

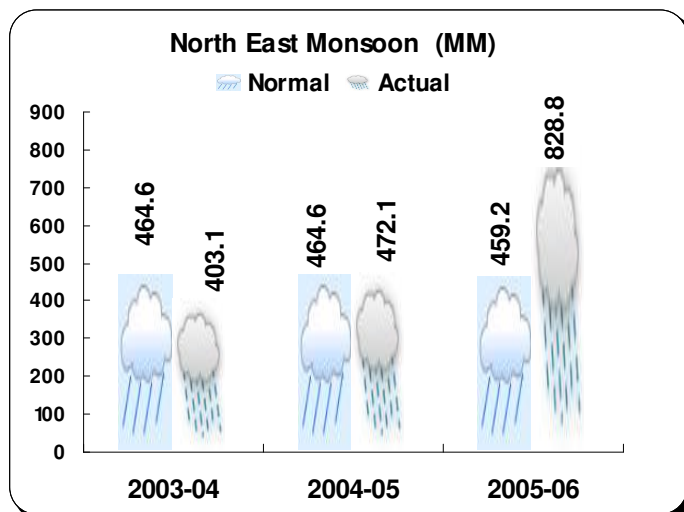
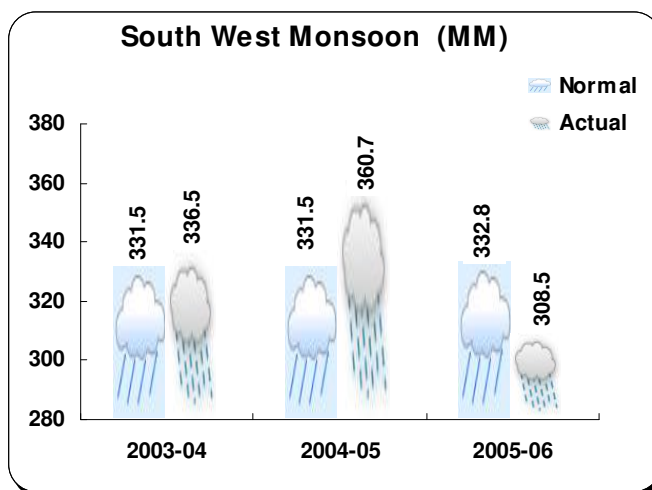
4. AGRICULTURE

Agriculture is the backbone of the State economy since it provides livelihood support to 56 per cent of the population. The State accounts 7 per cent of the country's population and 4 per cent of water resources of the country. About 56 per cent of the total cropped area of the State is under irrigated condition while around 44 per cent of the area is under dry land farming. The contribution of Agriculture to State income was around 13 percent in 2005-06. It supplies raw-materials to agro-based industries besides providing employment opportunities to the rural population. The State aims at increasing production and productivity of both food and non-food crops and also focuses on the development of wastelands. Following the drought situation experienced in the previous years, the agricultural sector in the State experienced a revival in production during 2004-05 and 2005-06 due to timely precipitation.

Rainfall:

The agricultural production and productivity of crops mainly depend on the timely onset of South West and North East monsoons and the quantum and spread of rainfall. The State, especially the coastal regions get relatively higher quantum of rainfall during the North East monsoon. The Mettur dam was thrown open for irrigation on 12th August 2004. This paved the way

for raising samba crop in the delta districts viz. Thanjavur, Thiruvarur and Nagapattinam. Following the two consecutive years of drought, there was a revival in rainfall during 2003-04 which improvement continued in 2004-05 also. The total rainfall received from South-West monsoon during 2004-05 was 8.8 per cent above the normal rainfall. However, during 2005-06 it was 7.3 per cent less than normal. The rainfall received



from South West monsoon was excess in one district, normal in 23 districts and deficient in six districts during 2005-06. The precipitation in the North East Monsoon was comparatively improved from 472.1 (mm) in 2004-05 to 828.8 (mm) in 2005-06. The State has experienced an improvement in the overall rainfall to the tune of 36.1 per cent against the normal level during the review year.

The temporal spread of rainfall is presented in the table below:

Table - 1: Temporal Spread of Rainfall (in mm)

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	360.7 (8.8)	464.6	472.1 (1.6)	961.9	1078.8 (12.2)
2005-06	332.9	308.5 (-) 7.3	459.2	828.8 (80.6)	958.5	1304.1 (36.1)

Note: Figures in bracket indicates .percentage deviation from normal rainfall.

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

When compared to the previous years, the storage level of major reservoirs in the State as on 31.1.2006 was high and comfortable. While Sathanur reservoir reached its FRL, the reservoirs at Papanasam, Krishnagiri and Manimuthar had a storage of above 90 per cent of their capacity and the Storage level at Mettur, Bhavanisagar, Amaravathy, Vaigai, was more than 80 percent. Among the remaining three, Pechiparai reservoir has reached about 73 per cent of its capacity, and the storage level in Periyar and Perunchani reservoirs was only around 45 per cent of their FRL. The details on the water level of major reservoirs are given in the table below.

Table – 2 : Water Level of Important Reservoirs in Tamil Nadu

(In million cu. ft.)

Reservoir	Capacity at FRL	Storage as on 31.1.04	%	Storage as on 31.1.05	%	Storage as on 31.1.06	%
Mettur	93470	7802	8.35	21292	22.78	82027	87.76
Bhavanisagar	32800	1264	3.85	13781	42.02	28799	87.80
Periyar	10570	1038	9.82	1247	11.80	4814	45.54
Sathanur	7321	1373	18.75	4848	66.22	7321	100.00
Vaigai	6091	610	10.01	422	6.93	5040	82.75
Manimuthar	5511	2311	41.93	4622	83.87	5337	96.84
Papanasam	5500	1369	24.89	3662	66.58	5151	93.65
Pechiparai	4450	199	4.47	1214	27.28	3246	72.94
Amaravathi	4047	446	11.02	1023	25.28	3460	85.50
Perunchani	2890	108	3.74	220	7.61	1295	44.81
Krishnagiri	1666	464	27.85	1147	68.85	1607	96.46

Source: Public Works Department, Chennai-600 005

Land Use Pattern:

Land use pattern in the State has witnessed significant changes over the years. The net area sown which stood at 62.59 lakh ha. and accounted for about 48 percent of the total geographical area during Triennium Ending (T.E.) 1979-80 declined to 42.8

per cent in TE 1999-2000 and further to 38.5 per cent in TE 2005-06. The decline in the net area sown may be attributed to the increase in other fallow lands and conversion of agricultural land into non-agricultural purposes including housing sites. The proportion of land put to non-agricultural uses rose from 12.9 per cent to 16.3 per cent during the reference period. The share of forest area in the total geographical area had increased from 15.6 per cent in TE 1979-80 to 16.5 per cent in TE 1999-2000 and marginally declined to 16.3 per cent in TE 2005-06. The share of current fallows had declined from 7.8 per cent in TE 1999-00 to 6.2 per cent in TE 2005-06. The extent of current fallows was found to be the highest in Erode district (90697 ha.) followed by Villupuram (86725 ha.), Coimbatore (84525 ha), Thiruvannamalai (68662 ha.,) and Vellore (55061 ha) in the State. These districts put together accounted for 50.8 per cent of the total current fallows in the State. The proportion of permanent pastures and other grazing lands in the total area had declined from 1.3 per cent to 0.9 per cent during TE 1999-2000 remained at the same level during TE 2005-06. The extent under this category was the highest in Kancheepuram district with 18328 ha., (16.6%) followed by Karur with 10801 (9.8%) in the State. The trend in land use pattern is shown below:

Table - 3: Land Use Pattern

(Area in 000 Ha.)

Sl. No.	Classification	Average Area T.E. 1979 - 80	%	Average Area T.E. 1999-00	%	Average Area T.E. 2005-06	%
1	Forests	2025	15.58	2138	16.45	2118	16.27
2	Barren and Unculturable land	610	4.69	478	3.68	507	3.89
3	Land put to non-agricultural uses	1682	12.94	1966	15.13	2126	16.33
4	Culturable Waste	351	2.70	347	2.67	374	2.87
5	Permanent Pastures and other grazing lands	165	1.27	123	0.95	112	0.85
6	Land under miscellaneous tree crops and groves not included in the net area sown	195	1.50	238	1.83	282	2.16
7	Current fallows	1257	9.67	1008	7.76	803	6.16
8	Other Fallow Lands	456	3.50	1137	8.75	1695	13.01
9	Net area sown	6259	48.15	5560	42.78	5010	38.46
10	Total geographical area	13001	100.00	12996	100.00	13015	100.00

Note: T.E. – Triennium ending.

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

The increase in other fallow lands was due to conversion of cultivable land to other purposes to meet the requirement of urbanisation and inadequate water availability for cultivation arising out of failure of monsoon rain, uncertainty in release of water in Cauvery from major reservoirs and depletion of ground water.

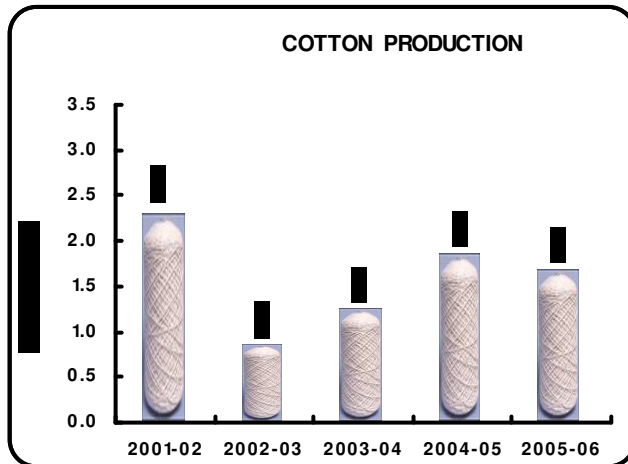
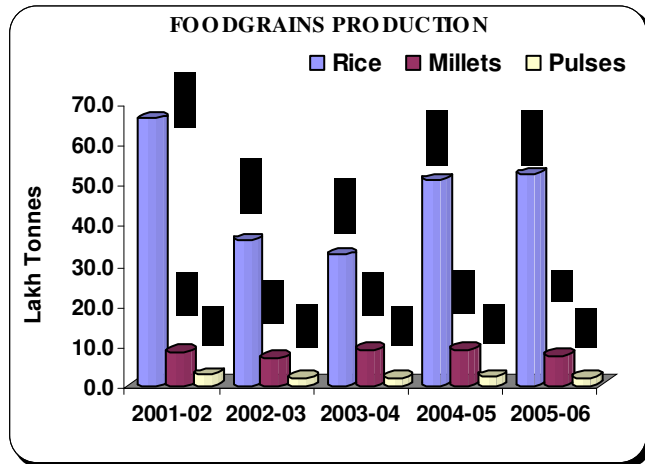
Distribution of Farmers by Size of Holding:

The land distribution is skewed in Tamil Nadu against the small farmers. As a result, marginal and small farmers tend to subsist on low income levels. The results of the successive agricultural censuses confirm the growing imbalance and asymmetry in the distribution of land holdings. As per the results of 1995-96 census, marginal farmers accounting for 74.3 per cent of the total holdings operated only about 30 per cent of the total area while the semi-medium, medium and large farmers accounting for a small proportion of 10 percent of the holding operated a higher proportion of 46.1 per cent of the total area. The number of marginal farmers has been increasing over the years which shows that the process of marginalisation of farmers is continuing.

Area, Production and Yield:

The principal crops raised in the State comprises food crops like paddy, millets, pulses and oilseeds and non-food crops like cotton and sugarcane. The total cropped area and gross production of principal crops depend on the quantum and spread of precipitation and availability of ground water. Paddy, a staple food crop, is grown extensively in the districts of

Thanjavur, Thiruvavur and Nagapattinam. The area under paddy increased from 13.97 lakh ha in 2003-04 to 18.73 lakh ha. (34.1%) in 2004-05 and further to 20.50 lakh ha.(9.5%) during 2005-06. The yield rate of paddy also rose by 17.1 per cent to reach 2703 Kgs/ha in 2004-05 and 2541 kgs/ha. in 2005-06. In harmony with this, the paddy production rose from 32.23 lakh tonnes in 2003-04 to 50.62 lakh tonnes in 2004-05 and to 52.09 lakh tonnes in 2005-06.



However, the production of millets in the State which marginally declined by 2.3 per cent from 8.9 lakh tonnes in 2003-04 to 8.68 lakh tonnes during 2004-05 sharply deduced to 6.30 lakh tonnes in 2005-06 due to reduction in area under the crops by about 8.7 per cent in 2004-05 and 10.1 per cent in 2005-06. On the other hand, the production of pulses had increased by 7.5 per cent from 2.01 lakh tonnes to 2.16 lakh tonnes and declined to 1.77 lakh tonnes in the respective years. The total area under food grains had increased from 32.87 lakh ha., in 2004-05 to 33.17 lakh ha., in 2005-06 and the overall yield rate of food grains was at 1870 kgs, / ha., and 1844 kgs. / ha, and the total production of food grains was at 61.46 lakh tonnes to 61.16 lakh tonnes during 2004-05 and 2005-06.respectively.

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

Crops	Area (Lakh ha.)			Production (Lakh tonnes)			Yield Rate (Kgs. / ha.)		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
Paddy	13.97	18.73	20.50	32.23	50.62	52.09	2308	2703	2541
Millets	9.03	8.24	7.41	8.88	8.68	6.30	983	1053	850
Pulses	5.37	5.90	5.25	2.01	2.16	1.77	375	367	337
Food grains	28.37	32.87	33.17	43.12	61.46	61.16	1520	1870	1844
Oilseeds*	6.95	7.15	7.09	9.64	10.61	11.52	1387	1484	1527
Cotton@	0.98	1.29	1.10	1.23	1.86	1.68	213	244	260
Sugarcane\$	1.92	2.22	1.92	17.66	24.46	32.44	102	110	105

- - includes groundnut, gingelly, castor and sunflower @ - in lakh bales of 170 kgs. of lint each; \$ - in terms of gur. Sugarcane Yieldrate – Tonnes per .ha.

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

Index of Agricultural Production:

Index of agricultural production is the summary measure of the performance of agricultural sector in a year under review. The Index Numbers of area, production and productivity of food and non- food crops for a period of three years are furnished below:

Table - 5 :Index Number of Area, Production and Yield Rate of Principal Crops
(Base: Triennium ending 1993-94=100)

Crops	Area	Production	Yield Rate
Food Crops			
2003-04	76.06 (0.69)	67.93 ((-) 7.9)	83.34 (-) (1.79)
2004-05	87.37 (11.31)	96.72 (28.79)	98.06 (14.72)
2005-06	91.61 (4.24)	108.91 (12.19)	97.55 (-) 0.51
Non-Food Crops			
2003-04	66.27 (6.77)	66.66 (-) 1.51	70.50 (-) 6.37
2004-05	69.17 (2.9)	87.75 (21.09)	90.88 (20.38)
2005-06	68.54(-) 0.63	99.81 (12.06)	101.48 (10.60)
Overall			
2003-04	75.22 (4.54)	67.65 (-) 5.90	80.20 (-) 3.14
2004-05	83.32 (8.10)	94.45 (26.80)	96.27 (16.07)
2005-06	85.36 (2.04)	106.61 (12.16)	98.46 (2.19)

Figures in brackets indicates the change over the previous year in points .

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

The following are the inferences made from the above table.

- The Index of Agricultural production during 2004-05 has gone up by 12.16 points over the previous year due to 2.19 points increase in productivity per hectare and 2.04 points increase in area under crops.
- The increase in the production of Food Crops (12.19 points) was marginally higher when compared to that of Non-Food Crops (12.06 points)
- While the increase in production of food crops was due to the increase in area under crops (4.24 points), the increase in the production of non-food crops was due to increase in productivity (10.60 points).

Tenth Plan Mid-Term Appraisal:

The overall growth rate in the economy during the Tenth Plan Period was targeted as 8 per cent to which the contribution from agriculture and allied activities was expected to be of the order of 4 per cent. Various strategies had been planned to achieve this goal. The physical targets in terms of area, production and productivity of select crops and the achievement during the first four years of the Tenth Plan Period, are furnished below. The agricultural sector had experienced severe set back during the first two years of the Tenth plan period due to drought conditions. The revival that took place during 2004-05 continued in 2005-06 also. Even if the Agricultural performance during 2006-07 turns out to be very good, the overall Tenth Plan target is unlikely to be realised.

Table -6 Target and Achievement during X Plan Period

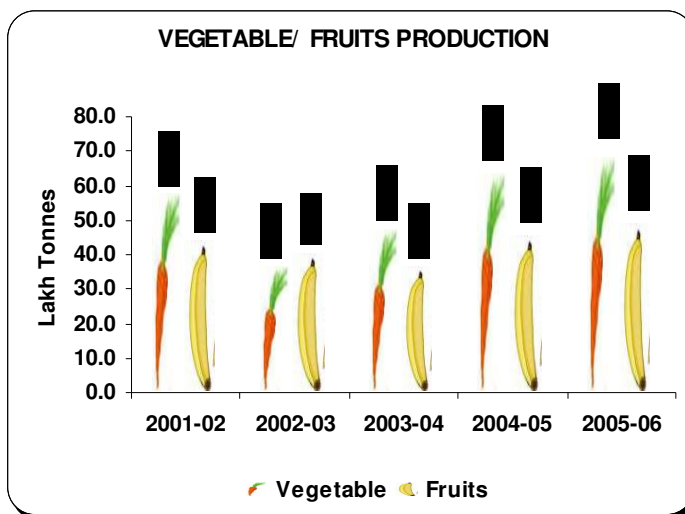
Crop	Area (Lakh ha)		Production (Lakh tonnes)		Productivity (kg. / ha.)	
	T	A	T	A	T	A
Paddy	22.00	17.34	91.04	42.68	4138	2478
Millet	11.00	7.70	11.84	7.93	1076	990
Pulses	8.00	5.54	3.50	1.99	438	359
Total Food Grains	41.00	30.58	106.38	52.59	2595	1708
Cotton	2.50	1.03	8.60	1.40	585	226
Sugarcane	3.00	2.56	40.59	24.68	13530	10365
Oilseeds	10.50	6.78	18.08	9.84	1722	1445

Note: Achievement figures indicate an average of first four years of the X Plan.

T- Target; A - Achievement

Horticulture:

The State is endowed with agro-climatic conditions conducive for growing a wide range of horticulture crops such as fruits, vegetables, spices, plantation crops, flowers, medicinal and aromatic plants. Tamil Nadu shares 8.7 per cent of the production of these crops and 5.3 per cent of the area at All India level. The State aimed at producing horticulture crops at a faster pace to achieve an annual growth of 8 per cent in this sector during the X Plan and to ensure doubling the production at the end of the XI Five Year Plan. The Horticulture crops are income elastic and provides raw materials to agro-based industries besides providing avenues for employment and income generation to the rural population.



Performance of Horticulture during 2005-06:

The area under major horticulture crop groups and their yield rates were expected to increase marginally by 4.8 per cent and 0.20 per cent respectively during 2005-06.

However, the total production of horticulture crops was expected to improve from 126.20 lakh tonnes in 2004-05 to 135.68 lakh tonnes in 2005-06.

The production of vegetables was expected to register an increase of 7.8 per cent from 63.08 lakh tonnes in 2004-05 to 68.00 lakh tonnes in 2005-06 that of fruits by 8.0 per cent, Spices and condiments 7.8 per cent and Flowers 8.0 per cent. The production of plantation crops was expected to increase marginally by 2.7 per cent. The production of medicinal plants was expected to increase by 37.5 per cent from 0.09 lakh tonnes to 0.11 Lakh tonnes. The details are furnished below.

**Table – 7 : Area, Production and Productivity of Horticulture Crops –
By Crop Groups**

	Crop Groups	2004-05			2005-06(P)		
		A	P	Y	A	P	Y
a.	Fruits	2.36	44.98	19.07	2.55	48.56	19.07
b.	Vegetables	2.15	63.08	29.29	2.32	68.00	29.30
c.	Spices and Condiments	1.43	8.05	5.62	1.54	8.68	5.64
d.	Plantation crops	2.57	8.13	3.43	2.49	8.30	3.23
e.	Flowers	0.23	1.87	8.06	0.25	2.02	8.11
f.	Medicinal plants	0.05	0.09	1.82	0.06	0.11	2.00
	Total	8.79	126.20	14.70	9.21	135.68	14.73

(P) - Provisional Area – Lakh.ha, Production –Lakh tonnes, Yield –Tonnes/ha

Source: Commissioner, Department of Horticulture and Plantation crops, Chennai –5.

Tamil Nadu Horticulture Development Mission (X Plan):

Tamil Nadu is the first State in India to start a separate mission for the development of Horticulture. It mainly focussed on doubling the horticulture production in the State. To promote high density planting of mango and cashew cultivation, a sum of Rs.16.12 lakhs was sanctioned in the State. The area under horticultural crops like fruits, vegetables, spices and condiments, plantation crops and flowers had witnessed a declining trend in 2002-03 and 2003-04 mainly due to the drought situation that prevailed in the State during these years. Due to consecutive drought conditions considerable reduction was noticed in the area and the production of horticulture crops like tapioca, turmeric, banana, chillies and onion. However, this trend has been arrested and a revival took place in 2004-05 with good area coverage, production and productivity and a further boost is anticipated in 2005-06 in the State. The Tenth plan targets and achievements during the first four years for the major horticulture crop groups are furnished below.

Table –8 : Horticulture : Target and Achievement during X Plan Period

Crop	Area (Lakh ha)		Production (Lakh Metric tones)		Productivity (kg. / ha.)	
	T	A	T	A	T	A
Fruits	2.27	2.43	62.40	43.88	27.48	18.06
Vegetables	1.83	2.08	58.52	54.96	31.97	26.42
Spices & Condiments	1.76	1.57	4.41	7.86	2.50	5.01
Plantation Crops	1.86	2.46	8.37	8.44	4.50	3.43
Flowers	0.20	0.22	1.54	1.81	7.7	8.22

Note: Achievement is first four years average of X Five Year Plan Period

T- Target; A - Achievement

In the case of vegetables, though a good coverage in area was noticed, the production and productivity targets were not achieved. In respect of spices and condiments, a reverse trend has been noticed, the area fell short of the target, whereas production and productivity were well above the targeted figures. In the case of plantation crops the target in respect of area and production were realised while there was a gap in productivity. The targets in respect of area, production and productivity of flowers were achieved.

Precision Farming:

In order to promote innovative water optimising farming practices precision farming is being piloted in the State. *“Precision farming is a Hi-tech approach which consolidates available technologies relating to soil, water, inputs and varieties and integrates them in an appropriate order so as to translate them in real situations and to enhance the productivity upto the genetic potential of the crop”*.

This Project is being implemented in the districts of Dharmapuri and Krishnagiri to cover 400 hectares of farmers’ holdings at an outlay of Rs.720.60 lakhs over a period of three years. The high value crops like gherkins, hybrid tomato, capsicum, chillies, baby corn, white onion, bhendi, cabbage and cauliflower are being cultivated under precision farming techniques. The beneficiaries covered under the project during the first, second and third year are provided with a subsidy of 100 per cent, 90 per cent and 80 per cent respectively on the cost of drip and fertigation units and inputs for the first crop under PF. Under this farming, an area of 100 ha. was covered during 2004-05 and 200 ha. in 2005-06. It is proposed to extend this Project to the districts of Vellore, Erode, Madurai, Theni, Trinelveli, Kancheepuram and Tiruvallore and to cover fruits and flowers besides vegetables.

Sericulture:

The State has a long tradition of producing silk fabrics. The silk sarees of Kancheepuram, Arni, Kumbakonam and Rasipuram have carved a niche in the world of fabrics. The agro-based sericulture industry provides regular employment and income to the farmers. Mulberry cultivation in the State have dwindled from 27,650 acres in 2000-01 to 10,060 acres in 2003-04 mainly due to adverse seasonal conditions. However, the area under mulberry has increased to 12683 acres in 2004-05 and further to 16,535 acres in 2005-06. It was estimated that 17,350 farmers would be engaged in these activities in 2005-06. It is proposed to bring an additional area of 3100 acres under mulberry cultivation during 2006-07 in the State. The production of cocoon in the State has increased from 3101.20 metric tonnes in 2004-05 to 5224.90 metric tonnes in 2005-06 and the production of raw silk has increased from 4430 metric tonnes to 738.8 metric tonnes during the above period.

Agricultural Marketing:

The entire thrust and efficiency of Agriculture sector is dependant on marketing support so that the farmers’ risk is minimised, besides getting an assured and fair return. An efficient marketing system holds the key to the success of diversification of agricultural production. Scientific methods of price discovery and intermediation is dependent on timely availability of information. Market intelligence has a vital role to

play. The TNAU has a market intelligence unit which provides vital information to farmers for marketing.

At present 21 market committees are functioning in Tamil Nadu at the district level. Under these market committees, 273 regulated markets, 15 check posts, 108 rural godowns and 108 grading centres are functioning in the State.

Among the 273 regulated markets 93 markets have been provided with computer inter net facilities for effective price dissemination among farmers through web site under Agmark net Scheme. Under Agricultural marketing 42 agricultural commodities viz., cereals, pulses, oil seeds, cotton, turmeric etc., were notified. As part of grading operations, 108 Grading Centres consisting of 96 commercial grading centres, 11 kapas grading centres and one tobacco grading centre are functioning in the regulated markets. The Grading Centres are now renamed as Post Harvest Technology Information Centres. The farmers are being trained in these centres to motivate them to adopt the post harvest technology in the State. The total value of agricultural produce transacted through agricultural marketing co-operatives had improved and more than doubled from Rs. 307.25 crores in 2004-05 to Rs. 674.2 crores in 2005-06.

Table – 9 : Value of Agricultural Produce Sold by Marketing Cooperatives
(Rs. crores)

Sl. No.	Crop	2003-04	2004-05	2005-06
1.	Foodgrains	38.73	35.97	32.60
2.	Cotton	90.43	94.59	69.81
3.	Chillies	2.81	2.80	2.18
4.	Coffee	-	-	-
5.	Sugarcane	92.72	79.74	466.72
6.	Species	0.11	44.84	28.79
7.	Oilseeds	16.09	13.05	18.07
8.	Others*	99.99	36.24	56.08
	Total	340.88	307.25	674.26

* Included potato, vegetables and rubber. Source: The Registrar of Cooperatives, Chennai - 10.

Contract Farming¹ :

Contract farming has the potential for risk mitigation and stable marketing arrangements. In order to meet the demand for cotton and to link and protect the interests of farmers and the industry with assured marketing, Contract Farming is being promoted in the State. Under Contract farming on cotton, the farmers are provided support on marketing, input, technical assistance, credit, production management, insurance coverage etc. This strategy has been introduced by private firms. Contract farming is gradually spreading. This insulates the farmers from risks besides assuring marketing support and assured returns. In all, 9271 acres were covered under contract farming on cotton particularly the finer varieties in the districts of Thiruvarur, Thanjavur, Nagapattinam, Ramnad, Coimbatore, Namakkal, Salem, Theni and Madurai during 2004-05. Further, Contract farming on less water intensive crops like maize, pulses and oilseeds was implemented in the State and 4015 MTs of maize has been procured in Thoothukudi during 2005-06.

Input Management:

Crop production depends on various factors such as soil fertility, assured irrigation, ideal agro-climatic conditions, optimum use of inputs like seed, fertiliser and PP chemicals, adoption of IPM, credit management etc. In order to increase production

¹ Contract Farming' is defined as a system for the production and supply of agricultural/horticultural produce under forward contracts between producers/suppliers and buyers.

and yield rate of agricultural crops, the State is adopting input management practices for both food and non-food crops.

Power:

Power is an indispensable and strategic variable in the process of agricultural development. Free supply of power was made available to marginal farmers in the State since 1984-85 and to small farmers also from 1.8.99. The extension of free supply of power to farmers on a blanket basis entailed a sizeable total subsidy of Rs.1172.9 crores in 2005-06 (RE). Supply of power, particularly the reliability, quality of power is important from the farmer's perspective.

Seed:

Seed is another critical input for enhancing agricultural production and productivity. Seed quality is crucial for attaining sustained growth rate in the production process. The State is committed to ensure production and supply of good quality seeds as per Seed Replacement Rate (SRR) to the farmers in time.

Under the seed multiplication programme, the breeder seeds are supplied from Tamil Nadu Agricultural University (TNAU) and from ICAR, GOI. The foundation seeds produced from Breeder Seeds in 37 State Seed Farms, 5 oil seed farms and one pulses farm are then multiplied as certified seeds in the farmers holdings. The foundation and certified seeds are processed in 74 seed processing units comprising 16 major, 3 medium and 55 mini units functioning in the State.

The total quantity of Certified Seeds produced in the State through these farms and Agencies at 48269 M.T. in 2004-05 and 56074 M.T. in 2005-06 had surpassed the targets set for the years by 3.8 per cent and 15.6 per cent respectively.

Seed Replacement Rate:

The State Seed Multiplication Programme is based on the Seed Replacement rate envisaged for the various crops by the Agriculture Department. The seed replacement rate determined for different crops are indicated below:

Table – 10 : Seed Replacement Rate of Select Crops : 2005-06

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

Source: Narrative notes on Plan Programme-2005-06, S.P.C., Chennai.

Chemical Fertilisers:

The balanced application of fertilisers like Nitrogen, Phosphorus and Potassium (NPK) which has a positive correlation with yield rate plays a crucial role in the production process and productivity of agricultural crops. The State has taken steps for advocating application of fertilisers as per crop requirement and in a balanced manner in the ratio of 4:2:1 after soil test for avoiding indiscriminate use of nitrogenous fertilisers. With a view to enabling the farmer to decide on the dose of nitrogenous fertilisers to be applied on the basis of the need of the crops, the technology to compare the paddy crop with the colour chart is being promoted and 2.15 lakh number of colour charts were distributed at a cost of Rs.49 lakhs during 2005-06. It was proposed to distribute 2.25 lakh numbers of colour charts free of cost to the farmers in the State during 2006-07. The actual fertiliser consumption (NPK) had gone up from 9.52 lakh tonnes in 2004-05 to 10.99 lakh tonnes in 2005-06. It was targeted to distribute 12.97 lakh tonnes of fertilisers during 2006-07.

Table – 11 : Distribution of Chemical Fertilisers

Nutrients	(lakh tonnes)		
	2004-05	2005-06	2006-07 Target
Nitrogen (N)	4.83	5.59	5.56
Phosphates (P)	2.11	2.56	3.01
Potash (K)	2.58	2.84	3.40
Total	9.52	10.99	12.97

Source: Policy Note Agriculture, 2006-07.

Bio-Fertiliser:

The use of Bio-fertilisers is a vital component in the Integrated Nutrient Management of crops. Application of bio-fertiliser is eco-friendly and cost effective. The use of Bio-fertilisers is gaining momentum in the State due to the efforts taken to demonstrate the ill effects of indiscriminate use of chemical fertilisers and the spiraling price of fertilisers. The distribution of bio-fertilisers in the State rose from 1263 MTs in 2004-05 to 1475 MTs in 2005-06.

Plant Protection:

The incidence of pest and disease in crops is being monitored through systematic pest surveillance in the State. Tamil Nadu is the pioneer in implementing the Integrated Pest Management Programme (IPM) through farmers Field School Approach. The farmers are being trained to identify and monitor the level of pest and natural enemies in the field and resort to the use of chemical pesticides only as a last resort when the pest population exceeds the economic threshold level. The adoption of IPM and reduced use of pesticides help to contain the cost of cultivation and also to obviate the ill effects like environmental pollution, residual toxicity, resurgence of pests etc. The Integrated Pest Management concept is being popularised through centrally sponsored schemes relating to rice, cotton, pulses, maize, oil seeds etc. During 2005-06, an area of 29.29 lakh ha. in food crops, 13.34 lakh ha., under non-food crops have been covered under pest treatment. An area of 3.06 lakh ha. and 4.36 lakh ha were covered under rat control and weed control respectively. An area of 18.93 lakh ha., has been covered under seed treatment in the State. The plant protection activities would be carried out to cover 38 lakh ha., under food crops and 19 lakh ha., under non-food crops and 23 lakh ha., under Seed treatment during 2006-07. Under the plant protection scheme, an amount of Rs.113.73 lakhs have been spent during 2005-06 for procurement and distribution of bio-control agents and bio-pesticides.

Agriculture Credit:

The role of co-operatives is very important in providing short term and medium term loans to the farming community. The short term credit flow in the State for the cultivation purpose had gone up by 4.8 per cent from Rs.1080.58 crores in 2004-05 to Rs.1132.18 crores in 2005-06. It is programmed to provide Rs.1235 crores as short term loan during 2006-07. The medium term loan issued for subsidiary occupation was only to the tune of Rs.37.76 crores in 2005-06 in the State. The details of short term and medium term farm sector loans issued are given below:

Table – 12 : Flow of Agriculture Credit

Year	(Rs. crores)	
	Short-term Loan	Medium term loan
2003-04	616.59	72.15
2004-05	1080.58	50.19
2005-06	1132.18	37.76

P- Programme Source: Policy Note – Co-operation Department

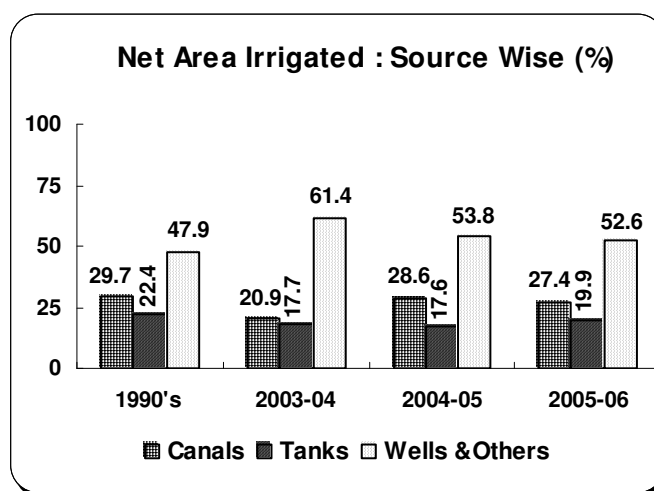
Waiver of Co-operative Agriculture Loans:

Due to drought situation that prevailed at the end of IX Five Year Plan (2001-02) and in the beginning of the X Five Year Plan (2002-03 to 2003-04), and the resultant failure of crops, the farmers were unable to repay the co-operative loans availed by them. In view of huge amount of outstanding loans the primary co-operatives at the village level could not get the required funds for providing short term cultivation loans from the District Level Central Co-operative Banks. Hence, with a view to relieving the farmers from debt burden, the State has waived the loans issued to farming community through the co-operatives as on 31.3.2006. Under this initiative the loans with outstanding interest of loanees have been waived. The loan discharge certificates have been issued in respect of 22,19,093 loan accounts to the tune of Rs.5415.82 crores in the State.

Irrigation:

The major irrigation sources in the State are canals, tanks and wells. The per capita availability of water in the state stood at 900 cubic metres as against the All-India level of 2200 cubic metres. Well irrigation is predominant in the State since it accounts for 53 per cent of the total irrigated area during 2005-06 followed by canals (27.4%), tanks (19.9%).

The Net Area Irrigated and Gross Area Irrigated had improved by 35.8 per cent and 37.1 per cent respectively during 2005-06 over 2003-04. The area under canal, tank and well irrigation had witnessed an improvement of 77.8 per cent, 52.6 per cent and 18.5 per cent respectively between 2003-04 and 2005-06 while the cropping intensity had gone up from 113.4 per cent in 2003-04 to 115.1 per cent in 2005-06, the irrigation intensity had improved from 115.3 per cent to 116.4 per cent. The relatively improved position on the irrigation front



during 2005-06 which was enabled by good precipitation has led to an increase in foodgrains production from 43.1 lakh tonnes in 2003-04 to 61.2 lakh tonnes during 2005-06. The details are given below.

Table - 13: Irrigation Profile - Tamil Nadu

Item	2003-04	2004-05	2005-06
Total rainfall (in mm.)	1034.6	1078.8	1304.1
Net area irrigated (lakh ha.)	21.5	26.4	29.2
Canals	4.5	7.5	8.0
Tanks	3.8	4.7	5.8
Wells (tube and ordinary wells)	13.0	14.0	15.4
Others	0.2	0.2	Neg
Gross area irrigated (lakh ha.)	24.8	30.9	34.0
Net area sown (lakh ha.)	46.9	51.0	52.4
Gross cropped area (lakh ha.)	53.2	58.9	60.3
Irrigation intensity (%)	115.3	117.0	116.4
Cropping intensity (%)	113.4	115.5	115.1
Net area irrigated as percentage to net area sown	45.8	51.8	55.7
Gross area irrigated as a % to gross cropped area	46.6	52.5	56.4
Total foodgrains production (lakh tonnes)	43.1	61.5	61.2

Source: Season and Crop Report - 2005-06, Directorate of Economics and Statistics, Chennai-6.

Command Area Development Programme:

Farmers' participation in water management activities is necessary for ensuring optimum utilisation of available quantity of water and for covering maximum area. The Centrally Sponsored Command Area Development Programme (CADP) aims at improving water use efficiency in canal irrigated areas 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 thirteen commands during 2004-05 and 2005-06 in the State. In the thirteen command areas, On Farm Development Works (OFD) were carried out at a total cost of Rs.37.12 crores during 2004-05 and Rs.39.89 crores during 2005-06. However, only an area of 19792 ha., has been benefited during 2005-06 as against 25897 ha., during 2004-05. The total expenditure on Rotational Water Supply (RWS) declined from Rs.1.42 crores in 2004-05 to Rs. 0.75 crores in 2005-06. The area benefited has also got reduced correspondingly from 53317 ha. to 25550 ha., during the respective years. Cauvery, Parambikulam Aliyar, Tambiraparani and Manimuthar Commands together accounted for more than 60 per cent of the total area benefited under both OFD and RWS works during 2005-06.

Table - 14 : Command Area Development Programme

Commands	On Farm Development Works				Rotational Water Supply			
	Expenditure (Rs. lakhs)		Area benefited (Hectares)		Expenditure (Rs. lakhs)		Area benefited (Hectares)	
	2004-05	2005-06	2004-05	2005-06	2004-05	2005-06	2004-05	2005-06
Cauvery	1862.58	1771.16	13973	4623	108.68	30.08	41630	10456
Parambikulam Aliyar	806.74	462.88	4585	1732	13.48	5.15	4683	1743
Tambiraparani	520.08	485.76	3607	3401	9.36	8.65	3250	2949
Thoppaiyar	3.54	-	-	-	-	-	-	-
Krishnagiri	122.63	12.62	377	-	2.27	-	816	-
Palar porandalar	207.08	173.81	1516	967	4.50	2.85	1543	967
Gadana Ramanadhi	41.55	172.59	405	1506	1.20	4.50	405	1506
Nambiyar	38.45	175.07	401	1505	1.19	4.47	401	1505
Pachaiyar	17.79	172.95	190	1525	0.45	4.45	190	1512
Manimuthar	54.40	277.31	517	2268	1.17	6.74	399	2325
Anaimaduvu	13.91	97.22	102	758	-	2.55	-	860
Chinnar	10.63	92.91	100	750	-	2.55	-	850
Maruthanadhi	13.02	94.33	124	757	-	2.61	-	877
Total	3712.39	3988.61	25897	19792	142.29	74.59	53317	25550

Note: Technical Cell for 2004-05 and 2005-06 excluded. Source: Agricultural Engineering Department, Chennai - 35

The Water Resources Consolidation Project implemented in the State with World Bank assistance came to a close by 2004. To improve the overall efficiency and storage capacity of the State's meagre water resources, a follow-on project namely IAMWARM Project (Irrigated Agriculture Modernisation and Water Resources Management) is contemplated for implementation with World Bank assistance at an estimated cost of about Rs.3900 crores. This project which will be planned and executed on an Integrated Approach like the Pilot Project executed in Hanumanathi sub-basin of Thamiraparani Basin in Tirunelveli district aims at achieving higher productivity of water, increasing the efficiency of use of water, diversification of agriculture, increasing farm income through Aquaculture and Animal Husbandry and ensuring better prices for agricultural produce with better marketing strategy and information technology intervention. The Project has two components viz. (i) Irrigated Agriculture Modernisation and (ii) Water Resources Management. A preliminary project covering 42 out of 127 sub-basins was prepared and sent to World Bank. The World Bank has suggested preparation of detailed project report as a pilot project for 10 sub-basins at the first instance so as to launch the implementation of the project from 2007-08. The project would be implemented through line departments monitored by the Project Director, Multi Disciplinary Project unit, IAMWARM.

Micro Irrigation:

Micro irrigation consists of Drip Irrigation and Sprinkler Irrigation. Under the centrally shared scheme for providing micro irrigation wherein the scheme cost is shared between the Centre and State in the ratio of 90:10, drip irrigation system was provided during 2004-05 to cover an extent of 6935 ha., at a cost of Rs.304.30 lakhs. Similarly, sprinkler irrigation system covering an extent of 2890 ha, was provided at a cost of Rs.154.80 lakhs.

Flow of Credit to Minor Irrigation:

Tamil Nadu which accounts for 7 per cent of population of the country is endowed with only 3 per cent of water resources in India. The water potential of the State inclusive of Ground Water stood at 46,540 mcm (1643 TMC). The surface water potential of the State is of the order of 24,160 mcm (853 TMC) which includes the contribution of 7391

mcm or 261 TMC from the neighbouring States like Kerala, Karnataka and Andhra Pradesh. In the context of failure of monsoon and non-dependability of flow irrigation it becomes necessary to improve the ground water sources for further development.

Ground Water Potential:

Table – 15 : Ground Water Potential

The ground water potential available for future development has been estimated at 3142.27 M.cum. as of January 2003. This balance potential is mostly distributed in 239 blocks comprising safe, semi-critical and critical categories. The distribution of blocks according to category is indicated in table 15 .

Sl. No.	Category	No. of Blocks
1.	Safe Blocks	97
2.	Semi-Critical Blocks	105
3.	Critical Blocks	35
4.	Over-Exploited Blocks	138
5.	Saline Block	8
	Total	385

Source: Policy Note on Building and Irrigation 2006-07.

However, for the development of minor irrigation, the scheme works like construction of bed dam and dividing wall; supply channels, formation of new tanks and construction of groynes were carried on with the funds from co-operatives, Central banks, Regional Rural banks and other agencies in the State. The flow of credit through these financial institutions had improved from Rs.9080 lakhs in 2002-03 to Rs.14797 lakhs (63%) in 2003-04 and in 2004-05 slightly dipped down to Rs.14583 lakhs.

Water Harvesting:

The over exploitation of ground water in many areas of the State has resulted in lowering of water table below the economic pumping level. Hence, special methods of Rain Water Harvesting and ground water recharge are warranted to save the well-irrigated areas. Construction of farm ponds, check dams, percolation ponds and rejuvenation of failed / unused / abandoned wells are taken up with an outlay of Rs.10 crores during 2005-06. This programme for Rain Water Harvesting and run off management has been implemented on Watershed basis. Besides, Rain Water Harvesting works such as farm ponds and check dams, abandoned wells have been taken up under all Soil and Water Conservation Programme. In addition, massive, run-offs from floods are potential sources of supply, which can be tapped to augment irrigation.

Renovation and Restoration of Water Bodies:

A pilot project for taking up repairs, renovation and restoration of water bodies in Villupuram and Sivagangai districts has been prepared and sent to Government of India for getting 75 per cent of the cost as grant. The Ministry of Water Resources, Government of India has approved the project for implementation.

Under the National programme on repairs, renovation of water bodies directly linked to agriculture, a project proposal of Rs.2600 crores has been forwarded to GOI, which will provide 25 per cent of the cost as grant and arrange for a loan assistance for 75 per cent through World Bank. This project will confer benefit to 10540 system and non-system tanks maintained by PWD and around 8600 tanks maintained by Rural Development Department.