiri	1.7	29.47	27.85

Source: *Monthly Review of Tamil Nadu Economy, January 2004, Directorate of Economics and Statistics, Chennai – 6.*

It may be mentioned that the continued intransigence by the Government of Karnataka in honouring the Award of the Cauvery Tribunal had adversely impacted upon the farm prospects in the recent past.

Irrigation:

The irrigation potential of the State has already been realised. Per capita availability of water is lowest in Tamil Nadu. As per the World Bank reports, the per capita availability of water resources in the State is 900 cubic metres (40.9%) in a year as against 2200 cubic metres in India. Well irrigation is dominant in Tamil Nadu. Of the 1.8 million wells, approximately 10 per cent are defunct. The depth of bore wells in hard rock is between 600 and 1000 ft.



This situation tend to the water management as the key to the priority area both for the farmers and implementing authority. It further focused on area of efficient water management and crop diversification imperative in the place of highly water intensive crops like paddy and sugarcane in the State. Above all, it further give due respect on decisive steps to reinvigorate agricultural growth to contain poverty and enhance rural purchasing power in the State.

An additional irrigation potential of 2323 hectares had been created during 2003-04. It had the scope for further creation of irrigation potential of 7573 hectares during 2004-05 because of the comprehensive measures taken by the Government in the State. Gross area irrigated as per cent of gross cropped area was in the order of 55 per cent in 2001-02, 50 per cent in 2002-03 and 47 per cent in 2003-04. Despite the fact that the irrigated area accounts for about 50 per cent in normal times, this low percentage in 2003-04 is due to failure of monsoon for third year in a row. It is indicative of the fact that the fortune of agriculture still significantly relies on quantum and spread of precipitation. Of the irrigated area, the share of wells is 60.5 per cent, canals 20.9 per cent, tanks 17.9 per cent and others 0.7 per cent during 2003-04. Irrigation by canals has been influenced by factors such as the flow of Cauvery river to a great extent. So the dependence on ground water has been increasing causing rapid depletion of availability of ground water. The Government of Karnataka had

refused to release the water to Mettur reservoir as per the interim award of Cauvery Water Disputes Tribunal. This aggravated and worsened the situation in delta region.

The problem of salinity and alkalinity of the soil is posing additional problems. In this scenario, micro irrigation techniques viz., drip and sprinkler irrigation and *precision farming* are becoming increasingly relevant and hence the Government is stepping up investment in these areas. Crop-wise, the paddy crop accounted for 50.9 per cent and food and non-food crops 76.2 per cent and 23.8 per cent respectively in 2003-04 out of the total irrigated area of 24.8 lakh hectares.

Table - 9 : Irrigation Profile - Tamil Nadu

Item	2001-02	2002-03	2003-04
Total rainfall	795.2	731.0	1034.6
Net area irrigated (lakh ha.)	28.0	23.1	21.5
Canals	8.0	6.1	4.5
Tanks	5.4	4.2	3.8
Wells (tube and ordinary wells)	14.5	12.6	13.0
Others	0.1	0.2	0.2
Gross area irrigated (lakh ha.)	34.1	26.2	24.8
Net area sown (lakh ha.)	51.7	45.9	46.9
Gross cropped area (lakh ha.)	62.3	51.9	53.2
Irrigation intensity (%)	121.8	113.4	115.3
Cropping intensity (%)	120.4	113.1	113.4
Net area irrigated as percentage to net area sown	54.2	50.3	45.8
Gross area irrigated as a % to gross cropped area	55.0	50.5	46.6
Total foodgrains production (lakh tonnes)	76.89	44.60	43.12

Source: Season and Crop Report, Directorate of Economics and Statistics, Chennai-6.

Water Resources Consolidation Project:

Tamil Nadu Water Resources Consolidation Project (Phase-I) was taken up in 1995 with the financial assistance of World Bank at an estimated cost of Rs.11433 million and the project was completed on 30.9.2004.

The core objectives of the Project are:

- to introduce Water Resources Planning by river basins across all uses of water;
- to improve agricultural productivity through modernisation and completion of irrigation system, upgraded water management and farmers participation;
- to assure sustainability of water infrastructure and the environment; and
- to improve Institutional and Technical Capacity for managing the State Water Resources.

A macro level planning have been completed for 16 basins out of 17 basins in the State leaving the Cauvery river basins due to water dispute on sharing of water. The Water Resources Management Project was also piloted in the Hanumanadi sub basin of Tamirabarani.

The Water Resources Consolidation Project (Phase-II) was taken up to improve the overall efficiency and the storage capacity of the State's meager water resources with World Bank assistance at an estimated cost of Rs.2890 crores in the State. This Project included

certain left out items of Water Resources Management Project (Phase-I). It aims at the rehabilitation of System and non- System tanks and irrigation schemes both new and ongoing schemes. It also aims at taking up Eco-restoration works, conjunctive use of Ground and Surface Water Development in Sivaganga and Pudukottai districts. This Project will focus on Integrated Approach with participation of line Departments using water and also choosing Hanumanadi sub- basin guide. Further in Phase II about 3392 rain fed tanks are proposed to be rehabilitated at a cost of Rs.542.60 crores covering 17 basins in 19 districts in the State.

Box

Strategy for the Development of Hanumanadhi River Basin

Multi Disciplinary Project (MDP) with Integrated Water Resources Management (IWRM). The strategy focuses on convergence of the following Agencies / Departments.

1. Water Resources Organisation
2. Agricultural Engineering
3. Agriculture
4. TNAU
5. Agricultural Marketing
6. Horticulture
7. Animal Husbandry and Fisheries
8. Environment & Forests
9. Social Welfare

OPTIONS

- To go for rain water harvesting
- Introduce micro irrigation with fertigation in a large scale.
- Introduce high tech farming with post harvest techniques
- Ensure protection of farm produce till it reaches the consumers.
- Consumption of Water for Agriculture which is 80% to be reduced by adopting conveyance efficient techniques like Micro irrigation, pressure irrigation and flow irrigation using pipes
- Increase the storage condition of aquifer by providing farm ponds and rejuvenation of wells etc.
- Adopting cropping practices and tilling practices to reduce water consumption and increasing the yield per hectare by using less water.

Source: Round Table Discussion on Agriculture Diversification and Water Resources Management (19th May, 2005).

Power Supply to Farmers:

Power is one of the strategic variables in the development of agriculture. The scheme of free supply of power to marginal farmers was implemented in 1984-85 and small farmers from 1.8.1989 in State. All the farmers were supplied free power from 1.9.1991 on a blanket basis. The extension of free supply of power to the extent of 30 per cent to the farming community has involved a sizable subsidy of Rs.1776.39 crores to government in 1999-00. The Government has taken special initiatives to ensure the regular supply of power to the farmers at the same time ensuring that the finances of the electricity boards are competently managed.

Seed:

Sustained increase in agriculture production depends on the development of new improved varieties of seed and an efficient system for supply of quality seeds to farmers. Seed is an essential input in the process of agricultural production. The productivity of crops largely depends on the genetic and physical purity of the seeds. The foundation seed production has been carried on through the 39 State Seed Farms, five State Oilseed Farms and one Pulses Seed Farm.

The breeder seeds supplied by Tamil Nadu Agriculture University (TNAU) were multiplied as certified seed in these farms. The Agriculture Department had taken concrete initiatives on the production and distribution of certified seeds. A 10-point Action Plan has been prepared to supply farmers with quality seeds at the right place, at the right time and at the right price.

The paddy seeds supply had come down from 15483 tonnes (13.9%) in 2002-03 to 12985 tonnes (23.6%), followed by millets 363 tonnes (8.3%) to 351 tonnes (12.2%) and foodgrains from 19300 tonnes (20.1%) to 14424 tonnes (25.3%) towards the targets in 2003-04. However, seed supply of non-foodgrains has dropped from 53.4 percent in 2002-03 to 34.5 percent in 2003-04. The decline in the distribution of certified seeds was mainly attributed to low precipitation received during 2003-04. However, the production and distribution of seeds during 2004-05 (upto 2004) witnessed an achievement of more than 45 per cent against the target. In view of the good precipitation that had occurred during the South West and North East monsoon period in the State during 2004-05, there is scope for improvement in the production and distribution of seeds, especially, for the crops viz. paddy, millets, pulses, food and non-food crops during 2004-05.

Table – 10 : Distribution of Improved Seed

Crops	2002-03		2003-04		2004-05 (Upto October 2004)		% deviation from the target	
	Target	Achievement	Target	Achievement	Target	Achievement	2002-03	2003-04
Paddy	18000	15483	17000	12985	17000	8296	(-)13.9	(-)23.6
Millets	400	363	400	351	400	187	(-)8.3	(-)12.2
Pulses	2600	942	1900	1088	1900	589	(-)63.8	(-)33.0
Food-grains	21000	16788	19300	14424	19301	9072	(-)20.1	(-)24.3
Oil-seeds	9097	4266	4654	3125	8441	1732	(-)53.1	(-)32.8
Cotton	322	124	375	164	367	62	(-)61.5	(-)42.4
Non-food-grains	9419	4395	5029	3289	8808	1794	(-)53.4	(-)33.4

Source: 1. Policy note on Agriculture, 2004-05, 2. Commissioner of Agriculture, Chennai - 5.

As compared to the previous year (2003-04) the target fixed in the distribution of seeds for the crops viz. cumbu (154 tonnes), ragi (129 tonnes), groundnut (8190 tonnes) had improved by 23.2 per cent, 12.2 per cent and 88.8 per cent respectively during 2004-05. The achievement upto October 04 (first quarter July to October) showed an improvement in the production and distribution of seeds like paddy (8296 tonnes), coarse cereals (187 tonnes), groundnut (1685 tonnes), sunflower (17 tonnes), cashew (8 tonnes) and soyabeans (0.52 tonnes) etc. in 2004-05.

One of the methods to address the problem of plateauing outputs is to change the pattern of input application, particularly, seeds. The challenge is to use seeds that are drought-and pest-resistant besides being high-yielding strains. GM seeds are being distributed through private firms for commercial cultivation. Currently, HYVs species are being widely used in respect of paddy crop. Other crops also need special focus in this regard in future agricultural growth strategy.

Seed Replacement Rate:

Seed replacement is essential for increasing the agriculture production and productivity. The seed replacement rate for different crops can be seen from table below:

Table -11 : Seed Replacement Rate of Select Crops : 2003-04 & 2004-05

Sl.No.	Crop	Seed Replacement Rate in (%)
1.	Paddy	17
2.	Millets	7
3.	Pulses	12.5
4.	Cotton - Rainfed Cotton - Irrigated	10 15
5.	Groundnut	5
6.	Gingelly	15
7.	Sunflower	50
8.	Castor	30
9.	Soyabean	20

Source: Policy note on Agriculture, 2004-05.

Fertiliser:

The application of essential plant nutrients such as nitrogen, phosphorus and potassium in the right proportion is imperative. Balanced nutrient use would enrich the soil such as red loam and laterite, black, alluvial and saline and thereby improve crop yield rate. Balanced nutrition for better crop health needs application of NPK in the right proposition. The agricultural crops need to be provided with the correct 4:2:1 ratio of balanced nutrients. However, it has been noticed that many farmers do not apply the balanced nutrients to plant and this is reflected by a drop in crop production and yield rate compared to latent potential. There is thus over dose of nitrogen and under-application of phosphate and potassium. The fertilizer consumption (NPK) had gradually declined from 9.38 lakh tonnes in 2001-02 to 7.43 (-20.8%) in 2002-03, 7.13 lakh tonnes in 2003-04 but there was slight increase in consumption in 2004-05 to 9.52 lakh tones.

Table - 12 : Distribution of Chemical Fertilisers
(Lakh Tonnes)

Nutrients	2002-03	2003-04	2004-05
Nitrogen (N)	4.20	3.78	4.83
Phosphates (P)	1.51	1.59	2.11
Potash (K)	1.72	1.76	2.58
Total	7.43	7.13	9.52

Source: Commissioner of Agriculture, Chennai-5.

Bio-fertiliser:

Bio-fertilizers are environmentally friendly whereas the fertilisation of soil with artificial chemicals tends to cause ecological and environmental damage. The use of bio-fertilizer is becoming increasingly important for seed treatment, nursery and main crop. It alleviates the

Table - 13: Bio-Fertilizers Distributed
(Metric Tonnes)

Type	2002-03	2003-04	2004-05
Rhizobium	390	208	270
Azospirillum	712	729	710
Phosphobacteria	192	375	205
Total	1294	1312	1185

Source: 1. Policy note on Agriculture, 2004-05. 2. Commissioner of Agriculture, Chennai - 5.

chemical content of the soil and helps in the production of chemical-free food crops. Application of bio-fertiliser reduces the requirement of chemical fertiliser and thereby minimises the cost of cultivation. It is cost-effective. The use of bio-fertilizer promotes balanced use of mineral fertilizers in conjunction with organic manure and green manure. It is environmentally-friendly. The bio-fertiliser consumption such as rhizobium, azospirillum and phosphobacterium put together accounted for 1428 metric tonnes in 2001-02. It had decelerated by 9.4 per cent to 1294 metric tonnes in 2002-03. However, this distribution had improved by 1.4 per cent to 1312 metric tonnes in 2003-04 followed by a dip (9.67%) 1185 metric tonnes witnessed during 2004-05. There is also a nascent but growing market for organically produced crops and vegetables.

Plant Protection:

Integrated Pest Management (IPM) is being adopted in the State for effective and eco-friendly pest and disease management under plant protection. The farmers were given training regarding the identification of predators and stamp out them. This has made the farmers aware of the need to adopt the IPM technology to minimise the pesticides consumption and thereby save about 20 per cent of the crop loss due to pest and disease.

During 2003-04, plant protection measures such as pest and disease management were carried out in the State. The pest management was carried out to the extent of 32.78 lakh ha. pest treatment under food crops and 17.7 lakh ha. under non-food crops. The area covered under disease treatment was of the order of 16.9 lakh ha. (food crops) and 9.2 lakh ha. (non-food crops) in 2003-04. Under Integrated Pest Management, the IP on demonstration has been carried out through Centrally Sponsored Schemes, Cotton Mini Mission II, Accelerated Maize Development Programme, Oilseeds Production Programme and National Pulses Development Project. It was of the order of 1500 nos., 70 nos., 30 nos., 1669 nos. and 536 nos. during 2003-04. During this period, the pest control measures such as seed treatment (26.4 lakh ha.) rat control (0.2 lakh ha.), weed control (0.2 lakh ha.) had been covered. The plant protection with regard to pest control is expected to improve by treating 12.4 lakh ha. for food crops and 8.0 lakh ha. for non-food crops during 2004-05 (upto October 2004). Disease control measures for food crops stood at 6.7 lakh ha. and non-food crops to 4.8 lakh ha. (upto October 2004) in 2004-05

Command Area Development & Water Management Programme :

The Centrally- Sponsored Command Area Development & Water Management Programme aimed at improving irrigation in agriculture by means of On-Farm Development works (OFD) and Rotational Water Supply (RWS). The expenditure incurred under this programme is shared equally between the Centre and State. This programme had been implemented in nine commands during 2002-03 and 2003-04. The achievement was of the order of 0.57lakh ha. and 0.56 lakh ha. under OFD works and 0.75 lakh ha and 1.10 lakh ha. under RWS works in the respective years. The corresponding expenditure on OFD and RWS stood at Rs.4524.08 lakhs and Rs.4653.7 lakhs excluding the expenditure of Technical Cell.. Cauvery and Parambikulam Aliyar Commands together accounted for more than 80 per cent of the area benefited under both OFD and RWS works during 2002-03 and 2003-04

Table - 14 : Command Area Development & Water Management Programme

Commands	On Farm Development Works				Rotational Water Supply			
	Expenditure (Rs. lakhs)		Area benefited (Hectares)		Expenditure (Rs. lakhs)		Area benefited (Hectares)	
	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05
Cauvery	2212.7	633.1	32706	7127	258.9	-	87181	66
Parambikulam Aliyar	1134.8	295.5	12130	1380	36.0	-	12453	100
Amaravathy	8.1	-	-	-	-	-	-	-
Tambiraparani	530.4	146.2	5784	-	14.9	0.9	5260	987
Thoppaiyur	55.6	3.5	573	2694	2.7	-	936	1
Krishnagiri	169.8	47.8	2012	-	5.9	0.8	2039	291
Palar Porandalar	216.4	89.2	2513	262	7.5	-	2529	504
Periyar Vaigai	-	-	-	703	-	-	-	-
Total	4327.8	1215.3	55718	12166	325.9	1.7	110398	1949

Note: Technical Cell, 2002-03 and 2003-04 excluded. No area covered under Kodaiyar Chittar Patta-namkal

Source: Agricultural Engineering Department, Chennai - 35.

Plan Expenditure:

Public investment in agriculture has been declining through time. The Plan-wise funds earmarked for agriculture and allied services came down during the Fifth Five Year Plan in absolute terms. A glance through the time-series data discloses that there were variations in the relative share of resources flowed to agriculture and allied activities. On an average, about one-fifth of the aggregate Plan expenditure had gone to this sector. The share peaked at 21.47 per cent during the Third Five Year Plan. About one-fifth of the tenth plan allocation has been earmarked for agriculture and allied activities. There is an almost universal realisation that public investment in agriculture requires to be stepped up. In this sector, infrastructure investment requires greater attention even within the limited fiscal space that is available.

Table - 15 : Plan Expenditure

(Rs. in crores)

Plan	Agriculture and Allied Activities	Percentage
First Plan (1951-56)	9.57	11.90
Second Plan (1956-61)	30.62	16.31
Third Plan (1961-66)	74.53	21.47
Fourth Plan (1969-74)	103.75	18.56
Fifth Plan (1974-78)	93.28	11.18
Sixth Plan (1980-85)	707.88	19.42
Seventh Plan (1985-90)	938.14	14.85
Eighth Plan (1992-97)	2510.71	17.91
Ninth Plan (1997-2002)	4851.39	19.47
Tenth Plan (2002-2007)	7989.75	19.97

Source: Annual Plan Document, 2003-04, State Planning Commission.

Crop Insurance:

One of the challenges faced by the agriculture sector is the question of risk management because to this day agriculture remains a gamble in monsoon. Crop insurance is one of the instruments for protecting farmers from agricultural variability, mainly weather-induced. A Comprehensive Crop Insurance Scheme (CCIS) was implemented during the 1985-1999 period. The General Insurance Company (GIC) in collaboration with the state governments as co-insurers was implementing this scheme in the ratio of 2:1. The premium was 2 per cent of the sum insured for the paddy, wheat, millets and one per cent for oilseeds and pulses. Fifty per cent of the premium payable by the small and marginal farmers was subsidised jointly by the Central and State governments on the basis of 50:50 (RBI 1986-87). For improving the scope and content of CCIS, a broad based Central sector scheme, National Agricultural Insurance Scheme (NAIS) called Rashtriya Krishi Bima Yojana was introduced from the rabi season of 1999-2000. The scheme is available to all farmers (both loanee and non-loanee) irrespective of the size of their land holdings. Under the scheme comprehensive risk insurance is provided to cover losses arising due to non-preventable risks viz., natural fire and lightning, storm, hailstorm, cyclone, flood,

inundation and landslide, drought, dry spells, pest diseases etc. It covers a wide range of crops including food crops, oilseeds and annual commercial / horticultural crops. At present, 23 states and two Union Territories are implementing the scheme. The basic limitation of the scheme is that it covers only a small fraction of the eligible cropped area or the number of farmers and has a very high claims to premium ratio.

In Tamil Nadu the National Agricultural Insurance Scheme is being implemented from Kharif 2000. The State Level Coordination Committee on Crop Insurance for monitoring National Agricultural Insurance Scheme notify the crops and blocks to be covered:

The modalities of the schemes as implemented in Tamil Nadu are that the small and marginal farmers insuring their crops are given 50% of premium subsidy under the schemes for the year 2000-01. From the subsequent years, the subsidy portion is being reduced in a phased manner. The percentage of subsidy is 40% for the year 2001-02, 30% for the year 2002-03, 20% for the year 2003-04 and 10% for the year 2004-05.

Under the scheme both loanee and non-loanee farmers are covered. The total number of farmers covered under the scheme was 1.64 lakhs in 2001-02 covering an extent of 2.49 lakh hectare. It went down to 0.87 lakh farmers (1.47 lakh ha.) in 2002-03 and 0.66 lakh in 2003-04. The sum assured had also witnessed a declining trend to the tune of Rs.19648.13 lakhs in 2001-02, Rs.12767.72 lakhs in 2002-03 and Rs.10420.96 lakhs in 2003-04. Premium collected towards the sum insured was of the order of Rs.392.44 lakhs, Rs.258.76 lakhs and Rs.212.36 lakhs respectively. However, the total claims disbursed had increased from Rs.1662.59 lakhs in 2001-02 to Rs.3405.18 lakhs in 2002-03. However, it had come down to Rs.892.35 lakhs in 2003-04. It benefited 69153, 61487 and 16447 number of beneficiaries respectively. The Government of India had requested the State Government to create Corpus Fund with contribution for GOI and State Government on 50:50 basis under this scheme.

Table - 16 : Crop Insurance Claim Details - Tamil Nadu

Year	No. of farmers covered (lakh)	Extent of Area (lakh ha.)	Sum assured (Rs. lakhs)	Premium collected (Rs. lakhs)	Claim amount disbursed (Rs. lakhs)
2001-02	1.64	2.49	19648.13	392.44	1662.59
2002-03	0.87	1.47	12767.72	258.76	3405.18
2003-04	0.66	1.03	10420.96	212.36	892.35

Source: Registrar of Cooperative Societies, Chennai 10.

One main factor inhibiting the effective working of the Crop Insurance Scheme is that claims were many times higher than the premium collected.

Rain Water Harvesting:

Rain Water Harvesting was recently introduced in the State for direct collection of water. Rainwater could be stored either for direct use or recharged in to the ground water aquifer for use. The Rain Water Harvesting method viz. Roof-top Harvesting and Roof-top/Open Space Harvesting are being adopted in the State. This could augment rainwater into open and bore wells and thereby improve the ground water recharge and meet the demand for water during water crisis. The Metro Water Board and TWAD Board have constituted exclusive RWH Units. The Rain Water Harvesting concept has also become mandatory and implemented in the State with the following basic objectives.

- To conserve and augment the storage of ground water by creating awareness among public;
- To reduce water table depletion by participating various agencies;

- To improve the quality of ground water by imparting training to individuals/organisations/Government Agencies;
- To arrest sea water intrusion in coastal areas and offer technical guidance and assistance based on the geological formations;
- To avoid flood and water stagnation in urban areas and to promote R.W.H. both in individual and in public places and
- To control formation of cracks on walls and also to assure proper maintenance of the harvesting structures after installation.

The State had created Rain Water Harvesting structures through the departments like Highways, Rural Development, Municipal Administration and Water Supply, Tourism Development Corporation and Hindu Religious and Charitable Endowment, Agriculture and School Education. Under this campaign, a total number of 257.76 lakh Water Harvesting Structures were constructed in the State. Of these structures, structure created by Agricultural Engineering Department were for the purpose of augmenting rain water into wells and farm ponds. The R.W.H structures for agricultural purpose accounted for 1.41 lakh numbers. out of the total 257.76 lakh numbers.

The State Government initiative in implementing the Rain Water Harvesting as a multi-pronged strategy is being adopted under Government's 15-Point Programme to ensure water security to the State's entire population. It was emphasised to save every drop of water for safe drinking and other purposes like agriculture, industry, Government offices, schools, hospitals, buildings made mandatory in the State.

Area Development:

Since land resources are scarce, the Government has been embarking on implementing development of wasteland. Towards this end, the Department of Agriculture has been implementing two programmes viz. Comprehensive Wasteland Programme (CWLP) and the National Watershed Development Project for Rainfed Areas (NWDPPA).

Comprehensive Wasteland Programme, 2001-02:

There are two components under this programme - Participatory Watershed Development and Development of public Wastelands by Corporate houses, small companies and Federation of Women-run SHGs. Two components are being implemented on a micro watershed approach.

Participatory Watershed Development:

Under participatory watershed development a subsidy of Rs.8500/- is being provided per ha. In 2002-03 this component was implemented in 10 districts covering a target of 55000 hectare as a pilot basis with a fund of Rs.30 crores. However, an area of 21771 ha. was tackled and 23.66 lakh seedlings (15.39 lakh agro-forestry and 8.27 horticulture) were planted.

Encouraged by the positive impact made by the programme, it was extended to another 13 districts* with a targeted coverage of 50000 ha. and financial assistance of Rs.25 crores in 2003-04. During this period an area of 23600 hectares has been covered in ten pilot districts and planted 2500067 seedlings including 687013 agro forestry and 1813054

* Tuticorin, Virudhunagar, Sivagangai, Madurai, Coimbatore, Erode, Karur, Perambalur, Villupuram, Cuddalore, Thiruvallur, Dharmapuri and Kancheepuram.

horticulture in the State. Actually an area of 23600 ha. was covered in the first 10 pilot districts. Total seedlings of 25 lakhs were planted. In the newly covered 13 districts preliminary works such as formation of District Watershed Development Agency, selection of NGOs, registration of Village Development Association, etc. had been completed. Agro-forestry and horticultural crops are being given importance. Pro-active measures had been taken to augment the supply of seedlings recommended. During 2004-05, this programme is being implemented in the State in 23 districts covered 60,000 ha. of which 54,000 ha. meant for tree seedlings and 6000 ha. for fodder crops.

Leasing of Waste Lands:

The component of leasing of Government Wastelands to Corporate Houses has been in operation since 2002-03 in all districts save Chennai, Kanniyakumari and the Nilgiris districts. Blocks of land less than 8 ha. and above had been identified for leasing. These areas identified are being leased to corporate houses, small companies, co-operative societies and federation of women SHGs for a period of 30 years.

Applications are being scrutinised and cleared by the District Committee with regard to less than 8 ha. block. For block of land more than 8 ha. the District Committee recommended the eligible firms to a high level committee at the State level. So far an area of 1054 ha. had been leased. The MOU was communicated to all District Collectors for signing with the firms concerned.

National Watershed Development Project for Rainfed Areas:

It is a Centrally-sponsored scheme focusing on production of bio-mass and restoration of ecological balance with adoption of watershed approach. 84 Blocks spread over 19 districts** were under the scheme. Since the advent of the scheme an area of 2.27 lakh ha. had been treated entailing a cost of Rs.73 crores.

The scheme has been restructured in order to adopt "*Watershed Areas rainfed agricultural systems approach*" during the X Plan period. This novel approach has made Village Watershed Committees mandatory to plan, implement, monitor and maintain the watersheds. Objectives of this restructured scheme are fostering natural resources, stepping agricultural productivity, protect ecological balance and creating gainful employment. Cost of this scheme is shared between Government of India and Government of Tamil Nadu on 90:10 basis. Of the total Central assistance 80 per cent is grant and 20 per cent is loan.

The scheme is being executed in all blocks having less than 30 per cent of assured irrigation both in arable and non-arable lands in 23 districts save Thanjavur, Nagapattinam, Thiruvarur, Kanniyakumari, Nilgiris, Chennai and Krishnagiri. For lands having less than 8 per cent slope, the unit cost per ha. is Rs.4500/- and for lands having more than 8 per cent

** Cuddalore, Villupuram, Vellore, Thiruvannamalai, Salem, Namakkal, Dharmapuri, Coimbatore, Erode, Tiruchy, Karur, Perambalur, Pudukkottai, Madurai, Theni, Dindigul, Sivagangai, Virudhunagar and Thirunelveli.

slope, the unit cost is fixed at Rs.6000. It is proposed to treat an area of 3.82 lakh ha in 763 micro watersheds (500 ha. each) in 23 districts during the 10th Five Year Plan period.

The challenges facing agriculture have been clearly identified and solution points to the imperatives of crop diversification, improved water management promote horticulture development and strengthen food processing.

Agriculture as major employment provider:

Agriculture continues to be the main stay for rural workers. Despite an absolute reduction in farm employment over the years, there is increase in the share of both male and female employment in agriculture crop production during the post-reform period compared to the pre-reform period in Tamil Nadu. While share of male employment in field crop production activities rose to 91 per cent from 88 per cent, that of rural women employment in the same activity rose to 85.4 per cent from 83 per cent. In terms of employment absorption livestock activity followed with a share of 8.7 per cent for women employment. At the all India level there was relative stability during both periods. The share obtaining for crop production activity was 84 per cent and livestock 11 per cent in respect of female employment.

It is evident that there is excessive dependence of rural workers on field crop production sector. The employment in field crop production in Tamil Nadu accounted for as high as 89.84 per cent and 89.52 per cent at All India. Although the excessive dependence on field crop production sector continued till the end of the nineties considerable restructuring of agriculture employment overtook in a number of States induced partly by shifts in domestic demand and partly by the opportunities thrown upon by the open economic regime. For example, in Kerala there was a shift in employment from plantations to field crops production. This could be the consequence of rubber plantations going into deep trouble and consequent retrenchment of workers. Karnataka's post reform strategy seems to have favoured new crops like fruits, vegetables, flowers etc. Against this, in the non-crop sector, the proportion of employment was in the reverse direction.

The growth of employment in agriculture oscillated over from being positive in 1983-94 to negative during 1993-00 in Tamil Nadu. The growth rates of employment (crop sector) in respect of field crop production for two sub-periods: 1983/1993-94 and 1993-94/1999-2000 was from 0.57 per cent to (-) 1.30 per cent in Tamil Nadu, 2.35 per cent to 0.54 per cent in Andhra Pradesh against (-)3.25 per cent to 15.85 per cent in Kerala. Employment growth in non-crop segments (plantations, livestock and fishing) has shown fluctuation. The rate of growth of employment of rural workers in the plantation sub-sector witnessed a decline from 5.68 per cent in 1983-94 to (-)1.02 per cent during 1993-00 in Tamil Nadu.

The labour-absorptive capacity of agriculture as a whole is under stress due to declining land man ratio, increasing marginalisation of holdings, labour-saving cropping pattern of adjustments, increasing mechanisation of field crop operations, increasing treat to domestic agriculture through open door trade policy etc. need to be reiterated in particular. The employment in the non-farm sectors in majority of the States have witnessed varying degree of improvements in transport, storage - communications, construction and manufacturing (agro-based). However, the pace of rural non-farm employment expansion has failed to compensate the sluggish labour absorptive capacity of agriculture. Thus, the all-round setback in the non-farm sector is a matter of worry as it provides a major share of employment in rural economy. An accelerated pace of agricultural growth is the surest way of augmenting the pace of agricultural employment expansion.