

Agriculture is the principal source of livelihood for more than 40 percent of the population of this State. Agriculture provides wage goods required by the non-agricultural sectors and raw materials for the industrial sector. Ratcheting up the growth of the economy would be possible provided the agriculture sector fares well on a sustained basis. A good performance of the agriculture sector is viewed as an effective instrument for attainment of inclusive economic growth and poverty reduction. The State achieved an all-time high record production of 10.1 million tonnes of foodgrains during 2011-12 and received the Krishi Karman Award from the Government of India. Tamil Nadu performed well ahead of other major States in terms of productivity of important crops. It ranked second in the productivity of paddy next only to Punjab and came first in the yield of maize and oilseeds. The productivity of sugarcane in Tamil Nadu was almost double of what was obtained at the national level. The better agricultural accomplishments are the result of continued technological gains and appropriate policies and timely intervention measures of the Government.

Vision 2023 – Strategic Initiatives in Agriculture

Tamil Nadu envisages achieving 5.0 percent of annual average growth rate in Agricultural sector. To achieve this, key initiatives to be taken under Vision 2023 are:

- *Promote market driven agricultural produce*
- *Accelerating Innovation and Extension Mechanism*
- *Functional consolidation of land holdings*
- *Emphasis on mechanization*
- *Improving Productivity*
- *Assurance of timely irrigation*
- *Creating a robust supply chain*
- *Skill development in agriculture*

The investment proposed the agriculture sector is Rs.40,000 Crores – Rs.16000 Crore for improving water resources, Rs.13000 Crore for agro-processing and value addition and Rs.11000 Crore for other projects (cold storages, grain storage complexes, perishable air cargo complex, gamma irradiation facility and terminal market complexes.

Source: Vision 2023, Government of Tamil Nadu.

Unfortunately, the strong growth performance of 2011-12 has been interrupted due to the severe drought conditions caused by a large rainfall deficit and the non-release of water in the Cauvery by Karnataka during 2012-13. Growth in the agricultural sector has taken a big dip in 2012-13. The State Government has stepped in with the special relief packages for samba paddy to aid farmers in distress and to ensure an early recovery of agricultural production and productivity.

During the 12th Five Year Plan (2012-17), the State Department of Agriculture's focus will continue to be on stabilizing foodgrain production so as to ensure food and nutrition security. It is planned to achieve the rate of growth of 5.0 percent in agricultural output. Further, it aims to increase the production to 170 lakh tonnes in the case of foodgrains, 5 lakh bales of cotton, 545 lakh tonnes of cane and 17 lakh tonnes of oilseeds. The task is highly challenging. Therefore, the focus is to improve the yield rate per unit of land/ water. Apart

from that, for attaining higher levels of production, considerable importance is accorded to crop-specific strategies. New strategies are being evolved to break yield barriers, to utilize inputs more efficiently and diversify to more sustainable and higher value crops.

In the above backdrop, the performance of the agricultural sector during 2011-12 and 2012-13 is fully reviewed using the data available. For 2013-14, the prospects of the agricultural sector are based on the data available, forecasts and projections made and target set.

4.1. Agriculture Prospects – 2013-14

The overall crop prospects in the State during 2013 – 14 are encouraging. During the current year the onset of the South-West Monsoon was in time. The temporal spread of rainfall during this monsoon was by and large favourable for raising crops. It was 'excess' in June and August and 'normal' in September. The spatial spread indicated that it was 'normal' in 17 districts, 'excess' in 7 districts, 'deficit' in 6 districts and 'scanty' in 2 districts. Thus, the spatial spread benefited 73.0 percent of the total geographical area of the State spread over 24 districts. The total quantum of rainfall received from this season at 325.4 mm was rated

Year	South-West Monsoon	North-East Monsoon	Annual
Normal	321.3	440.4	921.0
2009-10	317.0	482.6	937.8
2010-11	383.6	605.2	1165.1
2011-12	300.5	540.8	937.1
2012-13	245.9	370.5	743.1
2013-14	325.4	294.3	--

Source: Department of Economics and Statistics, Chennai - 6

as 'normal'. The temporal and spatial spread of rainfall during this monsoon was also helpful in recharging the groundwater considerably. Apart from this, the monsoon brought copious inflows into the State's surface flow sources and built up adequate storages. In tune with the requirements of the farmers, the release of water from the main reservoir viz., Mettur dam since 2nd August 2013 was regulated in a systematic manner with adequate quantity. The release of water from other important

reservoirs was also in accordance with the requirements of the farmers.

The irrigation scenario in the State during the current year 2013 – 14 has turned out to be encouraging. This resulted in an increase in the area under irrigated cropping in the State. Besides, the Government made fool-proof arrangements for the timely and adequate supply of all necessary inputs through Agricultural Extension Centres. The Co-operative Societies were geared up to provide adequate crop loans to the eligible farmers. The State Government provided uninterrupted 12 hours three phase power supply to the delta districts and 8 hours for non-delta districts for encouraging the farmers to take up agricultural activities with sub-surface water. All these efforts of the State were aimed to motivate the farmers and to redouble their efforts to take up agricultural activities with more vigour during the current year.

The intervention of North-East Monsoon during the year was in time. However, the rainfall received was in deficit during the entire season. It was (-) 29.6 percent in October 2013, (-) 33.7 percent in November 2013 and (-) 39.3 percent in December 2013. During this monsoon period, as against the normal level of 440.4 mm, the actual rainfall received in the State was 294.3 mm (-33.2%). The spatial spread also was uneven. The uneven distribution of rainfall over time and space during the North-East Monsoon would have some adverse impact on the standing crops and crops grown mainly under rainfed conditions. The carry-over storages in the surface flow sources that came from the South-West Monsoon were utilized. As a result, it is hoped to bring in more area under cultivation, area irrigated and to

reduce current fallows to a considerable extent as compared to the level of 2012-13. All these factors would be conducive for the agricultural sector to recover from the impact of drought witnessed in the previous year 2012-13 during 2013-14. Ultimately, the overall cropping scenario in the State for the year is turning out to be encouraging.

With the favourable interplay of the above factors, the State forecasts to attain higher crop production during 2013-14 as compared to 2012-13. This would be possible with an increase in the coverage of area under cropping as well as the yield of crops. As per Second Advance Estimates for 2013-14 the expected rate of increase in the production of foodgrains would be from 56.05 lakh tonnes in 2012-13 to 85.46 lakh tonnes in 2013-14 (53.0%), groundnut from 7.85 lakh tonnes to 9.90 lakh tonnes (26.0%), cotton from 2.55 lakh bales to 3.18 lakh bales (25.0%) and sugarcane from 340.14 lakh tonnes to 375.46 lakh tonnes (10.0%). Ultimately the contribution of the agricultural sector to Gross State Domestic Product (GSDP) is anticipated to register a higher order growth 8.22 per cent during the current year 2013-14 as against the 5.0 percent contemplated during the 12th Five Year Plan.

4.2. Agricultural Performance during 2011 – 12 and 2012 – 13:

The agricultural sector witnessed a severe drought impacting the area, yield and production of all important crops in the State during 2012 – 13. This brought about a steep

Year	GSDP	Primary Sector	Agriculture
2008-09	32179336	3079411	2509330
2009-10	35663186	3279727	2673838
2010-11	40341573	3516987	2879460
2011-12 RE	43323803	3872767	3197598
2012-13 QE	44794362	3477727	2780764

RE- Revised Estimates, QE- Quick Estimates
Source: Department of Economics and Statistics, Chennai -6

fall of 13.04 percent in the Gross State Domestic Product (GSDP) of the agricultural sub sector between 2011 – 12 and 2012 - 13. As a result, the relative share of the sub sector in the primary sector declined from 83.0 percent in 2011 – 12 to 80.0 percent in 2012 – 13 and in overall State's GSDP from 7.4 percent to 6.2 percent.

The 'deficit rainfall' during the pre-monsoon period viz., January 2012 – May 2012 (-) 39.9 percent, South-West Monsoon period June 2012 – September 2012 (-) 24 percent and the 'uneven temporal spread' of the northeast monsoon (October +42.0%, November (-) 54.0% & December (-) 62.0%), coupled with non-release of Cauvery water for agricultural purposes by Karnataka State and depletion of groundwater level had its adverse impact on 'surface' and 'sub-surface' water level during the year 2012 – 13. As against the total storage capacity of 198.384 tmcft in 15 major irrigation reservoirs in the State, the live storage by the end of December 2012 was only 31.28 tmcft (16%). The storage in these reservoirs in 2011 was comfortably high at 68.0 percent and the live storage was 134.70 tmcft. The average water levels in 1,261 observation wells maintained by Tamil Nadu Water Supply and

Higher than the State Average (Districts recording)	Lower than the State Average (Districts recording)
Ariyalur (5.9), Coimbatore (7.9), Dindigul (3.3), Erode (5.1), Madurai (7.5), Perambalur (6.7), Pudukkottai (2.3), Salem (4.3), Theni (7.7), Tirunelveli (5.3), Tiruppur (4.0), Thiruvallur (3.9), Tiruchirappalli (5.6) and Virudhunagar (2.3).	Cuddalore (1.6), Dharmapuri (0.9), Kancheepuram (1.6), Kanniyakumari (1.3), Karur (0.7), Krishnagiri (0.5), Nagapattinam (1.9), Namakkal (0.3), Ramanadhapuram (1.4), Sivagangai (1.0), Thanjavur (0.6), Tuticorin (0.9) and Thiruvannamalai (1.4).

Note: 1. The ground water levels in three districts viz., Vellore, Thiruvallur and Viluppuram did not experience any fall.
2. Figures in brackets indicate the fall in the level of ground water in meters.
Source: Tamil Nadu Water Supply and Drainage Board, Chennai – 5.

Drainage (TWAD) Board throughout the State, experienced a fall in ground water table. The average fall in the ground water level in the State between January 2012 and 2013 was from 5.37 meters to 7.34 meters i.e., by 1.97 meters.

As against the normal rainfall of 921.0 mm, the total quantum of rainfall received during the year 2012 –13 was 743.1 mm. Eventhough it was rated as normal, the continuous long dry spell in the State, had its adverse impact on ‘surface’ and ‘sub-surface’ water caused ‘drought’ affecting agricultural activities in the State.

The adverse effect of the drought got reflected in the reduction in gross area sown by 12.7 percent, gross area irrigated by 15.0 percent and increase in fallows by 17.3 percent in 2012 – 13 as compared to 2011 – 12. The cropping intensity declined from 118.1 percent in 2011-12 to 113.1 percent in 2012-13 and that of irrigation intensity from 119.0 percent to 113.2 percent.

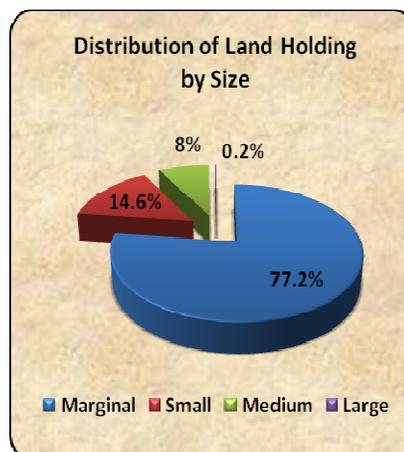
Category	2010-11	2011-12	2012-13
1. Fallows (Current + Others)	25.95	25.61	30.04
2. Area sown:			
a. Net	49.54	49.86	45.44
b. Gross	57.53	58.90	51.40
3. Area Irrigated:			
a. Net	29.12	29.64	26.43
b. Gross	33.48	35.19	29.91

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

Based on the report of the High Level Committee and taking into account the prevailing drought situation, in February 2013, the Government declared 31 districts of Tamil Nadu except Chennai as drought-affected and sanctioned various relief measures separately for delta and non-delta districts. Apart from this, a Drought Memorandum seeking assistance of Rs.19, 665.13 crore was sent to Government of India.

4. 3. Land Holdings:

A combination of factors such as increasing industrialization, urbanization, housing activities and infrastructure development triggered the conversion of agricultural land into non agricultural uses. This has resulted in a decline of the area under cultivation. The scope for expansion of the area available for cultivation is also very limited. The pattern of land ownership imposes limitations on the models that can be adopted for agricultural development. As per the latest Agricultural Census 2010-11, marginal and small holdings of less than 2 hectares accounted for 92.0 percent of the total holdings and 61.0 percent of the total operated area. They in turn are unsuitable for conventional technology and machinery use to boost agricultural production. This led to a process of marginalization of small and marginal farmers and casualization of agricultural labourers. To derive the best results and to empower marginal and small farmers, they may be motivated to form farmers’ groups so as to get all the technical inputs in time and to ensure judicious use of various scarce resources.



The total number of operational land holdings in the State declined from 81.93 lakh in 2005 – 06 to 81.18 lakh in 2010 – 11 (0.9%). This implies that the farmers may have given up their cultivation because of the lucrative price offered for land on account of fast urbanization. This was more prevalent in the vicinity of urban areas. Among the districts, the number of land holdings was the lowest in The Nilgiris (64,369) and the highest in

Villuppuram (6,15,543). Tamil Nadu's share of the total all-India operational holdings as per the 2010-11 Agricultural Census at 137.8 million was 5.9 percent. With continuous fragmentation of small (1 to 2 hectares), medium (2 to 10 hectares) and large (10 hectares

Table No.4.5 Distribution of Number of Holdings and Area Operated in Tamil Nadu as per Agriculture Census

Category	Number of holdings (lakhs)		Area operated (lakh. ha.)		Average size of holdings (ha.)	
	2005-06	2010-11	2005-06	2010-11	2005-06	2010-11
Marginal (< 1 hectare)	62.28	62.66	22.86	22.92	0.37	0.37
Small (1 to 2 hectare)	12.34	11.82	17.21	16.44	1.39	1.39
Medium (2 to 10 hectare)	7.12	6.53	24.26	22.03	3.41	3.37
Big (> 10 hectare)	0.19	0.17	3.91	3.50	20.58	20.59
Total	81.93	81.18	68.24	64.88	0.83	0.80

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

and above) holdings, the number of marginal holdings increased in the State from 62.28 lakh to 62.66 lakh (0.6%) between the two Censuses. The share of marginal and small holdings in total holdings in the State rose from 91.1 percent to 91.7 percent. It was 85 percent at the all-India level.

The total area operated also declined from 68.24 lakh hectares in 2005 – 06 to 64.88 lakh hectares in 2010 – 11 (4.9%). Of the total area operated in all India at 159.2 million hectares, Tamil Nadu accounted for 4

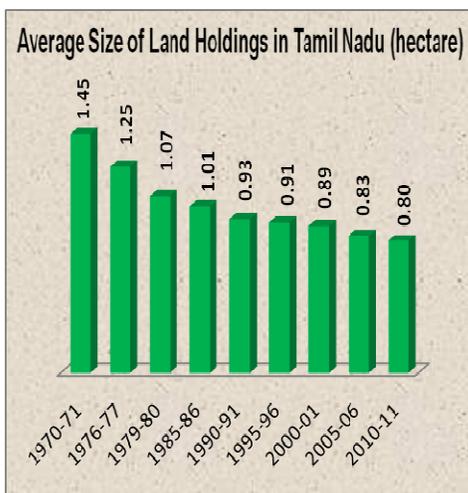


Table No.4.6 Average size of Land Holding by Districts

District above the State level		District below the State level	
1. Tiruppur	2.00	1. Kancheepuram	0.66
2. Coimbatore	1.81	2. Thiruvallur	0.59
3. Karur	1.42	3. Vellore	0.65
4. Erode	1.35	4. Thiruvannamalai	0.68
5. The Nilgiris	1.25	5. Villupuram	0.67
6. Thoothukudi	1.22	6. Cuddalore	0.72
7. Dindigul	1.06	7. Thanjavur	0.72
8. Theni	1.00	8. Dharmapuri	0.77
9. Virudhunagar	0.93	9. Tiruchirappalli	0.78
10. Thiruvarur	0.92	10. Perambalur	0.75
11. Namakkal	0.91	11. Pudukkottai	0.59
12. Nagapattinam	0.86	12. Ramanadhapuram	0.72
13. Salem	0.84	13. Sivagangai	0.62
		14. Madurai	0.58
		15. Tirunelveli	0.72
		16. Kanniyakumari	0.22
		17. Krishnagiri	0.80
		18. Ariyalur	0.58
State	0.80		

Source: Department of Economics and Statistics, Chennai - 6

percent. The average size of land holding in the State further reduced from 0.83 hectare in 2005-06 to 0.80 hectare in 2010-11. The average size of land holding at the all-India level was comparatively higher at 1.16 hectare.

Among the districts as per the Agriculture Census 2010-11, the average size of land holding was in the range of 0.22 hectare in Kanniyakumari to 2.00 hectare in Tiruppur. Out of 31 districts, in as many as 18 districts the average size of holdings was below the State's average (0.80 hectare). The small size of land holdings inhibits investment in productivity-enhancing measures and makes many agricultural holdings sub-optimal.

The average size of large holdings at 20.58 hectares in Tamil Nadu was higher than the all-India average size 17.38 hectares. In Tamil Nadu, the average size of marginal

holdings at 0.37 hectare, small holdings at 1.39 hectare and medium holdings at 3.37 hectare were somewhat smaller than that of all-India at 0.38 hectare, 1.42 hectare and 3.60 hectare respectively.

Of the total land holdings in State, institutional holdings accounted for a meagre share of 0.24 percent and in the total operated area its share was 2.05 percent. Among the districts, the number of institutional holdings ranged between 63 in Salem and 2,583 in Kanniyakumari.

4.4. Performance of Principal Crops:

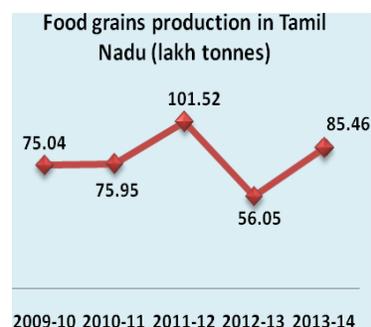
Achieving food security by increasing agricultural production forms the core of agricultural development strategy in the State. This policy assumes greater significance with the increasing population and accelerating economic growth. A number of programmes have been launched for increasing production of agricultural commodities in the State at different points of time. Thanks to the favourable temporal and spatial spread of rainfall and adequate availability of water both in surface and sub-surface flow for irrigation, the production of principal crops in the State witnessed increase in 2011-12 as compared to the previous year 2010-11. The increase in production was mainly adduced to the increase in yield rate of crops rather than that of area. In 2012-13, the situation was entirely different. The prolonged dry spell, the deficit rainfall during South-West Monsoon, the uneven temporal spread during the North-East Monsoon and the decline in water availability in surface and sub-surface sources for irrigation produced adverse effect on cropped area and area irrigated. On the other hand, there was an increase in fallows caused by the wide spread drought. The area, yield and production of all crops in the State were affected during 2012-13. The fall in yield was more pronounced than that of area.

Crops	2011-12			2012-13			2013-14 [#]		
	A	Y	P	A	Y	P	A	Y	P
Paddy	19.04	3918	74.59	14.93	2712	40.50	18.49	3097	57.26
Millets	6.38	3643	23.24	6.42	2092	13.42	9.10	2747	25.00
Pulses	6.67	554	3.69	5.11	415	2.13	7.73	414	3.20
Foodgrains	32.09	3164	101.52	26.46	2118	56.05	35.32	2420	85.46
Sugarcane [@]	3.46	113	389.75	3.48	98	340.14	3.58	105	375.46
Cotton*	1.36	481	3.82	1.33	326	2.55	1.50	361	3.18
Oilseeds	4.49	2481	11.14	3.90	2092	8.16	4.61	2245	10.35

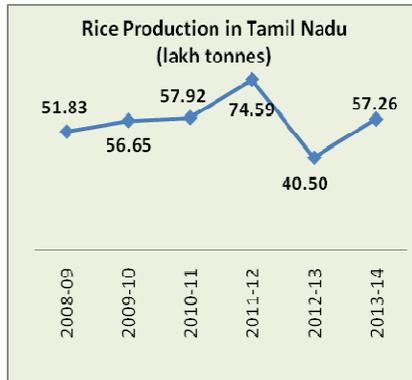
*Note: A – Area in lakh hectares; Y – Yield in kgs per hectare; P - Production in lakh tonnes * in terms of lint; @ - in terms of cane # - Forecast estimates.*

Source: Department of Economics and Statistics, Chennai – 6

During 2011-12, there was an all-time high production of foodgrains at 101.52 lakh tonnes. However, a wide spread drought during 2012-13 triggered a steep decline in foodgrains production to 56.05 lakh tonnes (45.0%). The fall in the production of all constituents of foodgrains viz., rice, pulses and millets caused the overall decline in foodgrains production during 2012-13. Among them the fall in rice production was much pronounced. In the case of production of rice, it fell from 74.59 lakh tonnes in 2011-12 to 40.50 lakh tonnes in 2012-13 (46.0%). It was mainly due to the fall in yield rate of rice rather than the drop in area. The area under paddy declined by 22.0 percent and that of yield by 31.0 percent between these two years. The per hectare yield rate

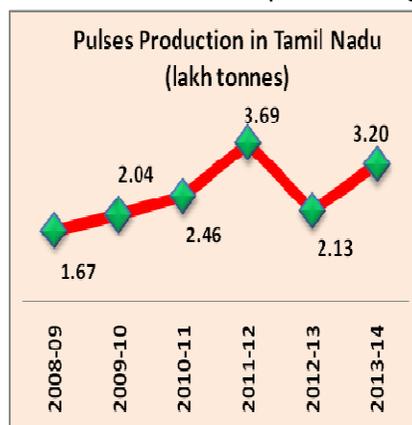


of paddy (in terms of rice) at 3,918 kgs during the year 2011-12 was the best. In 2012-13 it declined to 2,712 kgs. However, the yield rate of the crop also varied within the State as well as among the seasons significantly. Across the State the yield rate of paddy ranged between 588 kgs per hectare in Ramanathapuram and 4728 kgs per hectare in kanniyakumari districts in 2012-13. Among the seasons, the normal yield (average for the 5 years ending 2011-12) obtained at 3,799 kgs per hectare in Kar/Kuruvai/Sornavari season was the highest as compared to 2,913 kgs in Samba/Thaladi/Pisanam and 3,552 kgs in Navarai/Kodai. In the light of limited scope for expanding area under cultivation and under irrigation, the only way to meet the growing food requirement, is to narrow down the vast gap in the yield rate among the districts as well as between the seasons. This calls for the need for renewed research effort to narrow down the yield gap. In 2013-14, it is anticipated to cover 18.49 lakh hectares under paddy and to produce 57.26 lakh tonnes of rice.



Coarse cereals comprise crops like jowar, cumbu, ragi, maize and other small millets (korra , varagu, samai) which have traditionally been the main components of the food basket. These crops are being grown predominantly in rainfed conditions. Changing consumption pattern, non-adoption of the recommended doses of inputs due to high risk under rainfed agro-climatic conditions, non-availability of high yielding variety quality seeds particularly of small millets, lack of assured procurement and poor resource base of the farmers who largely grow these crops are the limiting factors in increasing the area and production of coarse cereals. The total millets production in the State dwindled from 23.24 lakh tonnes in 2011-12 to 13.42 lakh tonnes in 2012-13 (42.3%). Eventhough the area increased by 0.6 percent between these two years, the fall in yield rate by 43.0 percent caused on overall decline in millets production. With the increase in the coverage to 9.10 lakh hectares during 2013-14, the total production of coarse cereals is likely to go up to 25.0 lakh tonnes.

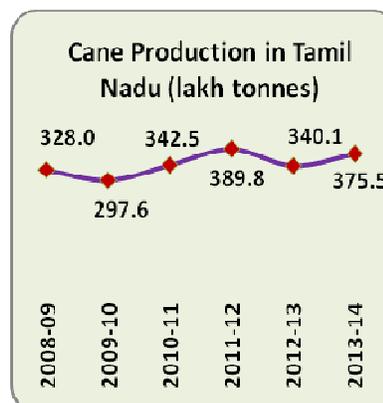
Being rich in protein, pulses not only form a vital part of the human diet, but also play a crucial role in balancing the dietary proteins. The major pulse crops grown are green gram (24.6%), black gram (46.2%) and horse gram (10.3%) which accounted for 81.1 percent of the total area under pulses in the State in 2011-12. Cultivation of pulses is mostly (89.4% of the area) under rainfed condition on marginal lands with less fertile soil by resource-poor farmers. The wide spread drought also affected the area, yield and production of pulses during 2012-13. The decline in area was 23.4 percent and in yield was 25.1 percent. This caused a fall in pulses production in the State from 3.69 lakh tonnes in 2011-12 to 2.13 lakh tonnes in 2012-13 (42.3%). The average yield rate of pulses in the State even at its peak at 554 kgs per hectare during 2011-12 was short of the all India average 694 kgs per hectare. The total area under pulses is likely to go up to 7.73 lakh hectares in 2013-14 and the anticipated production is 3.20 lakh tonnes. Non- availability of high yielding varieties, low Seed Replacement Rate (SRR), high susceptibility to pests are the primary reasons for low yield of pulses. To



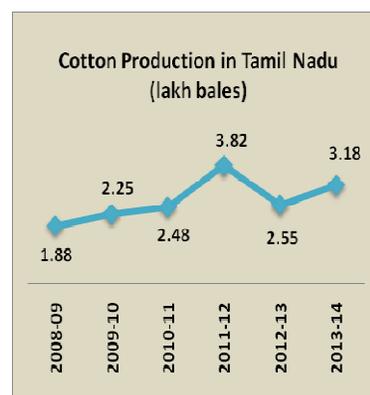
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attain higher levels in yield rates focus needs expansion in area under micro irrigation, more use of micro nutrients, adoption of improved production practices and evolving better yielding seeds.

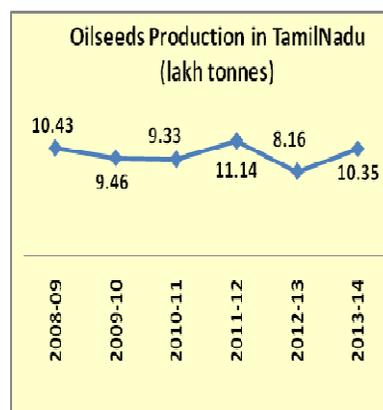
Sugarcane is the most important cash crop in the State which is widely cultivated in irrigated conditions. Despite drought, the crop's coverage did not suffer during 2012-13. In fact, it increased from 3.46 lakh hectares in 2011-12 to 3.48 lakh hectares in 2012-13 (0.6%). Fixing of a higher State Advised Price (SAP) by the State Government at Rs.2,350/- per tonne linked to 9.5 percent recovery rate in 2012-13 as compared to that of Government of India's Statutory Minimum Price of Rs. 1,700/- per tonne and the increase in area registered with sugar mills under the crop from 2.75 lakh hectares in 2011-12 to 2.81 lakh hectares in 2012-13 were responsible for enlarging the crop's coverage. Contrary to this trend, the yield rate fell from 113 tonnes per hectare in 2011-12 to 98 tonnes per hectare in 2012-13. The fall in yield rate was responsible for the decline in cane production from 389.75 lakh tonnes in 2011-12 to 340.14 lakh tonnes in 2012-13 (12.7%). The recovery rate of cane also declined from 9.35 to 8.68 percent between these two years. This underlines the need for evolving new varieties having more sugar content. The cane production during 2013-14 is likely to be of the order of 375.5 lakh tonnes. The State Government has increased the State Advised Price to Rs.2,650/- per tonne this year.



Highly as volatile cotton prices and high cost of pest control are the two major factors that limit the expansion of area under cotton in the State. The area under this crop marginally fell from 1.36 lakh hectares in 2011-12 to 1.33 lakh hectares in 2012-13 (2.2%) and the yield rate (lint) from 481 kgs to 326 kgs (32.2%). They triggered the decline in production from 3.82 lakh bales to 2.55 lakh bales (33.2%) of cotton in the State. During 2013-14 the coverage under the crop would be 1.50 lakh hectares and that of production 3.18 lakh bales. Developing cotton varieties suitable for increasing yield, especially, under rainfed conditions, continuous follow up of pest monitoring and advisory services are some of the issues meriting serious attention to increase the production and productivity of cotton in the State.



Oilseeds cultivation is undertaken across the State on marginal lands, dependent on monsoons with low level of input usage. Of the total area cultivated under oilseeds edible oilseeds accounted for 99.0 percent and rest being non-edible oilseeds. The prominent oilseeds raised were groundnut, gingelly, castor and sunflower. The temporal and spatial spread of rainfall during the year 2012-13 was not beneficial to raising of oilseeds. Consequently, the total area cultivated under these crops and the average yield rate declined from 4.49 lakh hectares in 2011-12 to 3.90 lakh hectares in 2012-13 (13.1%) and from 2,481 kgs to 2,092 kgs (15.7%) per hectare respectively. This brought about a fall in the overall production of oilseeds in the State from 11.14 lakh tonnes to 8.16 lakh tonnes (26.8%) between these



two years. During 2013-14 the production would be of the order of 10.35 lakh tonnes. The following measures are needed to improve the area, yield and production of oilseeds: i) minimizing the wide inter-district variations in the yield level by adopting suitable package of practices and ii) evolving hybrids/high yielding varieties having more oil content but at the same time weathering the natural calamities and pest and diseases attack.

4.5 Horticulture:

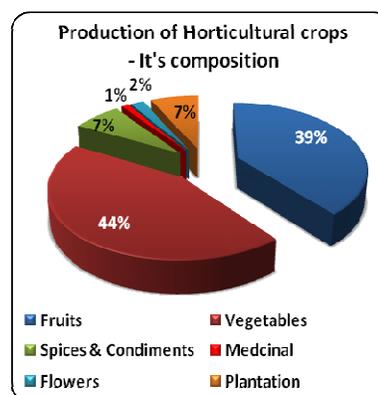
In the context of increasing population, swelling urbanization and a favourable shift in consumption of fruits and vegetables, there is a need for covering larger areas under horticulture crops. Horticulture crops in Tamil Nadu account for nearly 17 percent of the total cropped area. There has been a steady increase in the area covered under horticulture crops in the recent past. The total area covered under horticulture crops in the State moved up from 10.01 lakh hectares in 2011-12 to 10.81 lakh hectares in 2012-13 (8.0%) and would further rise to 11.46 lakh hectares in 2013-14 (6.0%). Fruits, vegetables, spices and condiments and plantation crops together claimed a share of 96.0 percent of the total area covered under horticultural crops. The overall yield rate exhibited a steady improvement. The average yield rate of horticultural crops per hectare improved from 15.24 tonnes in 2011-12 to 16.09 tonnes in 2012-13 (5.6%) and would further improve to 16.69 tonnes in 2013-14 (3.7%). The increase in area and yield rate helped to augment the total production of horticultural crops from 152.62 lakh tonnes in 2011-12 to 173.99 lakh tonnes in 2012-13 (14.0%) and further to 191.31 lakh tonnes in 2013-14 (10.0%).

Crops	2011-12			2012-13			2013-14 [#]		
	A	Y	P	A	Y	P	A	Y	P
Fruits	2.87	20.48	58.77	3.10	21.62	67.00	3.29	22.43	73.70
Vegetables	2.54	27.25	69.27	2.74	28.77	78.96	2.90	29.95	86.79
Spices & Condiments	1.65	6.11	10.05	1.78	6.44	11.46	1.88	6.69	12.61
Plantation Crops	2.55	4.12	10.50	2.75	4.34	11.97	2.92	4.51	13.16
Medicinal and aromatic crops	0.14	9.20	1.29	0.15	9.73	1.48	0.16	9.91	1.62
Flowers	0.26	10.35	2.74	0.29	10.92	3.12	0.31	11.12	3.43
Total Crops	10.01	15.24	152.62	10.81	16.09	173.99	11.46	16.69	191.31

Note: A – Area in lakh hectares; Y – Yield in tonne per hectare; P - Production in lakh tonnes
- Forecast estimates. Source: Department of Horticulture and Plantation Crops, Chennai-5

During the Eleventh Five Year Plan, the State schemes viz., the Integrated Horticulture Development Schemes (IHDS) (Rs.28.59 crore), Integrated Tribal Development Programmes (ITDP) (Rs.2.0 crore), Western Ghats Development Programme (WGDP) and Hill Area Development Programme (HADP) (Rs. 12.40 crore) and National Agricultural Development Programme (NADP) (Rs. 182.45 crore) were implemented. The Centrally-Sponsored Schemes like National Horticulture Mission (NHM) (Rs. 479.01 crore), National Mission on Micro Irrigation (NMMI) (Rs. 256.01 crore), National Bamboo Mission (NBM) (Rs.

3.73 crore) and National Mission on Medicinal Plants (NMMP) (Rs. 27.30 crore) were also in operation. The State also implemented the World Bank assisted IAMWARM project (Rs. 72.0 crore) for expansion of area with high value horticultural crops in 61 sub-basins in Tamil Nadu. Under precision farming, an extent of 22,294 hectares was covered and 1,238



clusters were established during 2008-11. During the Eleventh Five Year Plan period, an area of 91,130 hectares was brought under micro irrigation. All these schemes have gone a long way towards enhancing the production of horticultural crops.

Even though many schemes are being implemented for the promotion of horticulture crops, yet the following impediments are still at work: i) the perishable nature limits the extent of market and transaction opportunities; ii) prices are highly volatile due to seasonal conditions; iii) inadequate and timely availability of pedigree planting materials; iv) period of waiting is significantly long for those seeking quick return and v) lack of technical guidance for increasing the productivity per unit of area due to weak extension machinery.

4.6 Trend in Overall Agricultural Production:

Index of Agricultural Production is the summary measure which shows the pulse of the performance in agricultural sector. In view of the fact that the performance of the agricultural sector displays wide variations from year to year, the trends in area, yield and production are analyzed during the 10th (2002-03 to 2006-07) and 11th (2007-08 to 2011-12) Five Year Plan periods.

The overall agricultural production in the State had gone up at an annual average growth rate of 7.29 percent during the 10th Five Year plan period (2002-2007). This accomplishment is mainly due to the increase in yield rate of crops. There was an overall decline in area by 0.42 percent in this period. During this Plan period, the production of food crops fared better than non-food crops. Turning to 11th Five Year Plan period (2007-2012), the overall agricultural production in the State declined by an annual average rate of 2.37

Crops	10 th Plan period			11 th Plan period		
	A	Y	P	A	Y	P
Food	0.17	5.11	7.94	(-)5.76	(-)2.65	(-)3.08
Non-food	(-)2.31	6.15	5.96	(-)1.67	0.56	0.33
All	(-)0.42	5.24	7.29	(-)0.35	(-)1.96	(-)2.37

Source: Compiled and Computed from the data received from the Department of Economics and Statistics – Chennai-6.

percent. The fall both in area and yield rate of crops was mainly responsible for this decline during the 11th Plan period. As between food and non-food crops, even though the latter registered a growth of 0.33

percent, the decline in the production of food crops by an annual average 3.08 percent engendered the fall in the overall agricultural production in the State. In the case of food crops, both area and yield rate witnessed negative growth in this Plan period. In respect of non-food crops, only the area under the crops registered a fall and the increase in yield rate of crops compensated the fall in area and contributed to the overall increase in production.

4.7 Yield Gap:

The yield gap is also a major issue that contributes to agricultural stagnation in the State. There is considerable yield gap between on-farm trials and yield actually realized by the farmers. Except paddy, there is significant yield gap in other crops. The yield gap is around 50.0 percent of the potential yield. This is because the adoption of agronomic practices has not been uniform and widespread. Agricultural

Crop	Potential Yield (Kgs/ha.)	Average Yield (Kgs/ha) (2011-12)	Yield Gap (Kgs/ha.)
Paddy	6000	3918	2082
Red Gram	1500	870	630
Black Gram	1270	580	690
Sugarcane	146000	113000	33000

*Source: 1. Agriculture Development Strategy for Tamil Nadu – 2004, State Planning Commission, Chennai – 5. (page-22)
2. Department of Economics and Statistics, Chennai - 6*

strategy has to focus attention towards bridging the gap between the potential yield and the actual yield realized.

4.8 Self-Reliance in Production:

The ICMR had estimated the per capita per day nutritional requirement of rice at 370 grams and pulses at 70 grams. Based on these norms the total requirement of these agricultural commodities for 2013-14 was worked out. A comparison was made with the total estimated requirement and production.

There was a shortfall between the requirement and the estimated production level of rice and pulses. The gap was particularly significant in respect of pulses and illustrates that self sufficiency in food production in Tamil Nadu is some way off.

Commodities	Estimated Requirement in a year (Lakh tonnes)	Anticipated Production*
		(Lakh tonnes) 2013-14
Rice	92.63	57.26
Pulses	10.01	3.20

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

4.9 Loss of Agricultural Production due to Natural calamities:

During 2011-12, a cyclone caused extensive damages to paddy, millets, pulses, sugarcane, groundnut and coconut in the districts of Cuddalore, Villupuram, Thanjavur, Nagapattinam, Thiruvarur, Kancheepuram, Thiruvallur, Dharmapuri and Thiruvannamalai during the fag end of the North-East Monsoon period. The total area affected was 1.88 lakh hectares and the total value of production loss amounted to Rs. 968.73 crore. The relief measures were sanctioned to the level of Rs.174.24 crore benefiting 2.91 lakh farmers.

Coupled with the prolonged dry spell since January 2012, the deficit rainfall during the South-West Monsoon and the uneven temporal and spatial spread of rainfall during the North-East Monsoon caused widespread drought in the State during 2012-13. The State Government declared 31 districts of Tamil Nadu except Chennai as drought affected and sanctioned various relief measures to mitigate the sufferings of the farmers. In overall terms the total area and production affected by drought in the State during the year was estimated at 10.01 lakh hectares and 32.42 lakh tonnes respectively. The total value of loss of crop production was estimated at Rs. 3475.45 crore in the State. On an average, the loss of crop production per hectare worked out to Rs.34,719. In the case of food crops, the total area affected by drought was 8.68 lakh hectares (86.7%) and production was 20.90 lakh tonnes (64.5%). The total estimated value of loss of foodcrop production was Rs. 2770 crore (79.7%). The total area affected under non food crops was 1.33 lakh hectares (13.3%). The quantum of production under non-food crops affected by drought in the State was 11.52 lakh tonnes (35.5%) and the estimated loss of value was Rs.705 crore (20.3%). The State had sanctioned relief measures to the tune of Rs. 1,143 crore benefiting 20.33 lakh farmers. Of the total farmers benefited, those raising food crops accounted for 89.0 percent and the rest of the 11.0 percent were non-food crops cultivators.

Natural Calamities	2011-12 (Cyclone)	2012-13 (Drought)
Area Affected (Lakh hectares)		
Food Crop	1.65	8.68
Non-food crop	0.23	1.33
Value of Crop loss (Rs. Crores)		
Food Crop	667.39	2770.48
Non-food Crop	301.34	704.98
Relief measures sanctioned (Rs. crores)	174.24	1143.26
Farmers benefited (No. Lakhs)		
Food Crop	2.55	18.07
Non- food crop	0.36	2.26
Area benefited (Lakh hectares)		
Food Crop	1.65	5.09
Non-food crop	0.23	1.33

Source: Department of Agriculture, Chennai-5.

4.10 Input Management:

Crop production is essentially a function of the interplay of natural resources such as land, water, soil, biodiversity with the plant genetic material i.e. use of quality seeds and use of other agricultural inputs like chemical fertilizers, organic manure, pesticides, farm machinery and equipment, labour, credit and insurance, pricing policy and marketing infrastructure. This section highlights the present status regarding the availability and access of agricultural inputs like seeds, fertilizers, pesticides, and credit which determine agricultural productivity and production.

4.10.1 Irrigation:

The annual per capita water availability in India is about 2200m³ whereas it is only about 750 m³ in Tamil Nadu. There are about 81 reservoirs, 41,127 tanks and 18.21 lakh

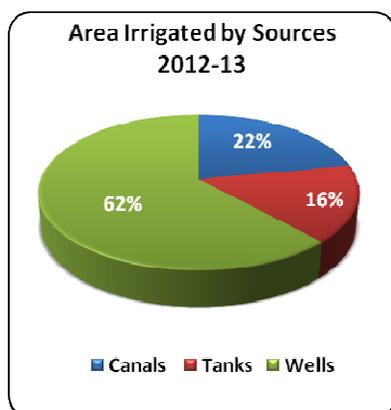
Name of Reservoirs	Actual Capacity	2011-12	2012-13
Mettur	93470	87232	46897
Bhavanisagar	32800	20942	6377
Periyar	10570	6269	3361
Sathanur	7321	6875	2342
Vaigai	6091	5986	3460
Manimuthar	5511	3657	3098
Papanasam	5500	5304	2105
Pechiparai	4450	4082	1256
Amravathy	4047	4042	2049
Perunchani	2890	2048	755
Krishnagiri	1666	1580	1452
Sholayar	5052	5298	5117
Parambikulam	13408	13392	7391
Aliyar	3864	3857	2592
Thirumurthy	1744	1693	1555
Total	198384	172257	89807

Source: Chief Engineer, Public Works Department, Chennai – 5.

wells in the State. The total storage capacity of 15 major reservoirs in the State is 198.38 tmcft. Against which water realization stood at 172.26 tmcft in 2011-12 (86.8%). Due to wide spread drought, water realization in the reservoirs in the State was restricted to 89.8 tmcft in 2012-13 (45.3%). The decline in ground water table across the State is a matter of serious concern. As a result, out of 386 blocks in the State, 139 blocks are categorized as over-exploited, 33 blocks as critical, 67 blocks as semi-critical, 11 blocks as poor quality and the balance 136 blocks as safe.

The total net area irrigated in the State by all sources of irrigation declined from 29.64 lakh hectares in 2011-12 to 26.43 lakh hectares in 2012-13 (10.8%). There was a fall in gross area irrigated from 35.19 lakh hectares to 29.91 lakh hectares (15.0%). Canals accounted for

22.0 percent, tanks for 16.0 percent and wells for 62.0 percent. Eventhough the drought had its adverse effect on net area irrigated by different sources, it was more pronounced in the



Sources	2011-12	2012-13*
Canals	7.46	5.90
Tanks	5.28	4.20
Wells	16.83	16.26
Others	0.07	0.07
Total	29.64	26.43

*Note - * Provisional, Source: Department of Economics and Statistics – Chennai-6.*

case of surface flow sources. It was 20.4 percent in the case of tanks and 20.9 percent in respect of canals. The fall in net area irrigated by wells during 2012-13 was 3.4 percent as compared to 2011-12. The irrigation intensity in the State declined from 119.0 percent in 2011-12 to 113.2 percent in 2012-13.

Water demand is increasing rapidly due to population growth, urbanization and changing lifestyle. Owing to increasing demand of water for domestic, industrial and energy uses, there is a severe constraint in the availability of water for agriculture. Climate change

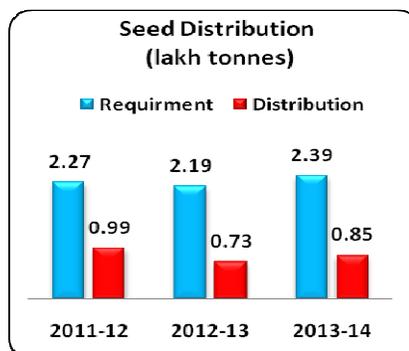
might complicate further the existing temporal and spatial variation in availability of water. Extreme events like floods and droughts are occurring more frequently and affecting livelihood and food security. Low water use efficiency and inadequate maintenance of irrigation systems are some of the major problems that confront the management of water resources in the State. There is a need to promote participatory management of aquifers to ensure sustainable and equitable use of water. Promotion of micro-irrigation techniques, alignment of cropping patterns with the availability of water and greater involvement and empowerment of Water Users' Associations in the command areas could lead to improvement in water use efficiency.

With a view to improve the service delivery of the irrigation system and to increase the productivity with effective integrated water resources management in a sub-basin frame work, a multi-sector project Irrigated Agriculture Modernization and Water Bodies Restoration and Management Project (IAMWARM) with financial assistance of World Bank is being implemented in the State . Between 2007-08 and 2013-14, project rehabilitation works in 4,549 tanks, 655 anaicuts and 8,018 k.m length of supply channels had been completed to benefit 6.69 lakh hectares with an expenditure of Rs.1,284 crores. With the financial assistance of the Central and State Governments (50:50), the Command Area Development Programme is currently being implemented in the State in Vaigai reservoir, Kodanar reservoir, Varadhamanadhi reservoir, Kalingarayan anaicut, Pelandurai anaicut, Cheyyur anaicut, Ellis anaicut and Manimutharu nadhi system. During 2012-13, on-farm development works were carried out to benefit 18,262 hectares at a cost of Rs.27.95 crore and Rotational Water Supply to benefit 18,267 hectares at a cost of Rs.0.60 crore. In 2013-14, on-farm development works are to be taken up to benefit an extent of area of 4,778 hectares at a total cost of Rs.38.83 crore under this programme. Rotational Water Supply works are also to be taken up to benefit 3,213 hectares at a cost of Rs.0.78 crores.

Rehabilitation and modernization of irrigation structures is taken up under the National Agriculture Development Programme. For 2012-13, out of 14 works accorded sanction at a cost of Rs. 9.21 crore, 7 works were completed. The 13th Finance Commission had recommended a grant of Rs. 200 crores for restoration of 674 traditional water bodies over a period of four years since 2011-12. During 2012-13, 175 works were taken up at a cost Rs. 50 crore. The Government has taken initiatives to replenish the ground water potential through rain water harvesting and recharge structures. Under Master Plan Artificial Recharge Scheme, the State had sanctioned Rs.550 crores towards restoring the depleted aquifers through construction of check dams across rivers, streams, percolation ponds and recharge shafts. Under the scheme, as against the target of 523 works, 429 works were completed at a total cost of Rs.199.66 crore up to 2012-13. The remaining 94 works at a cost of Rs. 65.45 crore are being taken up during the year 2013-14. Under various schemes, 82 percolation ponds at a cost of Rs.4.55 crore and farm ponds numbering 320 were created at a cost of Rs.2.05 crore.

4.10.2 Seeds:

Quality seeds and planting materials are key agricultural inputs, which determine the productivity of crops. It is estimated that the quality of seed accounts for 20-25 percent of productivity. As a result of the adverse weather conditions, the quantum of supply of seeds in the State declined from 99,390 tonnes in 2011-12 to 73,033 tonnes in 2012-13. In 2013-14 (upto Feb



2014), the supply of seeds is 84,530 tonnes. However, as against the total estimated requirements, there was a persistent short fall in the supply of seeds by the organized sector (public and private) in the State. The short fall was conspicuous in respect of pulses, oil seeds and millets. The organized sector had met only 43 to 45 percent of the total seed requirements in the State. A larger portion of seed requirement i.e. about 57 to 55 percent continues to be met from the unorganized sector i.e., mainly farm-saved seeds. Of the total quantum of seeds distributed by the organized sector during 2012-13, paddy alone accounted for 78.0 percent. As against the stipulated seed replacement rate of 33.0 percent in respect of paddy, pulses and oilseeds and 50.0 percent for millets and cotton, the actual rate fell short of in the case of pulses and oilseeds.

There is a need to develop better varieties/hybrids/planting materials, which will be able to manifest itself even under challenging agro-climatic conditions. The provision of subsidy for seeds for newer and older varieties needs to be rationalized. The time is right to prepare a long term Seed Plan for the State keeping in mind the agro-climatic conditions, farmers' requirements, SRR of the crops, State's crop calendar and any contingent situations that may arise in order to ensure availability of quality seed at the right time to the farmers. In the absence of such a seed plan, farmers are forced to fall back on 'farm-saved' seeds or Truthfully Labelled Seeds. Steps need to be taken to prepare a Seed Plan for 5 years. Seed Replacement needs the serious attention it deserves.

Crop	2011-12			2012-13			20013-14 (Upto Feb' 2014)		
	Require - ment	Distri- bution	SRR %	Require --ment	Distri- bution	SRR %	Require -ment	Distri- bution	SRR %
Paddy	110000	75250	68	78920	56716	72	100000	65000	65
Millets	12153	6693	55	10637	5398	51	11733	8806	75
Pulses	24000	4800	20	20800	4768	38	20800	4373	29
Oilseeds	80612	12092	15	108186	5601	11	105638	5862	13
Cotton	555	555	100	550	550	100	555	489	88
Total	227320	99390		219093	73033		238726	84530	

Source: Department of Agriculture, Chennai – 5.

4.10.3 Integrated Nutrient Management:

Chemical fertilizers are the immediate source of nutrients in the soils. In the State, a total number of 11,780 retail outlets effect fertilizer distribution of which private retail outlets accounted for 63.0 percent and the rest being co-operative outlets. With the decline in cropped area as well as irrigated area consequent to the widespread drought, the total

Nutrients	2011-12	2012-13	2013-14*
Nitrogenous	10.40	9.28	9.03
Phosphorus	3.57	2.29	2.30
Potash	4.16	2.17	2.55
Total	18.13	13.74	13.88
Per hectare (Kgs)	438	235	308

*Note: *- Anticipated*
Source: Department of Agriculture, Chennai – 5.

consumption of nitrogenous (N), phosphatic (P), potassic (K) fertilizers in the State declined to 13.74 lakh tonnes in 2012-13 from 18.13 lakh tonnes in 2011-12. Eventhough, the three constituents witnessed a shortfall during 2012-13, it was much sharper in phosphatic (P) and potassic (K). In 2013-14, with the normal monsoon and increase in cropped as well

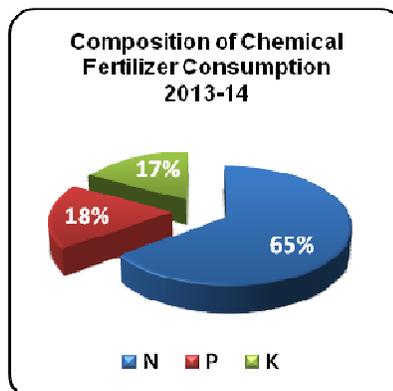
as irrigated area, the total fertilizer consumption in the State would likely to go up to 13.88 lakh tonnes.

The consumption of NPK in the State is found to be in the ratio of 4:1:1 in 2012-13 as against the conventionally accepted ratio of 4:2:1 indicating imbalances in the application of three chemical nutrients. Continuation of subsidy on urea while decontrolling phosphate and

potash fertilizers further adds to the inadvertent promotion of imbalance in fertilizer use on the one hand and excessive use of nitrogenous fertilizer on the other hand, leading to environmental pollution and lowering of profits to the farmers. The crop-wise consumption revealed that paddy alone accounted for more than 50 percent of the total fertilizer consumption in the State.

District above the State level		District below the State level	
1. Madurai	669	1. Thiruvaurur	224
2. Tiruchirappalli	659	2. Dindigul	220
3. Erode	519	3. Sivagangai	214
4. Salem	514	4. Karur	196
5. Theni	498	5. Cuddalore	177
6. Kancheepuram	366	6. Nagapattinam	175
7. Vellore	356	7. Ariyalur	166
8. Tirunelveli	335	8. Perambalur	157
9. Coimbatore	330	9. Thoothukudi	112
10. Pudukkottai	321	10. Dharmapuri	98
11. Thiruvallur	313	11. Ramanadhapuram	88
12. Thanjavur	272	12. Kanniyakumari	76
13. Thiruvannamalai	251	13. Namakkal	66
14. Villuppuram	246	14. The Nilgiris	55
15. Virudhunagar	237	15. Krishnagiri	55
		16. Tiruppur	7
State	235		

Source: Compiled and Computed from the data obtained from Department of Agriculture – Chennai-5



The average per hectare fertilizer consumption in the State declined from 438 kgs in 2011-12 to 235 kgs in 2012-13. In 2013-14, it is expected to be of the order of 308 kgs. The all-India average consumption of fertilizers remained stable at 144 kgs per ha in 2011-12 when compared to the previous year. Very high variability was observed in fertilizer consumption among the districts. Across the State, it was the highest in Madurai (669 Kgs) and lowest in Tiruppur (7 kg) districts in 2012-13.

The major constraints for adopting rational crop nutrition schedules are (a) high cost of straight fertilizers of nutrients other than NPK and Zinc; (b) lack of strong policy support from the Government of India for balanced fertilizer use and (c) lack of awareness among the farmers.

The Government is strictly monitoring the quality of the fertilizers through 14 Fertilizer Control Laboratories. During 2012-13, a total of 16,540 samples were tested of which 436 samples were found sub-standard. It was programmed to analyze 17,500 fertilizer samples during 2013-14.

Micro nutrients are best applied through fortification of major fertilizers. They have a significant impact on plant growth and life. A total quantity of 1,626 tonnes of micro nutrients were produced in 2012-13 and 1,392 tonnes were supplied. In 2013-14, it was programmed to produce 1,600 tonnes and to distribute entire quantity. The crop-wise micro nutrient distribution during 2012-13 reveals that paddy accounted for 68.3 percent followed by coconut (10.6%), groundnut (6.6%) cotton and millets (4.4% each) and pulses (3.4%) and the rest being other crops.

Crop	2011-12	2012-13	2013-14
Paddy	736.4	950.2	906.7
Groundnut	0.06	91.6	28.7
Millets	258.7	61.3	45.5
Cotton	1.00	61.6	11.8
Coconut	85.3	147.7	121.9
Pulses	13.5	46.9	20.5
Others	758.9	32.5	6.8
Total	1853.9	1391.8	1141.8

Source: Department of Agriculture, Chennai – 5.

A total quantity of 2,380 tonnes of bio-fertilizers was produced from the 15 centres out of which 2,180 tonnes were distributed to cover 4.88 lakh hectares benefitting 3.45 lakh farmers in 2012-13. In 2013-14, it is proposed to produce and distribute 3,850 tonnes of bio-fertilizers in the State.

Comprehensive and authentic database on micro nutrient/bio- fertilizer production and distribution in the State by public and private sectors needs to be built up for the benefit of all the stakeholders. With a view to ensure availability of true to type of micro nutrient/bio fertilizers to farmers; to curb sale of spurious and poor quality produce; to protect the rights of farmers; and to increase private participation in production and distribution, quality control needs to be enforced with utmost urgency on par with international standards.

4.10.4 Integrated Pest Management:

The protection of crops from predations of pests and diseases is a sine qua non for higher agricultural productivity, increased farm incomes and enhanced food security for the nation. Anecdotal evidence revealed that there is a production loss up to 30 percent due to incursion of pests and diseases. With the primary objective of reducing the use of harmful pesticides and integrating as many non-chemical methods, Integrated Pest Management (IPM) has been implemented in a cost-effective manner since late 1980s in the State. It emphasizes promoting eco-friendly, bio-pesticide technology at the field level. Consequent to the implementation of IPM Technology and the fall in area cultivated, the technical grade material consumption in the State which was 10,926 tonnes in 1984-85 drastically come down to 2,261 tonnes in 2011-12 and further to 2,207 tonnes in 2012-13. Between these two years it is noteworthy that use of chemical pesticides in the State declined from 385 grams per hectare to 375 grams per hectare. Compared to the global average of 500 grams of technical grade pesticide per hectare it was on the low side. The chemical pesticides are sold through 11,093 retail outlets of which 89.0 percent were in the private sector, 8.0 percent in the Government sector and 3.0 percent co-operatives. Consequent to the decline in area cropped due to widespread drought, the total area treated under various plant protection measures had come down to 35.72 lakh hectares in 2012-13 as against 38.30 lakh hectares in the previous year. Of the total area treated, paddy accounted for 42.0 percent followed by millets (19.0%), pulses (15.0%), sugarcane and groundnut (10.0% each) and cotton (4.0%).

Certain special initiatives that can be taken up for the effective implementation of IPM so as to produce safe and clean agricultural produce in a cost effective manner include: (a) training farmers on IPM Technology and educating them about the ill effects of indiscriminate use of pesticides; (b) encouraging the private sector to produce bio-pesticides; (c) regulating the sale of chemical pesticides and preventing misuse; (d) developing indigenous and cost effective pheromones; and (e) ensuring availability of critical inputs in right time.

4.10.5 Crop Insurance:

With a view to insulate the farmers against the loss occurred due to natural calamities, large scale outbreak of pests and diseases and to ensure credit worthiness for the ensuing season, the Agricultural Insurance Company of India Limited

Table No. 4.19 Crop Insurance			
Particulars	2011-12	2012-13	2013-14
Farmers Covered (Lakhs)	4.89	10.83	0.09
Sum Insured (Rs. Crores)	1686	3402	0.46
Area Covered (lakh Hectares)	7.03	12.35	0.15
Claims Paid (Rs Crores)	40	744	--
Farmers Benefitted (Lakhs)	0.42	5.57	--
Source: Agriculture Insurance Company of India Limited Chennai-1			

implements the National Agricultural Insurance Scheme in the State. The unit of insurance under the scheme is block depending on the area under the crop notified. Under the

scheme, the total number of farmers insured their crops in the State increased from 4.89 lakhs in 2011-12 to 10.83 lakhs in 2012-13. The total area insured under the scheme had gone up from 7.03 lakh hectares in 2011-12 to 12.35 lakh hectares in 2012-13 with the total sum insured at Rs.1,686 crores and Rs.3,402 crores respectively. In 2013-14 (up to October), 0.15 lakh hectares were insured for a sum Rs.46 crores. Of the total area covered, paddy, banana, black gram, sugarcane and maize together accounted for more than 90 percent in both the years. Claims to the tune of Rs.40 crore were paid to benefit 0.42 lakh farmers in 2011-12 and Rs. 744 crore to 5.57 lakh farmers in 2012-13. Research to evolve location specific insurance products and enhancing insurance education for the small and marginal farmers is the need of the hour.

The National Agricultural Insurance Scheme stipulates the premium level of 2.0 percent to 3.5 percent of the sum insured. Of this, the State has extended 50 percent premium subsidy enabling the farmers only to pay 1.0 percent to 1.75 percent of the sum insured. The Government of India has introduced a new National Crop Insurance Scheme (NCIS) with two components "Modified National Agricultural Insurance Scheme" and "Weather Based Crop Insurance Scheme" from Rabi 2013-14 onwards by withdrawing the National Agricultural Insurance Scheme. Under the new Modified National Agricultural Insurance Scheme which is implemented in all districts from Rabi 2013-14, the premium payable by the farmers increases to 3.75 percent. With a view to encourage the farmers to adopt the agricultural crop insurance on a large scale so as to enable them to mitigate the crop losses and continue their agricultural operations in a sustainable manner, the State Government has made a strong plea to the Central Government to equally share the increased commitment on premium for the farmers over and above 2.0 percent of the sum insured.

4.10.6 Institutional Credit:

Timely availability of credit at reasonable rates especially to small and marginal farmers is crucial for agricultural growth. Public sector banks, co-operative banks and regional rural banks play an important role in meeting the entire crop loans needs in the State. Of the total credit disbursed by the above institutions, the share of the farm sector increased from 53.7 percent in 2011-12 to 60.3 percent in 2012-13. The quantum of crop loan disbursed in the State

by these institutions steadily increased from Rs. 34,432 crore in 2011-12 to Rs. 51,991 crore in 2012-13 (51.0%). It was planned to disburse crop loans to the tune of Rs. 48,657 crores in 2013-14. Of the total crop loan disbursed, paddy, plantation and horticulture crops together accounted for a sizable share of about 72.0 percent in both the years. During 2012-13 in respect of paddy, oil seeds, turmeric, sugarcane and plantation and horticulture crops the disbursement of crop credit exceeded the respective targets.

A meagre 4.0 percent of the total institutional credit for the farm sector had been utilized for infrastructure development viz., minor irrigation (Rs. 859 crore), land development

Crops	2011-12	2012-13		2013-14 (Target)
		Target	Achieve	
1. Crop Loan				
Paddy	8735	13456	15029	9602
Millets	32	152	20	209
Oil Seeds	3074	3859	5116	6649
Pulses	178	299	127	413
Cotton	413	601	405	763
Tobacco	87	39	5	46
Turmeric	2839	2745	3716	3786
Sugarcane	3047	4358	4529	5485
Horticulture crops*	16027	14323	23044	21704
Total	34432	39832	51991	48657
2. Total Farm Sector	37366	52326	58289	65647
Total Institutional credit	69553	91325	96661	115076
Note : * includes plantation				
Source: State Level Bankers' Committee, IOB, Chennai - 2				

(Rs.404 crore), farm mechanization (Rs.1,119 crore) and storage/market yard (Rs. 190 crore) in 2012-13.

Vast extent of agricultural lands is given on lease for small and marginal farmers/agricultural labourers due to migration of land owners, labour problems and other reasons. These tenant farmers are not able to secure credit from banks and have to depend on informal sources of credit for taking up cultivation. There is need for bringing them into banking fold and facilitate provision of credit for farming operations.

4.10.7 Agriculture Marketing:

Owing to a number of factors such as inadequate storage facilities, lack of quick and economical means of transportation, perishability of farm produce, poor withholding capacity of the farmers and urgent credit needs, the unorganized sector comprising wholesale merchants, commission agents and other intermediaries continue to dominate the sphere of

Commodities	2012-13	2013-14 *
Cereals	1670.50	653.24
Pulses	117.20	55.71
Other food crops	156.99	36.51
Others	162.97	124.89
Non food crops	1008.20	637.90
Total	3115.88	1508.27

*Note: * Upto Oct'2013*
Source: Department of Agricultural Marketing and Agri-business, Chennai-32.

agricultural marketing in the State. With the aim to create infrastructure and to regulate agricultural produce trade activities, the State Government enacted the Tamil Nadu Agricultural Marketing (Regulation) Act 1987 and Rules 1991 replacing the earlier Act of 1959. At present, 21 Marketing Committees are functioning at the district level. Under their control, 277 Regulated Markets are functioning in the State. Among them 66.0 percent transacted business of 5,000 metric tonnes per annum, 18.0 percent 2,000 to 5,000 mt of produce and 16.0 percent less than 2,000 mt per annum. The total number of licensed traders engaged in the transaction of agricultural produce in the regulated markets increased from 27,620 in 2011-12 to 28,253 in 2012-13. Due to the wide spread drought, the total quantum of agricultural produce transacted in the regulated markets fell from 18.97 lakh tonnes in 2011-12 to 17.43 lakh tonnes in 2012-13. With the prevailing favourable agricultural scenario in the State during 2013-14, it was programmed to transact 27.30 lakh tonnes. The total value of agricultural commodities transacted by these regulated markets during 2012-13 was Rs.3, 116 crore, of which food crops accounted for a major share of 68.0 percent and the remaining being non-food crops. Upto the end of October 2013, the total value of transactions stood at Rs. 1,508 crore.

Grading of agricultural commodities has three main purposes, namely, (a) to promote common trade language and avoid the need for physical checking and handling at many points; (b) to protect consumers by ensuring quality of product purchases; and (c) to protect the producer from exploitation by ensuring prices commensurate to the quality of produce. Total quantum of agricultural produce graded in the State increased from 2.59 lakh tonnes in 2011-12 to 3.0 lakh tonnes in 2012-13.

Market information is an important tool in the agricultural marketing system. 189 regulated markets upload prevailing agricultural produce price and arrivals on an electronic portal on a daily basis. Apart from this, 179 farmers' markets had also disseminated price details. To minimize the loss after harvest during drying, cleaning and winnowing, 1,359 village level drying yards were constructed at a total cost of Rs. 27.35 crore. Four Agri Export Zones were established in the PPP mode at Hosur, Ooty, Nilakottai and Panruti to facilitate value addition for agricultural products and to minimize post-harvest losses. It ensures steady and better price realization to the farming community as well as availability

of commodities in processed form to the consumers throughout the year. The total turnover of these zones during 2012-13 was Rs. 3.01 crore.

In the co-operative fold, 110 Primary Co-operative Marketing Societies transacted agricultural produce of a total value of Rs.552 crore in 2012-13. Up to October 2013, the total value of transaction was Rs. 163 crore. Of the total value of transaction cotton alone accounted for a sizable share of 44.0 percent.

Food and agricultural commodity prices are primarily determined by domestic demand and supply factors. Consequently, there is a wide gap between the prices received by the farmers and the prices paid by the consumer. At times, the farmers are not able to receive a price to cover the cost of production while the consumers are paying an abnormally high price for the same commodity. This is a major concern for the policy makers. High food inflation with an inadequate supply response, aggravated by logistics and market-related constraints are other areas requiring attention. Further, to provide a higher share of consumer prices to the farmers, there is a need to reduce the multiple layers of intermediaries by providing alternative marketing channels. Creation of scientific storages nearer to the farms is necessary so as to avoid wastage and produce deterioration. Enlarging the scope of provision of institutional credit to the farmers through various instruments like pledge financing, so that they are not compelled to sell the produce at distress price is also necessary. Supply of market information and extension services to advise farmers on marketing, capacity-building in marketing; development of marketing linkages between farmers, agribusinesses and large retailers may be developed through cooperatives, contract farming or associations of stakeholders representing different interest groups like farmers, input suppliers, agricultural produce processors, etc.

Table No. 4.22 Value of Agricultural Produce sold by Marketing Co-operative Societies (Rs. Crores)		
Commodities	2012-13	2013-14 (upto Oct 2013)
Foodgrains	20.14	3.35
Cotton	241.95	30.01
Spices	91.19	17.75
Oilseeds	73.78	11.34
Chillies	4.49	0.74
Others	120.35	99.40
Total	551.90	162.59
Source: Registrar of Co-operative Marketing, Chennai - 10.		

4.11. Highlights of Major Schemes Implemented in the State:

The State has taken all efforts to increase agricultural production, enhance productivity and explore the untapped potential. The Central Government also supplements the efforts of the State through implementation of Centrally Sponsored and Central Sector Schemes.

Development of wasteland/degraded land and improving rainfed farming is crucial towards attaining self sufficiency in crop production. Towards achieving this goal, various area and location specific programmes viz., Drought Prone Area Programme (DPAP), Integrated Wasteland Development Programme (IWDP), Integrated Watershed Management Programme (IWMP), National Watershed Development Project for Rainfed Areas (NWDPR) are being implemented in the State over a period of time on watershed basis with the participatory approach. During 2012-13, the total area treated under these programmes was 1.47 lakh hectares at a cost of Rs. 186.13 crores.

With a view to improve the yield rate and production of rice, System of Rice Intensification (SRI) is being implemented in the State. During 2012-13, it had adopted the whole village concept in 1,719 villages covering an area of 1.68 lakh hectares. During 2013-14, the scheme would be implemented in 2,000 villages covering an area of 1.90 lakh hectares.

To enhance the production of rice and pulses on mission mode approach, the National Food Security Mission (NFSM) is implemented since 2007-08. Under the scheme Rs.22.87 crores was spent during 2012-13 towards promotion of rice in five districts viz., Thiruvarur, Nagapattinam, Sivagangai, Pudukkottai and Ramanathapuram. Under this programme, it was contemplated to improve pulses production in all districts except Chennai and The Nilgiris. Various activities were taken up at a cost of Rs. 14.76 crores.

With the aim to increase productivity of oilseeds, pulses, oil palm and maize, the Integrated Scheme for Oilseeds, Pulses, Oil palm and Maize (ISOPOM) is implemented since 2004-05 with region specific strategies. From 2010-11 onwards, since pulses have been integrated with the NFSM, ISOPOM scheme was implemented only for oilseeds, oil palm and maize at a cost of Rs.18.51 crores during 2012-13.

Under National Mission on Micro Irrigation, instillation of sprinkler irrigation for sugarcane, cotton, maize, pulses, groundnut and horticultural crops is taken up. During 2012-13 this scheme has been implemented by Tamil Nadu Horticulture Development Agency (TANHODA) at a cost of Rs. 135.34 crores benefiting an area of 26,538 hectares. It has been proposed to cover 47,800 hectare at an outlay of Rs. 372.84 crores in 2013-14. Under the World Bank aided programme IAMWARM, crop demonstration, distribution of agricultural implements, farmers training and capacity building are being taken up at an outlay of Rs. 98.00 crore. The total expenditure incurred upto 2012-13 was Rs. 81.27 crores.

With the success in achieving an increase of 30 – 50 percent in productivity due to adoption of high yielding/hybrid seeds, micro irrigation and fertigation in vegetables, turmeric, banana, precision farming is successfully implemented from 2008 onwards. During 2012-13, at 50 percent subsidy, it was implemented at a cost of Rs. 9.25 crore benefiting 4,961 hectares.

For promotion of horticulture in rainfed area, Rainfed Area Development Programme (RADP) was implemented in 2,655 acres at a cost of Rs. 8.79 crores during 2012-13.

Towards augmenting mechanization in agriculture under National Agricultural Development Programme (NADP) subsidy assistance to individual farmers for purchasing agricultural machinery so as to take up timely sowing, transplanting, weeding, plant protection and harvesting and to overcome the acute farm workers scarcity during 2012-13 total subsidy assistance of Rs. 73.45 crore was provided to the farmers for purchasing 41,328 machineries for agriculture purposes.

4.12. A Way Forward:

To meet the growing demand for agricultural produce and to ensure food security, the following measures are proposed:-

- For achieving a farm output growth of 5 percent, incremental productivity gains and technology diffusion are imperative.
- Agriculture growth targeted in the Five Year Plans has often not been achieved due to high degree of uncertainty of the monsoon. In this context, dry land farming, crop diversification and conservation of water through precision farming and waste land development are indispensable.
- For nutritional security, special thrust is required for higher production and productivity level in pulses, oilseeds and fruits and vegetables.
- Sufficient public sector investment in agriculture sector is central to agricultural planning.

- Ground water is still perceived as individual property and is exploited inequitably and without any consideration to sustainability. It leads to over exploitation. This needs to be properly regulated.
- Existing resource infrastructure is not being properly maintained resulting in under utilization of available resources. Maintenance of existing water bodies may be assigned top most priority. Local bodies as well as stakeholders should be involved in the process.
- Encroachment and diversion of water bodies must not be allowed and wherever it has taken place it should be restored to the extent feasible.
- Water Users Associations should be given statutory power to collect and retain a portion of water charges and maintain the distribution system in their jurisdiction.
- A higher proportion of farmers rely on farm-saved seeds leading to low seed replacement rate. It is desirable to achieve the required and recommended seed replacement rate to accomplish higher production and productivity.
- There is skewness in the application of chemical fertilizers (NPK). There is overdose of nitrogenous and limited doses of phosphoric and potash fertilizers application. Farmers are to be educated enough to apply balanced application of fertilizers. It required appropriate price incentives.
- Cost-effective and productivity-enhancing System of Rice Intensification is to be implemented with efficacy and pragmatism.
- Reforms in extension services are needed to ensure smooth transfer of agriculture technology and information to the farming communities.
- Exhaustion of yield potential of high yielding varieties in rice is to be overcome.
- Post harvest value addition is to be improved and upgraded with adequate public investment.
- Efficient markets with a dynamic supply chain is indispensable for the development of the agricultural sector.
- With respect to horticulture, marketing initiatives are to be taken to promote modern terminal markets for fruits, vegetable and other perishables in the important urban centres. The terminal markets will operate on a hub-and-spoke format wherein the terminal markets are linked to a number of collection centres located in key production centres to allow easy access to farmers for marketing of their produce.
- There are wide yield gaps across the State. Agriculture production can be substantially increased if the yield gap will be addressed properly through technological and policy intervention.
- Awareness on crop insurance among the farmers may be enhanced.

Strategies of Tamil Nadu Vision 2023

The Tamil Nadu Vision 2023 has a three pronged strategies for improving productivity and thereby sustaining growth in agriculture production so as to meet the growing demand for the agricultural produce and as well as ensuring food security. The Strategies are:

- *Improving productivity by introducing scientific agricultural methods and building an institutional network to support the continued adoption of the same.*
- *Ensuring timely irrigation by intelligent use of available water by adopting effective recharging mechanisms, drip/sprinkler irrigation systems, timely cleaning and deepening of tanks and canals, and adopting appropriate cropping pattern based on water availability.*
- *Developing suitable post harvest infrastructure to maximize the benefits of value addition and timely marketing of produce. The State will also extend agricultural extension activities to cover the entire farming community.*

Source: Vision Tamil Nadu 2023, Government of Tamil Nadu, (Page No.24)

To sum up, agriculture development is predicated by improvement in farm production and productivity, better utilization of agriculture inputs, proper marketing infrastructure and support, stepping up of investment in agriculture with due regard and environmental concerns and efficient food management.