Sl. No	Agro Climatic Zones	Districts Covered	Soil Type	Rain fall (mm)
3	Western Zone	Erode, Coimbatore, Tirupur, Theni, Karur (Part), Namakkal (Part), Dindigul, Perambalur and Ariyalur (Part)	Red loam, black	715
4	Cauvery Delta Zone	Thanjavur, Nagapattinam, Tiruvarur,Tiruchirapalli,and parts of Karur, Ariyalur, Pudukkottai and Cuddalore	Red loam (new delta), alluvium (old delta)	984
5	Southern Zone	Madurai, Pudukkottai Sivagangai, Ramanathapuram, Virudhunagar, Tirunelveli and Thoothukudi	Coastal alluvium, black, red sandy soil, deep red soil.	857
6	High Rainfall Zone	Kanyakumari	Saline coastal alluvium, deep red loam.	1,420
7	Hilly Zone	The Nilgiris and Dindigul (Kodaikanal)	Laterite	2,124

1. AGRICULTURE

1. Introduction

Agriculture, being a source of both livelihood and food security for a vast majority of our society, needs a higher priority to achieve inclusive growth. Agriculture is the key to poverty alleviation which contributes significantly to the GDP together with its allied sectors. Hence, it would be more meaningful to focus agriculture as a holistic and integrated value chain from farmer to consumer rather than farming alone.

The widening population day by day has created lot of pressure on agriculture by increasing the food demand, increasing the fragmentation of land holdings, decreasing the availability of cultivable land area and dwindling ground water resources. Vagaries of monsoon have necessitated formulation of a strategic vision for agriculture which encompasses factors such as conservation of land, water, soil and other biological resources, timely and adequate availability of inputs at needy places, development of innovative labour-saving technologies, farm mechanization, increase in the flow of sufficient credit particularly to the small and marginal farmers, support for creation of marketing infrastructure and value chain management.

In the circumstances, the Government's systematic approach to transform agriculture into a more profitable crop production intensification system by converging all subsectors of agriculture and revitalization of the extension mechanism have made the farmers more responsive and receptive in adopting all the technological innovations and latest developments thus paving way for increased food grain production of the State.

Government of Tamil Nadu have been conferred with national awards at various points of time for its creditable performance in increasing the food grain production of the state. The state bagged the **Krishi Karman Award of Government of India for achieving highest ever production of 101.52 L.MT during 2011-12. The State also received the "State Agriculture Leadership Award 2013"** from the leading magazine, Agriculture Today for various new initiatives taken by the Government.

To emulate this feat of achievement, Government of Tamil Nadu has scaled up the initiatives such as System of Rice intensification, System of Pulses intensification, promotion of transplanted red gram, intensification of millets, sustainable sugarcane initiatives, precision farming, micro irrigation during **2013-14** besides special efforts to extend assistance under **Kuruvai special package** for increasing the coverage during Kuruvai season in Cauvery delta districts, bring fallow lands under cultivation, increase the area under rice fallow pulses and food grains during summer, implement food grain mission, Integrated Farming System under district saturation model, Invigorate Extension system through efficient use of ICT tools to step up agricultural production and improve the economic status of the farming community.

2. Season

2.1. Rainfall

The season wise rainfall received during 2012, 2013 and 2014 are as follows:-

(in mm)

Season	2012			2013			2014		
	Nor -mal	Actual	Dev (%)	Nor -mal	Actual	Dev (%)	Nor -mal	Actual	Dev (%)
Winter Season (Jan–Feb)	31.30	9.50	(-)70	30.70	34.40	(+)12	31.40	13.80	(-)56
Summer season (Mar-May)	128.00	86.20	(-)33	128.00	92.20	(-)28	128.00	157.20	(+)23
South West Monsoon (June–Sep)	321.30	245.90	(-)24	321.10	325.40	(+)1	78.90 (*)	82.20 (*)	(+)4
North East Monsoon (Oct–Dec)	440.40	370.50	(-)16	440.40	294.30	(-)33			
Total	**921.00**	**712.10**	(-)**23**	**920.20**	**746.30**	(-)**19**			

(*) Up to 16.07.2014

The state received normal rainfall during winter & South West Monsoon and deficit rains during summer & North East Monsoon period during 2013. Compared to 2012, the rainfall received during North East Monsoon is deficient with wide variation in spatial and temporal distribution which has affected the prospects of various crops. The rainfall received during winter and summer seasons of 2014 is deficient and excess respectively. So far, the state has received normal rainfall during South West Monsoon.

2.2. Crop Status in Delta districts

The onset of South West and North East Monsoons, release of Cauvery water by Karnataka, sufficient storage and opening of Mettur reservoir influence paddy cultivation in canal irrigated delta areas of about 0.90 L.Ha (2.25 L.Ac),

whereas an area of about 0.40 L.Ha (1.0 L.Ac) is under filter point bore well irrigated area.

During **2011-12**, the water storage in Mettur reservoir was quite comfortable and Government ordered to **open** the **Mettur dam on 6th June, 2011**, as against the scheduled date of 12th June, which is the first time in history since Independence due to which Kuruvai cultivation was taken up well in advance in an area of 1.367 L.Ha (**3.418 L.Ac)** which is over and above the normal area.

In the next two years, one or the other factors played truant in the destiny of the farmers due to which the cultivation prospects were affected. During **2012-13**, the timely intervention of the **Hon'ble Chief Minister** in extending **12 hrs three phase power supply** for raising Kuruvai to the farmers in delta areas besides announcement of **Samba Special Package** for an amount of Rs.137.98 Crores for Thanjavur, Nagapattinam, Tiruvarur and parts of Cuddalore and Trichy districts had a major impact on samba cultivation. An area of 4.613 L.Ha (11.533 L.Ac) was covered during samba with an **additional coverage of 0.831 L.Ha (2.078 L.Ac)** compared to the normal area of 3.782 L.Ha (9.455 L.Ac).

An amount of Rs.68.10 Crores was allotted for distribution of critical inputs and organising community nursery to motivate the farmers to take up samba paddy cultivation in a larger area , Rs.39.88 Crores towards provision of diesel subsidy, water carrying pipes & mini portable sprinklers, spraying of Pink Pigmented Facultative Methylotrophs (PPFM) using Multi-purpose boom sprayers for protection of Samba/ Thaladi crop from withering and Rs.30 Crores exclusively for payment of farmers' share of premium cost for universal coverage under Crop Insurance.

2.2.1. Kuruvai paddy crop 2013-2014

The Mettur dam was opened belatedly on 2.8.2013 due to poor storage and non-release of water by Karnataka Government. Inorder to motivate the Delta farmers to take up paddy cultivation utilizing the available ground water near the filter points, **Hon'ble Chief Minister** announced to provide **12 hrs three phase power supply** followed by **Kuruvai Special package** in Delta Districts viz.,Thanjavur, Nagapattinam, Tiruvarur and parts of Cuddalore, Ariyalur and Trichy that motivated the farmers to take up paddy cultivation in an area of **0.816 L.Ha** (**2.040 L.Ac**)utilizing the available ground water near the filter points. The farmers were supplied with biopesticides , Micro Nutrient Mixture, Bio-fertilizer, Gypsum and HDPE pipes at free of cost at an outlay of **Rs.18 crores**.

2.2.2. Kuruvai paddy crop 2014-2015

Uncertainity in the onset of South West Monsoon, inadequate rainfall in the catchment areas, change in the rainfall pattern due to El Nino influence the opening of Mettur reservoir. Hence, the **Hon'ble Chief Minister** has announced a package for Rs.32.95 Crores consisting of distribution of conveyance pipes to increase water use efficiency, productivity enhancement inputs, unique concept of raising community nursery of short duration/ extra short duration paddy varieties to be transplanted under System of Rice Intensification (SRI) with provision of Paddy transplanters and power weeders to farmers' groups to encourage mechanization. A contingency plan to maximixe the Kuruvai coverage has also been drawn depending on the time of release of water from the Mettur Dam.

3. Area, Production and Productivity:

During 2012-13, an acute rainfall deficiency coupled with terminal drought caused large scale crop damage. The Government declared the entire state except Chennai as drought affected. The estimate of area, production and productivity for 2012-13 is as follows

Crop	Area (L.Ha.)		Production (L.MT)		Productivity (kg/Ha)	
	Target	Achmt (*)	Target	Achmt (*)	Target	Achmt (*)
Rice	22.00	14.93	86.50	40.50	3932	2713
Millets	11.00	6.42	26.95	13.42	2450	2090
Pulses	10.40	5.11	6.55	2.13	630	417
Total food grains	**43.40**	**26.46**	**120.00**	**56.05**		
Oilseeds	6.60	3.90	15.00	8.16	2273	2092
Cotton (L.Bales)	1.55	1.33	4.20	2.55	461	326
Sugarcane (MT)	3.60	3.48	493.50	340.14	137	98
Total	**55.15**	**35.17**				

(*) Final estimate 2012-2013

Popularisation of crop specific agricultural practices such as SRI, System of Pulses intensification(SPI), intensification of millets and red gram (through transplantation), Sustainable Sugarcane Initiatives(SSI), precision farming, micro irrigation, integrated farming system besides efforts such as distribution of Farmers integrated hand book, effective dissemination of good practices to farmers through Uzhavar Peruvizha and development of suitable crop plan at farm level through Farm Crop Management System have made a significant impact in salvaging the production of food grains during 2012-13.

The year **2013-14** which opened on a positive note with good rainfall during winter season was subsequently affected due to poor storage of reservoirs, delayed opening of Mettur dam, skewed distribution of rainfall during South West Monsoon inspite being Normal as per IMD norms resulting in failure of achieving the programmed area during Kharif 2013 besides affecting the prospects of Kuruvai paddy crop in Delta districts. Further deficient rainfall in North East Monsoon had a major impact on the crop coverage especially in southern districts. However, Government took up series of initiatives such as implementation of Kuruvai Special package 2013, bringing back fallow lands for cultivation, rejuvenating soil health, Launching of food grain mission to bring paradigm change from "food security to food surplus", adoption of SRI and SPI as a whole village concept in newly identified villages, promotion of transplanted red gram cultivation in a larger extent coupled with micro irrigation, cultivation of Rice fallow Pulses with improved practices, intensification of millets cultivation, SSI, precision farming, micro irrigation, integrated farming system as a district saturation model and Invigorating Extension System through efficient use of ICT tools to increase the area, production and productivity of all crops during 2013–14.

Despite poor rains during 2013-14, various path breaking initiatives by the Government has resulted in an all time high estimated production of food grains. The area, production and productivity as per **fourth advance estimate is given below.**

Crop	Area (L.Ha.)		Production (L.MT)		Productivity (kg/Ha)	
	Target	Achmt (*)	Target	Achmt (*)	Target	Achmt (*)
Rice	20.00	17.86	78.50	69.62	3925	3898
Millets	11.00	9.81	26.95	35.96	2450	3666
Pulses	10.40	8.80	6.55	5.07	630	576
Total food grains	**41.40**	**36.47**	**112.00**	**110.65**		
Oilseeds	6.60	4.22	15.00	10.52	2273	2493
Cotton (L.Bales)	1.55	1.52	4.20	4.08	461	456
Sugarcane (MT)	3.60	3.27	396.00	317.60	110	97
Total	**53.15**	**45.48**				

(*) Fourth Advance Estimate 2013-14

3.1. Milestone achievements in three years:

The Government launched crop and site specific strategies propelled by farm level interventions for the terminal year of XI Five Year Plan and also for XII Five Year Plan to accelerate growth in Agriculture sector and to usher in **Second Green Revolution** to increase the production and productivity of major crops and a host of welfare schemes were introduced and implemented in the last three years.

- **Uzhavar peruvizha, an Intensive multidisciplinary awareness campaign** launched by **Hon'ble Chief Minister** in 2012-13 involving Agriculture, Allied and Line Departments was conducted in all the revenue villages of all 385 blocks and was continued during 2013-14. The mass campaign helped in bridging the knowledge gap of the farming community at revenue village level besides enabling the Department to collect 18.35 Lakh soil samples, distribute 9.35 Lakh Farmers Integrated Hand books, suggest 6.67 Lakh crop plans & provide inputs worth Rs.37.99 Crores. About 80.86 Lakh farmers participated and an amount of Rs.78.48 Crores was spent.

- **Farm Based Interventions** were introduced during 2011-12 to bridge the yield gap at farm and village level. **Hon'ble Chief Minister** launched series of new initiatives such as **Farm Crop Management System (FCMS), Farmers Integrated Handbook, Touch Screen Kiosks** and a number of new software modules for effective individual farm planning, management of inputs and speedy transfer of extension activities under AGRISNET platform fully exploiting the power of information technology in Agriculture**.**
- **SRI** & **SPI** were adopted as a **whole village concept** from 2011-12 onwards.
  - In the past three years, about **5,880 villages** were brought under **SRI** covering an area of 5.675 L.Ha This technology has increased the productivity of rice and in the last 10 years, the highest productivity of 3,918 kg/ha was obtained during 2011-12.
  - To bridge the production - demand gap in pulses, improved pulses production technologies with more focus on application of **Pulse Wonder** were advocated in **5,102 Pulses villages** covering an area of 3 L.Ha.
- **As a part of massive farm mechanization to ensure timely farming activities, Farm machineries** (Power tillers) were distributed **free of cost** for development of **SC & ST farmer group** with preference to the youth in 385 blocks at a cost of Rs.4.29 Crores.

- For the first time, the State Government sanctioned a sum of Rs.10.48 Crores during 2011-12 towards **Micro irrigation exclusively for pulses** in an area of 5,000 Ha. out of which, a sum of Rs.10.25 Crores was spent covering an area of 4,931 hectares. Judicious use of water combined with the use of DAP spray and pulse wonder increased the productivity of pulses by 44% (554 kg/Ha) during 2011-12, when compared to 2010-11.
- An innovative concept viz., **Intensive Redgram cultivation through transplantation** was taken up in 69,891 Ha. across the state at a cost of Rs.29.46 Crores to organize free demonstrations, provide inputs with subsidy and grant production incentives so as to increase the production of redgram. During 2013-14, this technology was **coupled with micro irrigation** in an area of 3,857 Ha. had increased the area of pulses to 8.80 L.Ha which is the **highest in the past decade**. Inspite of the water stress condition, an appreciable productivity of 576 kg / Ha was obtained.
- Promotion of high end technologies such as **Precision Farming and micro irrigation**, contributed to increase in production of pulses, millets, cotton and sugarcane through increased yield, quality and input use efficiency.
  - In the past three years, precision farming was taken up in 6,100 Ha. of agricultural crops at a cost of Rs.15.90 Crores.
  - Micro irrigation was adopted in an area of 31,822 Ha. for which an amount of Rs.123.07 Crores was spent.
- **SSI,** an exclusive comprehensive technology package for increasing the productivity of sugarcane was adopted in an area of 13,522 Ha. in the last three years at a cost of Rs.41.07 Crores. Tamil Nadu stands second at all India level in productivity.

- **1,182 Integrated Farming System models** were organized for wet land, garden land and dry land @ 1 model per block at a cost of Rs.8.84 Crores.
- As a part of bringing a rapid transformation in agriculture by encouraging farmers in adoption of innovative technologies, a **cash prize of Rs.5 Lakhs** and **a medal** worth of Rs.**3,500/-** are being given by the **Hon'ble Chief Minister** on the Republic Day function from 2011-12 onwards to the farmer who obtains the highest yield in paddy by adopting SRI technology.
- Government to ensure food security in the state recognized the efforts of the farmers who had contributed significantly for increasing the productivity of food grains by rewarding them with special awards for which an amount of Rs.**6.05 Lakhs** was spent.
- During **2013-14**, in spite of monsoon aberrations and erratic rainfall, efforts were taken by the Government to expand the area and production of food grains by bringing **additional area during summer** using the available water resources for which an amount of **Rs.18 Crores** was spent.

All these initiatives culminated in increased food grain production. The results were overwhelming in the first year itself as the state which is surging ahead in all fronts, obtained the highest food grain production of 101.52 L.MT during 2011-12. Though severe drought prevailed across the State during 2012-13, a food grain production of 56.05 L.MT was attained due to the special efforts taken by the Government. Inspite of deficit rains that continued during **2013-14,** sincere efforts of the Government have resulted in a food grain production of **110.65 L.MT** as estimated by the

Department of Economics and Statistics, which is unprecedented in the annals of agriculture in Tamil Nadu. This has instilled confidence to aim for a production of 145 L.MT of food grains during 2014-15.

Area and Production Programme for 2014-2015

Crop	Area (L.Ha)	Production (L.MT)	Productivity (Kg/ha)
Rice	21.00	92.00	4381
Millets	12.00	45.00	3750
Pulses	11.00	8.00	727
Total food grains	**44.00**	**145.00**	
Oilseeds	6.60	15.00	2273
Cotton (L.Bales)	1.70	6.70	670
Sugarcane (MT)	3.60	400.00	111
Total	**55.90**		

4. Big Leap towards profitable agriculture:

In pursuance of achieving ambitious goals of second green revolution, the Government is initiating various innovative strategies such as **"Planning to weather proof Food grain area"** for various monsoon scenario, Crop diversification, integrated approach to enrich the soil fertility, Effective water resources management, Increasing the Water Use Efficiency through promotion of precision farming, Micro Irrigation and crop specific technologies, input supply management, farm based interventions, whole village concept for paddy and pulses to develop model villages, SSI, group extension approach by invigorating the extension system, Integrated Farming System approach, weather, crop and market advisories to farmers, IT based farm level interventions & Capacity building for excellence, Formation of commodity groups, Farmers Producer Organisations (FPOs), imparting knowledge on cleaning, grading and value addition, linking them with aggregators

and meticulously executing these approaches under various crop oriented schemes for market led agriculture.

The Government has framed the following strategies for 2014-15 to intensify the cropping area and production:

- **Improving Land Resources**
  - Appropriate agro-ecologic zoning
  - Designing profitable cropping pattern
  - Increasing the gross cropped area and cropping intensity
  - Stabilize / enhance production in rainfed and dry land farming systems
  - Identification and bringing back fallow land under cultivation.
- **Nutrient Conservation and farm soil preservation**
  - Soil survey and land use
  - GIS based soil mapping to economise fertilizer use
  - Reclamation of problem soils
  - Site specific and need based nutrient management
  - Organic farming
- **Judicious utilisation of Water Resources for crop intensification**
  - Crop specific technologies in irrigation management to increase water use efficiency
  - Increasing irrigation intensity
  - Augmenting water harvesting resources such as farm ponds, percolation ponds, check dams, subsurface dykes, etc.,
- **Integrated Resource Management**
  - Strengthening input delivery system
  - Farming system and crop based technological interventions
  - Integration of livestock, horticulture, silvi-pastures, fisheries, sericulture, apiary etc., with crop husbandry

  - Grower clusters for a cohesive and multifaceted approach for optimal use of resources.
- **Agriculture Infrastructure Management**
  - Identifying farmers' vital needs, developing and maintaining rural infrastructure by teaming up the local communities, farmers and traders.
  - Rebuilding agriculture infrastructure for seed production, storage & processing, production of other inputs such as biofertilizers, biopesticides etc., quality control of all inputs, capacity building besides transfer of technologies.
  - Encouraging private investments in farm development.
  - Deriving maximum efficiency in the use of key inputs including water, nutrients, bio-pesticides, energy, land and labour.
- **Alternative Energy sources to increase farm efficiency**
  - Tapping solar energy to increase the farm output
  - Drudgery, time & labour saving technologies - Farm mechanization
- **Invigorating the Agricultural Extension machinery**
  - Perk up the Extension delivery system
  - Establishment of Knowledge and Training centres
  - IT based Extension deliverance
- **Human Resource Management**
  - Entrepreneurship development
  - Capacity building for excellence
  - Instituting Awards and rewards
- **Calamity Relief**
  - Mitigating crop loss due to climatic stress and establishing a resilient cropping system
  - Crop Insurance

The Way Forward

- ❖ Intensifying the net cultivable area
- ❖ Revitalizing soil health to increase farm productivity
- ❖ Promoting more rational and efficient conjunctive use of irrigation water
- ❖ Precise Input Supply System which serves as a network of production technologies and management strategies to improve the delivery mechanism
- ❖ Increasing the total efficiency of the inputs to increase the agricultural output
- ❖ Improving the Farmers Development Index
- ❖ Creation of robust Agriculture Infrastructure Network besides capacity augmentation by retrofitting the existing ones
- ❖ Maximizing the production potential of rainfed areas in all agroclimatic zones

Strategic Action plan to achieve the Goal

- Block wise plan of action for 3 types of scenario viz., normal, deficit and excess rainfall has been chalked out as **Weather proofing for food grain production**.
- A **comprehensive Seed action plan** has been developed for the different scenario.
- Making available sufficient 'C' seeds by developing three year seed rolling plan involving TNAU for new varieties with short duration, abiotic and biotic stress tolerance, less nutrient uptake and market preference in time.
- **A Village level Soil mapping booklet and soil fertility based Nutrient Management matrix** indicating village wise, crop wise nutrient application to improve the soil organic matter and soil health will be developed for attaining potential yield.

- Action has been initiated to **strengthen infrastructure** for soil testing, production of MN mixture, bio-fertilizers, liquid bio-fertilizers and bio-control agents.
- The **Extension System** is being **invigorated** to become farmer oriented with fixed Village visit schedule and close interaction with grower clusters.

The Government of Tamil Nadu is pioneer in planning, designing and implementing several unique initiatives under State Sponsored Schemes, Centre-State Shared Schemes, Centrally Sponsored Schemes and Externally Aided Projects to meet the demands of farming community and for a holistic development of the State Agriculture. The Government which is promoting eco-friendly and profit oriented agriculture without compromising with its traditional aspects, is developing novel projects every year for soil health management, crop improvement and management of food grains, oilseeds, cotton and sugarcane, crop protection, crop insurance etc., which have created a huge positive spin-off benefits.

4.1. Improving Land resources

Appropriate Land Resources planning and management should facilitate allocation of land to the uses that meet out the demands of the burgeoning population besides providing the greatest sustainable benefits to the farmers. Government is in the process of improving land utilization based on Agro Ecological Zoning for which the major crops in each agro-ecological zone will be identified and the details on cultivation practices, productivity, marketing, post harvest etc will be collected and analyzed. Crop workshops will be organized with the participation of department officials, scientists, experts and progressive farmers to arrive at the best management practices for increasing the production potential of each crop,

recommend suitable cropping pattern for effective use of natural resources and suggest appropriate post harvest technologies for each crop.

Government encourages the smallholders to adopt sustainable crop production intensification by recommending suitable and profitable cropping system, reclamation of problem soils, identification and conversion of fallow lands for agriculture, increasing the productivity of agricultural lands by village-based Integrated Nutrient Management through stratified soil sampling and analysis, promotion of organic farming, Integrated Farming, diversified farming, Rainfed Area Development and appropriate market linkages.

NABCONS, a consultancy agency under NABARD has been assigned with the task of preparing a Detailed Project Report for Integrated Farming system for Villupuram district on district saturation model.

An extent of 100 acres of fallow lands has been brought back to cultivation at a cost of Rs.5.60 Lakhs during 2013-14 through land development measures, creation of irrigation structures and input distribution.

Government with an aim to stabilize and enhance the production in dry land and rainfed areas implemented Rainfed Area Development Programme under National Agriculture Development Programme at a cost of Rs.9.95 crores for organizing cropping system based demonstrations, establishment of vermicompost units, in-situ moisture conservation and post harvest management. The scheme will be continued under National Mission on Sustainable Agriculture during 2014-15.

4.2. Nutrient Conservation and farm soil preservation

Soil degradation is one of the biggest challenges in increasing the farm productivity. Hence agriculture must be brought back to its roots by emphasizing on the importance of soil health through natural sources of plant nutrition and judicious use of mineral fertilizers.

Government is giving thrust to retrieve and preserve soil health through detailed soil survey, reclamation of problem soils, soil sample collection and analysis, GIS based soil mapping, Site and crop specific need based nutrient management through **Farmers Integrated Handbook (FIHB) ,** increasing soil organic matter in soils and biological nitrogen fixation to enrich N-poor soils and correcting micro nutrient deficiencies.

4.2.1.Soil survey and Land use organization

Soil survey & **soil mapping** is the process of classifying soil types and other soil properties in a given area and geo-encoding such information. This information is very useful in identifying the land suitability and risks of land use for sustainable and profitable use of soil and land resources. Government in order to develop appropriate land use planning has completed Reconnaissance soil survey at taluk level and detailed soil survey at village level to demarcate the area into soil order & series, study the characteristics of the soil, nutrient status, Land irrigability, Land capability, Crop suitability etc. is being carried out. As per the Internationally recognized system of United States Department of Agriculture (USDA), the soil is classified, extent is mapped on standard topographic base maps and interpreted to develop a more suitable cropping system at farm level by formulating appropriate technologies to increase the farm productivity. Comprehensive inventory on soil resources is prepared by conducting detailed soil survey

through four Soil Survey Units at Coimbatore, Thanjavur, Vellore and Tirunelveli. The detailed soil survey will be taken up in an area of 0.99 L.Ha during 2014-15.

4.2.2. Soil Nutrition-care

Soil degradation which is one of the biggest challenges in agriculture is caused due to erosion, nutrient imbalance, compaction, salinization, water-logging, decline in soil bio-diversity, urbanization, contamination with heavy metals & pesticides and adverse impact of climate changes resulting in loss of organic matter (declined to 0.45% in 2010-11 from 1.26% in 1980s) and multi-nutrient deficiencies.

Government to manoeuvre this, has taken up series of initiatives such as conservation agriculture, integrated nutrient management, erosion control, saline and alkaline soil management, development of remote sensing and Global Positioning System (GPS) - based Decision Support System (DSS) and amelioration of polluted soil for soil health management which is fundamental for food, water and environmental security.

The deterioration in soil organic content has created a serious concern which has necessitated to revisit the policy of organic farming for which Government is taking slew of measures to build up the organic matter in the soil.

- **Farmers Integrated Hand book** has been distributed on fast track approach to 45.62 lakh farm holdings after detailed soil sampling and analysis in a period of three years by expending an amount of Rs.10 crores. During 2014-15, 35.56 lakh FIHB will be distributed.
- During 2013-14, **GIS soil mapping** was done on pilot basis in 6 blocks of selected 6 districts to identify soil properties and nutrient removal pattern of crops based on which recommendations will be provided to restore

the soil health and reduce the cultivation expenses**.** During 2014-15 & 2015-16, it is programmed to complete the GIS soil mapping for 16,732 revenue villages in Tamil Nadu at a financial outlay of Rs.7.76 crores under National Mission on Sustainable Agriculture (NMSA).

- 30 Soil Testing Laboratories functioning in the state have been modernized by providing IT infrastructure besides recruiting JRF to expedite the soil analytical works. The soil sample results of all the farm holdings are being uploaded in the **AGRISNET,** the web portal of Agriculture Department. During 2014-15, it is programmed to analyse 8.382 Lakh samples.
- 16 Mobile Soil Testing Laboratories have been provided with fully equipped mobile vans to provide service at farmers' doorstep for spot analysis of soil macro & micronutrient status and also advice on the cropping system to be adopted. During 2014-15, it is programmed to analyse 2.88 Lakh samples.
  - Government with an aim to expedite soil sample analysis with more precision and accuracy will **strengthen the soil testing and mobile soil testing laboratories.**
- The Central Control Laboratory located at Kudumianmalai, is the Apex Organization which serves as a watchdog on quality parameters, precision and accuracy of analysis in the laboratories besides providing widespread awareness on soil-test–based fertiliser use and technical competence through training to the laboratory personnel.
- Government with an objective of improving the soil productivity, increasing the profitability of farmers and achieving agricultural development by preserving soil fertility on a sustainable eco-friendly basis is promoting

Organic farming for which schemes such as procurement & distribution of green manure seeds, production and distribution of Bio-Fertilizers, composting of farm wastes with *Pleurotus and* Vermicomposting of farm wastes are being implemented. Further, efforts will be taken to promote efficient manure management and biological nitrogen harvesting as a whole village concept.

- **Green manure crops** like Sun hemp, Daincha, Kolinji and Sesbania are cheap alternative to inorganic fertilizers that maintain / increase soil organic matter content, improve soil fertility, increase yield, quality of produce & economic returns. During 2013-14, 207 MT of Green Manure Seeds were procured and distributed to the farmers at a subsidy of 50%. The scheme will be taken up during 2014-15 also. Focus will be on developing revenue generating models for Green manure production.
- **Bio-fertilizer**, a cost effective, eco-friendly, organic input, renewable source of plant nutrients and a vital component in Integrated Nutrient Management is produced in three strains viz., *Azospirillum, Rhizobium and Phosphobacteria* in the Government owned 15 **Bio-Fertilizer Production Units** functioning with an annual production capacity of 3,850 MT (192.50 Lakh packets of 200 gram each) and distributed at a cost of Rs.6/-per packet. The government has programmed to produce and supply 2,500 MT during 2014-15.
  - During 2014-15, it is programmed to produce **new biofertilizers** which solubilize Potash and Zinc content in the soil for which all the 15 units will be upgraded at a cost of Rs.5.55 Crores under National Agriculture Development Programme(NADP).

They are tested for their standards at the Bio-fertilizer Quality Control Laboratory functioning at Tiruchirapalli and this laboratory will be strengthened under NMSA during 2014-15 to improve the efficiency.

- As announced by the Government during 2012-13, the 5 existing Bio-Fertilizer Production Units(BFPUs) have been strengthened for production of **liquid biofertilizers** and production has commenced. During 2014-15, it is programmed to produce 2.5 L.litres of liquid bio fertilisers. Further, the remaining BFPUs will be strengthened during 2014-15.

- Annually 525 MT of **Blue Green Algae** and 500 MT of **Azolla** are produced and distributed to the farmers as they act as desirable biological fertilizers that reduce the use of chemical fertilizers by 25%. This scheme will be continued during 2014-15 also.
- Kits containing 1 Kg of *Pleurotus*, 5 Kg of Urea and pamphlet are distributed every year to the farmers at free of cost to produce **compost from farm waste using *Pleurotus*.**
- **Vermicomposting of agricultural waste** which is advantageous in improving soil structure, texture, aeration & water holding capacity, increasing the beneficial micro flora and improving the quality and shelf life of the produce is demonstrated to the farmers in their own fields.
  - During 2013-14, 250 demonstrations cum training to benefit 12,500 farmers were organized at a cost of Rs.9.62 Lakhs. The scheme will be continued during 2014-15.

  - Further 753 vermicompost units have been established under Rainfed Area Development Programme of NADP during 2013-14.

Vermicomposting - Tradition reinvented - Our forefathers used all the techniques that we are now reverting to; coming close to nature again acknowledges Thiru. Thangavelu of Maranur village in Sathyamangalam block, Erode dt.

As agriculture moves into more and more sustainable models of production, the farmer of the village who realized the importance of natural resources for sustaining soil health resorted to application of vermicompost in his field as recommended by the Extension officers. The confidence in using non chemical approaches helped this farmer to move away from chemical fertilizers towards eco-friendly agriculture. He availed subsidy under NADP and established the vermicompost unit from which he obtained Rs.12,000/- worth vermicompost per annum besides preserving the soil health and increasing the crop production by application of vermicompost in his field.

- Government announced a scheme for Enriching the Soil Fertility through **Trash Mulching** in Sugarcane in an area of 5,000 Ha. at a cost of Rs.1.01 Crore during 2013-14 and the scheme has been completed. This scheme will be taken up in an area of 10,000 Ha. during 2014-15 at a cost of Rs.2.42 Crores.

4.3. Judicious utilisation of Water Resources for crop intensification

Spatial and temporal variations in rainfall, continuous drought and the competing demands for water among

different sectors coupled with drastic climate changes have necessitated smarter, precision technologies for irrigation and farming practices that use ecosystem approaches to conserve water.

Government focuses on knowledge based precision irrigation which involves optimum utilization of inputs and control of both the quantum and timing of water applied to crops. By this way, the farmers are encouraged to increase the number of crops grown per year, bring more area under irrigation and boost the land productivity through prudent use of water saving technologies. Government is making use of all avenues to improve the service delivery of irrigation systems by improving water holding capacity of the sub-basins, de-silting of tanks and ponds to increase their capacity, construction of water harvesting structures such as check dams, farm ponds, percolation ponds for recharging ground water. **Water use efficient technologies** such as System of Rice Intensification and Improved Pulses production technologies as a whole village concept, Sustainable Sugarcane Initiatives, Integrated Farming System, Precision Farming, sprinkler irrigation and Micro Irrigation through drip and rainguns have been taken up intensively under various crop oriented schemes to enhance the crop productivity.

4.4. Integrated Resource Management

4.4.1.Strengthening input delivery system

The phenomenal growth in agricultural production has been triggered by high quality input use as well as technology induced productivity enhancement. Hence timely availability of quality inputs is mandatory for the holistic adoption of crop production technologies. Government plays a proactive role in coordinating, facilitating and regulating the production / procurement, stocking and distribution of

key inputs such as seeds, micro nutrient mixtures, bio-fertilizers and bio-pesticides through the Block Agricultural Extension Centres besides integrating private entrepreneurs, farmer groups, Women Self Help Groups, Commodity Interest Groups etc., for rural input services. The availability of other critical inputs such as fertilizers and credit is ensured through Primary Agricultural Cooperative Credit Societies. Further Government has developed a wide and diverse network to share the information on availability of inputs in the web portal of Agriculture Department.

As a part of the initiatives taken to strengthen the input supply management system, Government would **strengthen** the infrastructure Facilities of the **Agricultural Extension Centres** at Panaimarathupatti and Thalaivasal in Salem district at a cost of Rs.1.20 Crores during 2014-15 under NADP.

4.4.1.1. Seeds

Quality seed is a critical and basic input which determines the agricultural production and productivity and it is unique for each and every agro-climatic zone. Further, the efficacy of other agricultural inputs such as fertilizers, pesticides and irrigation is largely influenced by the quality of seed.

Government has a well structured seed plan for all agro-climatic zones drawn based on various factors such as climate, soil type, water resources, cropping pattern, requirement of farmers, crop plan adopted during contingency situation, targeted Seed Replacement Rate (SRR) etc. Accordingly, Government has built up a vibrant seed industry on Public Private Partnership mode involving farmers, women SHGs, TANWABE groups and NGOs for varietal development, plant variety protection including

revival of traditional promising varieties, sustainable seed production system even for small holdings, creation of infrastructure for seed production, processing and storage besides providing training on seed related aspects. The Government has also set up a separate quality control wing with fool-proof mechanism to ensure distribution of quality seeds to the farmers.

Government is taking necessary measures such as ensuring adequate and timely availability of Breeder & Foundation seeds as per plan, organizing seed farms, incentivizing seed growers for quality seed production, facilitating tie-up with National / State Seed Public Sector Units (PSUs) etc., to achieve the SRR of 33% for self pollinated crops such as paddy, ragi, pulses and groundnut, 50% for cross pollinated crops such as cholam, cumbu and cotton and 100% for hybrids. Government also owns 16 major, 2 medium and 63 mini Seed Processing Units with an annual capacity of 29,600 MT through which seeds produced in the seed farms are processed.

During 2013-14, 15,794 MT of paddy seeds, 284 MT of millet seeds, 3,040 MT of pulses seeds and 4,080 MT of oilseeds were procured and distributed through the Agricultural Extension centres.

The details of quality seed distribution and the Seed Replacement Rate (SRR) programmed for 2014-15 are as follows:-

Crop	Seed Distribution Plan for 2014-2015 (in MT)			
	Total Annual Require-ment	Department Certified Seeds	Private Certified / Truthfully labelled Seeds	SRR (%)
Paddy	1,05,000	34,650	38,850	70
Millets	13,367	770	9,421	76
Pulses	24,027	7,955	1,602	40
Oilseeds	1,05,638	12,670	22,190	33
Cotton	607	100	507	100

In continuance to the best performance under food grain production during 2013-14, it is programmed to implement successful crop specific interventions in a wider extent with an aim to achieve 170 L.MT of food grains in the terminal year of Twelfth Five Year Plan. During 2014-15, food grain production is aimed at 145 L.MT for which the targeted area under food grains has been substantially increased. To achieve this enhanced target, the SRR of food grains has been increased compared to last year for which a comprehensive seed action plan has been formulated to meet the seed requirement. The distribution target through the Department as well as private has been substantially increased in proportionate to the enhanced area.

4.4.1.2. Macro Nutrients

Nutrient management is the key issue in sustainable soil fertility. Intensive agriculture, which helps in increasing the food grain production is at the same time causing problems in terms of nutrient imbalance including greater mining of soil nutrients, deficiency of micronutrients, decreasing organic carbon content and overall deterioration in soil health. In order to meet the projected requirement of agricultural production and sustain the soil fertility, soil test-based farm-specific integrated nutrient management is

recommended through Farmers Integrated Hand Book to increase the soil productivity, crop yield, quality of produce and economic returns of the farmers besides minimizing the environmental hazards.

The Government is taking earnest efforts in formulating season-wise, crop wise, farm wise fertilizer requirement plans every year and also gets allocation of fertilizers from Government of India in time by preparing a season wise supply plan to ensure adequate availability of fertilizers to the farmers through fertilizer companies.

Fertilizer distribution during 2013-14 and requirement for 2014-15 is furnished below:-

(L.MT)

Fertilizer	Allocation 2013-14	Distribution 2013-14	Requirement 2014-15
Urea	12.18	11.91	12.45
DAP	4.22	4.31	5.12
MOP	4.66	4.68	6.09
Complex	7.74	4.45	7.45

The Nutrient Based Subsidy (NBS) policy which was introduced by Government of India (GOI) from 01.04.2010 has resulted in spiraling cost of chemical fertilizers except Urea as the Fertilizer Manufacturers / Importers have been permitted to fix MRP based on the cost of production / import. Hence, the farmers have resorted to application of excess Urea in lieu of DAP and MOP causing imbalance in the nutrient application. As this would adversely affect the soil health and productivity of crops, the usage of SSP and phosphate solubilizing bacteria is being encouraged to reduce the consumption of DAP to a level of 5%. Further, the Government have taken up the matter with Central

Government to withdraw the NBS in view of frequent hike in fertilizer prices by the manufacturers.

To ensure availability of adequate quantity of quality fertilizers in time at affordable prices to farmers, Government of Tamil Nadu have taken commendable initiatives such as exempting 4% VAT on Fertilizers besides providing interest free loan to TANFED for prepositioning adequate quantity of fertilizers. In the past three years, a sum of Rs.429.94 Crores has been sanctioned as interest free loan to TANFED for procuring DAP, Urea and MOP for meeting the fertilizer demand by maintaining the buffer stock.During 2014-15, a sum of Rs.150 crores has been sanctioned to TANFED for timely supply of fertilizers.

4.4.1.2.1. Quality Control

The Government is not only resolute in ensuring the availability of fertilizers in time but also checks the veracity of fertilizers from the point of docking in case of imported fertilizers and from the point of manufacturing to the wholesale / retail outlets in case of fertilizers manufactured locally. The Government strictly enforces the Fertilizer Control Order, 1985 by periodical sampling and analysis in 14 notified Fertilizer Control Laboratories functioning in the State and initiates legal action against the distributors who sell non-standard fertilizers. Government with an aim to **strengthen the quality control of fertilizers**, have sanctioned a sum of Rs.59 Lakhs towards the construction of a new building for Fertilizer Control Laboratory at Seelanaickenpatti in Salem district during 2014-15 under NADP. Further, the existing Fertilizer Control laboratories will be strengthened.

During 2013-14, 17,500 samples were tested of which 635 samples were found non-standard and suitable departmental and legal action have been taken up against

the defaulters. During 2014-15, it is programmed to analyze 17,500 fertilizer samples.

Further, the Government will take appropriate measures to safeguard the interest of farmers in organic cultivation and to ensure the quality of organic manures in the market as per the standards of FCO, 1985.

4.4.1.3. Micro Nutrients

The soil becomes deficient in micronutrients due to intensive cropping, loss of top soil by erosion, loss of micronutrients through leaching, decreased usage of organic manures etc. Considering the importance of micronutrients, Government ensures timely provision of micronutrients in the form of “fortified” fertilizers as a potential source of enhanced crop nutrition to increase the crop production & productivity and quality of the produce.

To analyse the Micro Nutrient status of the soil, all the 30 Soil Testing Laboratories and 16 Mobile Soil Testing Laboratories have been provided with Atomic Absorption Spectrophotometers. Further, out of 14 Fertilizer Control Laboratories, Atomic Absorption Spectrophotometers have been installed in 5 laboratories for analyzing Micronutrients in fertilizers. As the demand for micro nutrients is increasing and new fertilizers fortified with micronutrients have been notified under FCO, 1985, Government will strengthen the remaining laboratories with the facility for analyzing Micronutrients.

Annually 1,600 MT of 14 types of notified Micro Nutrient (MN) Mixtures are produced at Micro Nutrient Mixture Production Centre, Kudumianmalai and distributed to the farmers through the Agricultural Extension Centres after ensuring the quality at 5 Fertilizer Control Laboratories. In order to augment the production of MN mixture, this MN mixture production unit is being modernized at a cost of

Rs.60 Lakhs and MN mixture godown is being constructed at a cost of Rs.130 Lakhs under NADP.

During 2013-2014, 1,409 MT of Micro Nutrient Mixtures were produced and distributed against a target of 1,600 MT. The scheme will be continued in 2014-15 also.

4.4.1.4. Plant Protection

With a vision to alleviate the yield loss due to pests and diseases, Government is adopting various management strategies such as intensive pest surveillance, Integrated Pest Management, creation of adequate infra-structure development for production of bio-control agents, quality assurance on plant protection chemicals besides sensitizing the farmers on various plant protection aspects.

Tamil Nadu Agricultural University has released Virtual Extension software called Crop Doctor for six crops – Paddy, Ragi, Sugarcane, Maize, Coconut and Banana to serve as Farmer friendly extension tool for diagnosing various pests, diseases and nutritional disorders with key visual symptoms and knowing appropriate management methods by farmers themselves. The Department of Agriculture has loaded this software in computers and 125 Touch Screen Kiosks placed at AECs for the benefit of farmers. Further, to have knowledge on crop health in the State, a field reporting format for easy handling by the Farmer Friends will be developed. A small application supporting ordinary mobiles available with farmers will be developed for taking photographs & sending to TNAU for back end advice and activated from the ensuing season through FCMS.

4.4.1.4.1. Pest & Disease Surveillance

Government is focusing on conduct of intensive pest and disease surveillance through fixed plot surveys and

roving surveys at weekly intervals and daily basis respectively, monitoring and forewarning of pest & diseases outbreak, recommendation of crop & pest specific management measures to the farmers through SMS and voice advisories, radio, television, pamphlets, campaigns, etc., and sensitization of farmers on seed borne diseases through massive seed treatment campaigns.

4.4.1.4.2. Integrated Pest Management

As an ecosystem-based approach, Government is promoting Integrated Pest Management (IPM) that serves as the main plan for a safe plant protection strategy with which notable success has been achieved in our State in maintaining a healthy agro-ecosystem. IPM involves use of cultural, mechanical, biological methods and the use of chemicals as a last resort for controlling insects-pests, diseases and weeds. Strategies such as use of quality seed / planting material, crop rotation to suppress pathogens, production and distribution of bio-control agents, elimination of infected host plants, effective weed management, usage of need based chemical pesticides in right quantity at right time, conduct of farmers field schools and extending subsidy for IPM & Non Pesticidal Management technologies have been implemented under various schemes such as NADP, ISOPOM, Technology Mission on Cotton – Mini Mission II and NFSM. Effective implementation of this programme has helped to reduce the consumption of pesticides from 10,926 MT of technical grade in 1984-85 to 2,142 MT in 2013-14. This scheme will be continued during 2014-15 under various Restructured Centrally sponsored schemes.

4.4.1.4.3. Production of Bio Control agents in Bio Control Labs and Integrated Pest Management Centres

Pests and accompanying species such as predators, parasites, pollinators, competitors and decomposers are components of crop - associated ecosystem. With an aim to manage the insect pest population in an ecologically balanced way, Government is producing Bio-control agents through state owned 10 Bio-control labs & 2 Integrated Pest Management Centres and distributing to the farmers at subsidized cost through Agriculture Extension Centres so as to minimize the crop losses due to pests and diseases. Government will strengthen these bio-control laboratories during 2014-15 to augment the production of bio-agents.

Following bio control agents are being produced and distributed to the farmers.

Bio-control agents	Production centres (Nos.)	Pests / Diseases controlled	Area (Ha.)	
			Achmt. 2013-14	Program 2014-15
Trichogramma chilonis (egg parasitoid)	21	Sugarcane Internode borer	10,570	11,000
Bethylid,Braconid [larval parasites] and Eulophid [prepupal Parasites]	12	Coconut Black headed caterpillar	5,121	10,500
Green Muscardine fungus [*Metarhizium sp*]	2	Coconut Rhinoceros beetle	40,000 ml	55,000 ml
Nuclear Polyhedrosis Virus	12	Groundnut Red hairy caterpillar, Prodenia and cotton boll worm	4,250	4,250
Bio pesticides - *Pseudomonas sp*, *Trichoderma viridi*	12	Diseases in cotton, pulses and paddy	10,000	10,000

4.4.1.4.4. Pesticide Testing Laboratories

Government monitors the quality of pesticides by drawing samples from 147 Pesticide Manufacturing Units and 13,321 private sale outlets besides regulating the supply of quality plant protection chemicals to the farmers in accordance to the Insecticide Act, 1968 and Insecticide Rules, 1971.

The quality of the pesticides is ensured through 15 notified Pesticide Testing Laboratories functioning at Kancheepuram, Cuddalore, Salem, Coimbatore, Erode, Thanjavur, Tiruchirapalli, Madurai, Thoothukudi, Vellore, Dharmapuri, Nagapattinam, Theni, Sivagangai and Tirunelveli. During 2013-14, 16,144 samples have been analysed. It is programmed to analyze 21,850 pesticide samples during 2014-15.

Government is also taking special efforts to strengthen 2 State Pesticide Testing Laboratories for obtaining NABL accreditation besides constructing new building for 6 State PTLs at a cost of Rs.5.68 Crores under NADP.

4.4.2. Farming system and crop based technological interventions

Agricultural production in Tamil Nadu is contributed mostly by small and marginal farmers who need a genetically diverse portfolio of improved crop varieties resilient to climate change & suited to a range of agro-ecological zones and improved farming practices for better management of natural resources such as land and water. The following technological framework helps in increasing the production and productivity of crops besides the Input Use Efficiency.

i. Food grain mission

Honourable Chief Minister under Rule 110 has announced the launching of **Food grain Mission** on 6.5.2013 constituting three sub-missions viz., Paddy, Millets and Pulses missions to bring in a paradigm shift from food security to food surplus through a **Mission mode approach**, by bundling the frontier technologies to bridge the yield gap at village, block and district level to achieve a quantum jump in food grain production under the leadership of District Collectors.

During 2013-14, the Food grain mission was implemented at a cost of Rs.112.30 Crores by dovetailing funds from paddy, millets and pulses mission under NADP besides NFSM for paddy and pulses. This scheme will also be continued during 2014-15 with an aim to achieve 145 L.MT. It is noteworthy to mention that Tamil Nadu stands **first** in productivity of rice and maize, **second** in cumbu and **third** in total food grains **at National level**.

ii. Whole Village Concept: Government introduced this concept during 2011-12 for increasing the area under food grains by popularization of SRI technology and SPI. This approach has been conceptualized for conserving all the crop production resources by adopting a package of input saving high productive innovative technologies in a village as a whole to serve as model village. This concept also contemplates on grouping the farmers for bulk production and profitable marketing.

a. System of Rice Intensification

SRI is a novel methodology which involves twelve vital principles meant to increase the yield, save water, reduce the production costs by 25 to 30% and increase the income of the farmers.

SRI technology breaks the jinx - Adoption of SRI has transformed his life, admits Thiru.P.Solaimalai of Villiyankunram village, Madurai district.

A farmer who was passively practicing conventional method of cultivation in paddy resorted to SRI on the advice of the Department officials. The farmer had followed all the recommended steps and the technology had paid him with full benefits. It is amazing to note that the farmer had reaped 8,272 kg per acre which is not possible under conventional method. The farmer attributes his success to decreased cost of irrigation, labour and cultivation besides increasing the cropped area by 50% due to intermittent irrigation. It is of no surprise that he had been awarded with **Prashasthi Patra** and a cash award of Rs.1 Lakh by His Excellency, the President of India. Further, he has also been awarded with a cash prize of Rs.5 Lakhs and a medal by ***Hon'ble Chief Minister*** during the Independence day function for dutiful adoption of SRI.

During 2013-14, 2,000 SRI villages have been organized covering 1.968 L.ha. During 2014-15, this concept will be adopted in 3,000 villages covering an area of 2.50 L.Ha.

During 2013-14, an amount of Rs.26.93 Crores has been allocated to organize 57,206 Demonstrations in SRI under NADP and a sum of Rs.17.14 Crores has been spent. During 2014-15, SRI technology will be adopted in a total area of 13.65 L.Ha.

b. System of Pulses Intensification

Pulse crop, an integral component of subsistence cropping system is grown as bund crop, intercrop, catch crop, relay crop, cover crop, green manure crop *etc*.,. In the present era, pulses have become inevitable in dietary requirements & nutritional security to the growing

population, improving soil health, conserving natural resources and sustaining productivity. Hence, Government is focusing on intensification of pulses cultivation as pure crop as pulses are capable of providing the high economic returns in the shortest possible time to many small and marginal farmers. **'SYSTEM OF PULSES INTENSIFICATION'** on a Whole village approach has been designed and advocated both for irrigated and rainfed areas to enhance the productivity of pulses and reduce the gap between per capita protein requirement and availability.

During 2013-14, SPI has been adopted in 1,712 villages (1.09 L.Ha) and in 2014-15, the programme will be taken up in 2,000 villages covering 1.25 L.Ha.

Further, Redgram transplantation has been taken up in an area of 40,736 Ha. coupled with micro irrigation in 3,857 Ha. This technology has helped to increase the yield two to threefold (1,200-1,500 kg/Ha). An amount of Rs.15.57 Crores has been spent against an allocation of Rs.15.60 Crores for redgram transplantation under NADP-Pulses mission. During 2014-15, Red gram cultivation will be promoted at a total cost of Rs.55.15 Crores in an area of 52,000 hectares of which precision farming will be taken up in an area of 1,000 Ha.

Improved package of practices in Pulses - Black gram makes wonder – Farmers mass contact programme was the turning point in my life, says Thiru.J.Moorthy of Padhirapuliyur village of Tindivanam block, Villupuram district.

It was Uzhavar Peruvizha programme, where he was inspired to adopt improved crop production technologies for doubling the production. He chose to cultivate Vamban-5 Black gram during Karthigai pattam (Nov-Dec) and availed assistance under NFSM-Pulses. He adopted improved

package of practices such as Seed treatment with Rhizobium and Phosphobacteria, application of Farm Yard Manure, split application of fertilizers, maintenance of optimum Plant Population by line sowing with markers, 2 rounds of TNAU Pulse wonder and spraying of Neem oil as a part of organic measure. He was astonished to observe the crop with a maximum of 213 pods per plant and 8-10 seeds per pod. He harvested 2,976 kg per acre and obtained a net profit of Rs.92,000/-

As a special measure, it is programmed to cultivate 'Rice fallow Pulses' **with improved practices'** in an extent of 4.33 L.Ha following samba paddy for which zonewise technologies for enhancement of productivity were formulated besides popularising dibbling technologies for population maintenance. It is also programmed to enhance the pulses area by raising **pulse crop in an additional area** using the water harvested through **70,000 Farm Ponds** being dug under MGNREGS.

Red gram Transplantation - The change what began as curiosity, transformed into a conviction making Thiru.Murugan, Krishnagiri district transplant redgram saplings from nurseries.

The new agricultural practice of raising nursery and transplanting redgram has revolutionised the red gram cultivation. Popularisation of this novel concept had been a boon to the farmer as he was obtaining only around 2,500 kg per hectare by adopting traditional farming techniques. This innovative concept, helped him to obtain a bumper yield of 4,500 kg per hectare, an 80 percent increase in yield as compared to the conventional practice of cultivation (2,500 kg per hectare).

iii. System of Millets Intensification

System of Millets Intensification, an unprecedented technology led revolution in agriculture is characterized by simple modifications in the agricultural practices to boost the productivity of nutrient rich millets. Government is giving due focus to increase the area and productivity of millets by capitalizing innovative management strategies such as precision farming, organizing demonstrations on improved production and post harvest technologies besides cropping system based training, distribution of certified seeds, distribution of seeds of improved varieties / hybrids as minikit, seed production and sensitizing the farmers on various local and indigenous technologies, generating consumers' demand for millet based food products through awareness creation and processing & value addition techniques.

During 2013-14, Millets Mission and Initiatives for Nutritional Security through Intensive Millets Promotion (INSIMP) were implemented at a cost of Rs.5.88 Crores and Rs.2.70 Crores respectively under NADP.

iv. Sustainable Sugarcane Initiatives (SSI)

The Sustainable Sugarcane Initiatives (SSI), a **"Chip Bud Technology"** is an innovative set of agronomic practices which involves raising shadenet nursery using single bud chips, transplanting young seedlings of age 25-30 days, practising new planting methods with wider spacing facilitating intercropping to utilize land effectively, providing sufficient moisture to plants & avoiding flooding of fields by adoption of precision farming / encouraging drip fertigation & application of organic manures for better nutrient management and promoting mechanized harvesting to increase the cane yield significantly.

This technology has been promoted in an extent of 2,905 Ha. in 2012-13. With an objective to promote this technology among sugarcane farmers to achieve a quantum jump in sugarcane productivity, **Honourable Chief Minister under Rule 110 announced upscaling of coverage under Sustainable Sugarcane Initiatives (SSI) to 20,000 Ha. through Sugar Mills at a cost of Rs.275.20 Crores.**

SSI – a path breaking initiative turns sugarcane cultivation sweeter for M.Palanisamy, in Kotuveerampalayam Village in Sathyamangalam block of Erode District.

He obtained a whopping yield of 120 MT in an area of 0.66 Ha (182 MT / Ha) of variety Co 86032 by adopting SSI. He expended an amount of Rs.18,787/- per acre which included part of investment on drip fertigation system. He realized a gross income of Rs.87,877/- per acre.The net profit was Rs.69,090/- per acre.This innovative methodology helped him to reduce the cost of cultivation with an increase in crop yield upto 20%.

During 2013-14, SSI was promoted in an extent of **7,522 Ha.** at a cost of Rs.23.50 Crores. During 2014-15, this scheme will be implemented in an area of 5,000 Ha. at a cost of Rs.17.95 Crores.

v. Tamil Nadu Cotton Cultivation Mission

An ambitious Tamil Nadu Cotton Cultivation Mission has been launched in the State to increase the productivity and production of cotton by **expansion of cotton area** from 1.34 L.Ha to **2.50 L.Ha** and increase the existing productivity level of 493 kg/ha to 870 kg of lint/hectare **over a period of five years.**

As a part of this, it is proposed to bring 1.70 L.Ha with a production target of 6.70 L.bales and increase the

productivity to 670 kg/ Ha during 2014-15 at a cost of Rs.50 Crores for which the funds will be sourced from State and dovetailed from Government of India schemes such as National Mission for Sustainable Agriculture (NMSA), NFSM- Commercial crops & Sub-Mission on Agricultural Extension (SMAE). Activities such as Precision farming, promoting Mechanization, Distribution of quality seeds, Integrated crop management including improved agronomic management practices, INM, IPM, IWM strategies, Efficient transfer of technology through front line demonstrations and Training to farmers on latest technologies, development of compact genotypes in cotton suitable for High Density Planting System, contract farming and mechanized harvest are proposed to be carried out. The scheme will be implemented in all districts except Kancheepuram, Tiruvallur, Karur, Pudukottai, Sivagangai and Kanyakumari during 2014-15.

vi. Precision Farming

Modern agriculture is science based and growers need improved management practices to increase crop productivity and maximize farm profitability while minimizing environmental hazards. Precision Farming is one such site specific crop management concept promoted on cluster basis wherein farmers are being provided with critical inputs such as seeds, water soluble fertilizers at 50% subsidy besides conducting adequate training programme.

Precision Farming in Maize - High profit lures farmers to high-tech precision agriculture, admits Thiru.Sengodan, Mannathi village, Elachipalayam block, Namakkal district.

Precision Farming Technology is an innovative technology that promises increased yield and quality of the produce by tailoring the inputs such as water, fertilizer and

pesticides. The technical guidance given by the Department officials motivated the farmer to join himself in the farmer cluster and raise maize hybrid integrated with the drip irrigation system in 2.5 acres by availing subsidy under NMMI & NADP. He obtained an yield of 10,500 kg from 2.5 acres which gave him an extra income of Rs.50,000 by adopting this location specific approach. He is also one of the leading farmers who plays a significant role in disseminating this technology to his member farmers.

Precision Farming will be implemented in agricultural crops in 5,000 Ha during 2014-15.

vii. Micro Irrigation

Micro irrigation is a localized irrigation method that saves water and fertilizer and is being popularized in a larger extent due to the added advantages of minimal soil erosion, reduced weed menace, uniform water distribution, maintenance of optimum plant population and increase in productivity & quality of agricultural produce. Recognizing the need for promotion of Micro Irrigation, first time in India, the State Government is providing 100% subsidy for SF / MF and 75% for other farmers.

The Micro Irrigation has been promoted in agricultural crops in an extent of 31,822 Ha. in the past three years. During 2014-15, Micro irrigation will be adopted in 37,850 Ha. under various agricultural crops such as Sugarcane, Pulses, Cotton and Coconut.

4.4.3. Integrated farming

Diversification of agriculture by integrating livestock, horticulture, silvi-pastures, fisheries, sericulture, apiary, etc., with the crop production system is a landmark development that ensures sustainable benefits to farmers by maximum utilization of resources in terms of time and space.

Villupuram district has been selected for implementation of Integrated Farming System as a **district saturation model** on pilot basis over a period of three years as it has large extent of cultivable land both under rainfed and irrigated conditions, large potential to increase the productivity and due to its proximity to the urban centre with good connectivity. The scheme implemented as a district saturation model will have the inbuilt potential of higher productivity & income, employment generation, sustained income throughout the year, resilience to climatic changes, holistic development and insulation against income loss.

All existing potential, present trend in cropping pattern, crop rotation, yield trend, allied activities in vogue, management practices, varieties cultivated, present level of income generation etc, and the needs of the farmers in the district will be identified in the pre-project survey. The data generated with the pre-project survey will be analysed to identify the existing deficiencies and opportunities available in the district, to finalise the interventions by the Agriculture Department in coordination with TNAU, Horticulture, Agricultural Engineering, Agricultural Marketing and Agri business.

During 2014-15, an amount of Rs.22.25 Lakhs has been sanctioned towards the cost of consultancy charges to NABCONS for conducting feasibility and fund requirement study for implementation of Integrated Farming System in Villupuram district as a district saturation model.

Integrated Farming system - Success in more ways than one - Integration of various enterprises bears fruits …. ! averred the enthused farmer Thiru.G.Hariharan, Kallikudi Block, Madurai district.

Evolving strategies for enhancing the quality of life of marginal and small farmers is the foremost priority of

Agriculture Department. Small sized holdings coupled with erratic monsoons make it difficult for such farmers to meet both the ends with the income from cropping alone. Hence, a holistic approach of integrating various allied enterprises with cropping has become the need of the hour for better security, sustenance and productivity.

Being an undergraduate, the educated farmer benefitted by this technological intervention has now set an example by his stupendous success. The extension officials motivated the farmer to implement the agri-horti cropping system integrated with organic farming, cow & sheep rearing. The total cost of the system was Rs.1,10,000/-. The farmer availed 50% subsidy from NADP & a loan from the PACCB for the remaining 50% cost. Inputs such as seeds of ADT-45 paddy, cotton & green gram, micro-nutrients, sprayers, fertilizers & PVC pipes were issued by the Department of Agriculture. The Department of Animal Husbandry supplied one cow, 10 sheep, 2,250 setts of Co-4 Fodder & 20 kg mineral salt for cattle feed. He is obtaining 14 litres of milk daily.He produced vermicompost utilizing the dung of cow and sheep by establishing a vermicompost unit of size 12'x4'x3'. A Farm pond of size 30'x30'x6' was established under MGNREGS and Mango, Guava and lemon seedlings were planted around it. Thus the farmer is earning income round the year from various enterprises besides utilizing the farm waste for organic manure production that sustained the health of his land.

4.4.4. Grower's Clusters

Group farming & Cluster approach could potentially transform the face of agriculture through a cohesive and multifaceted approach for optimal use of resources by integrating fragmented land holdings. Government is encouraging the formation of farmer groups for a particular crop or group of crops to reach out better with the entire

gamut of existing schemes and subsidies. It is also easier to transfer the technologies, provide inputs to such groups and facilitate their tie-ups with banks & markets for a profitable farming.

Cluster demonstrations on SRI / direct seeded Rice/ Line transplanting and Hybrid Rice Technology in paddy and Cluster Demonstrations on inter cropping, improved varieties and farm implements in pulses were organized at a cost of Rs.10.55 Crores under National Food Security Mission. Further Accelerated Pulses Production Programme was also implemented on a cluster basis at a cost of Rs.7 Crores. Under NADP, schemes such as precision farming, Sustainable Sugarcane Initiatives and intensification of millets are being implemented on a cluster approach.

4.5. Agriculture Infrastructure Management

Successful strategy for sustainable intensification of crop production requires a fundamental change in the management of agriculture infrastructure & rural investment and capacity development. A close interaction between farmers, extension workers and researchers is needed for diagnosing problems together and working out location specific recommendations. Farmers, farmer groups, Local organizations and agencies will be involved in identifying the real needs, setting up of priorities, planning of facilities from seed to seed, identifying the core areas for provision of infrastructure and will be teamed up in infrastructure creation, maintenance and utilization programmes in coordination with the Department and State Agricultural University.

Government has established and modernized the support infrastructure such as soil and fertilizer testing laboratories, seed processing units, seed godowns, state

seed farms, bio-fertilizer production units, Micronutrient mixture unit, farmers' hub, farmers training centres and agricultural extension centres for strengthening the end to end supply chain besides transfer of technologies from lab to land.

Government has formulated a **Strategic plan in Tamil Nadu Vision 2023 document for infrastructure development in Tamil Nadu.** The major focus of Vision 2023 is agriculture sector so as to achieve 5 per cent annual average growth rate. **The objective of Vision 2023 is** "to achieve the best in class productivity in key agricultural produces and to be a global supplier with robust infrastructure". This vision envisages setting up of **robust infrastructure support** for planning, production, processing, storage, distribution, marketing and sales of agricultural produces. Government would focus on Improving soil fertility, supply of quality seeds, timely provision of quality fertilizers and other chemicals, promotion of organic fertilizers, proper scheduling of irrigation, supporting micro irrigation for controlled water supply and effective extension support during the cropping period.

An amount of Rs.1,21,400 Crores will be invested in the ensuing years on PPP mode towards the **development of Agricultural Infrastructure** across the state for setting up of seed supply chain, improving soil health, promoting Organic Farming, Agricultural mechanization, Micro irrigation, integrated farming system etc. As per Roadmap for Vision 2023, an amount of **Rs.6,977.15 Crores** has been allocated to Agriculture alone. The major crops in all districts have been identified and suitable schemes are being formulated to increase the productivity of the crops with the active participation of private entrepreneurs. Further, it has also been planned to bring the fallow lands under cultivation on Public Private Partnership mode along with food

processing and marketing linkage for Agricultural and Horticultural crops.

4.6. Alternative Energy sources to increase farm Efficiency

As Tamil Nadu is endowed with abundant sunshine hours, solar water pumps are ideal for agriculture and related activities. Solar powered pumps are alternative to conventionally powered systems that can provide continuous pumping throughout the day for a maximum period in a year.

Hence, the Government of Tamil Nadu has come out with a Solar Energy Policy, 2012 wherein it has been proposed to encourage and popularize the use of solar energy in Agricultural sector by providing a package of Solar PV Pumping System linked with suitable Micro Irrigation System along with forward linkage of precision farming / front-end technologies, crop specific improved cultivation methods etc., to the progressive farmers of the State on a pilot basis. During 2013-14, installation of 2500 Nos. of 5 HP solar PV pumping system is in progress. Each pump will have a solar panel of 4800 Wp capacity and will deliver water equivalent to that of a 5 HP AC submersible pumpset. Out of the total cost, 50% will be met from National Agriculture Development Programme and 30 % from the Ministry of New and Renewable Energy. Balance 20% shall be farmer's contribution to be met partly through loan and partly through farmer's direct contribution for which PACCS have been directed to provide a loan amount to a maximum of Rs.1 Lakh.

Farm mechanisation is imperative to increase the productivity of the land and to cope with shrinking agricultural employment. Government is focusing on promotion of small and marginal farmers' friendly

machineries to carry out the farm operations in time and to reduce the drudgery of farmers. Previously, the farmer has to approach in person for booking the farm machinery in Agriculture Engineering Department which drains time and money. Hence, the Department of Agriculture has provided an **online booking system of farm machinery** through the existing AGRISNET web portal. With this system, the farmer can plan well ahead about the requirement of farm machinery and book it online through telephone and can make payment online through a payment gateway. This would help the farmers from exhaustion of time and money.

4.7. Invigorating the Extension machinery

Government has framed strategies for strengthening the field extension mechanism for transfer of technology through line departments anchored by frontline extension systems of the ICAR Institutes and SAUs, Commodity Boards, NGOs, voluntary organizations and Farmers' Consortiums.

Government has provided **379 vehicles** at a cost of Rs.23.37 crores to the extension functionaries for effective dissemination of technologies from lab to land and to ensure that the benefits reach the right beneficiaries at the right time.

Government is determined to harness the potential of ICT in agriculture and has developed ICT tools for empowering the farmers to take timely and quality decisions thus leading to industrialization of farming or farm business enterprises. To provide extension and advisory services round the clock to the ultimate users – the farmers - for optimizing their productivity and income and to provide networking of agriculture sector globally, **Hon'ble Chief Minister** has launched series of new initiatives such as **Farm Crop Management System (FCMS) and Farmers**

Integrated Handbook, Touch Screen Kiosks, new software modules such as farmers' database collection through mobile application, agro advisory service, farmers data updation through Interactive Voice Response (IVR), scheme benefit tracking system and online booking of farm machinery hiring system for effective individual farm planning, management of inputs and speedy transfer of extension activities under AGRISNET platform.

Government is also focussing on minimizing the time-lag between technology generation and adoption at the village level through a 'cafeteria of activities' under SMAE. This strategy ensures preparation of Strategic Research and Extension Plans (SREP) through Participatory Rural Appraisal to encourage bottom up planning, integration of all the stakeholders for empowering the farming community besides encouraging farmer friends, CIGs,SHGs, NGOs etc. for effective dissemination of technologies.

As announced during 2011-12, Government is in the process of establishing **Farmers' Hub** at 10 places at a total cost of Rs.15 crores which would serve as a platform for knowledge sharing on innovative technologies and a one stop spot for solving all field oriented problems related to Agriculture and sister departments. **Nine hubs have been completed in** Tiruchirapalli, Dindugul, Thanjavur, Madurai, Coimbatore, Kancheepuram, Erode, Ramanathapuram & Thoothukudi districts.

Various Knowledge and Training centres such as Farmer Training Centres, Water Management Training Centre, State Agricultural Extension Management Institute (STAMIN), State Agricultural Management and Extension Training Institute (SAMETI) are functioning in the State to impart training to the extension functionaries, farmers, farm women and rural youth on management practices and technologies in agriculture.

4.7.1 Promotion of Traditional Agro products: Hon'ble Chief Minister under Rule 110 made an announcement to create awareness among the public on a campaign mode about the values and importance of tender Coconut, Shikakai, Cotton and other **traditional agro products** like millets at a cost of Rs.10 Crores. The programme was implemented in all 385 Blocks of Tamil Nadu involving the Departments viz., Agriculture, Horticulture, Forestry, Agricultural Marketing, Co-optex, Khadi & Village Industries and Tamil Nadu Agricultural University. Activities such as Publicity and awareness involving mass media, conduct of Rallies and seminars, erection of hoardings, Advertisements and production of Documentary Films were carried out.

4.7.2. Farmers' Training Centre

The role of **Farmers' Training Centre** is of immense importance in the overall development of agriculture as it is involved in honing the skills of farmers on latest agricultural technologies, bringing reforms in agriculture by effective dissemination of information from lab to land and ensuring complete technology adoption at field level. There are 22 Farmers Training Centres functioning in the State which are involved in activities such as planning and conducting production - oriented, need-based short and long duration on-campus & off-campus (village based) training programmes, Convenors' training, method demonstration, awareness campaigns, Mass contact programmes, Exhibitions, Radio talk and television programmes, farm visits besides providing technical advisory services to the farmers, farm women and rural youth on management practices and technologies such as quality seed production, crop diversification, Integrated Pest and Disease Management, Integrated Nutrient Management, System of Rice Intensification, Improved Pulses Production Technologies, Sustainable Sugarcane Initiatives, Precision

Farming, Micro Irrigation, value addition, farm mechanisation etc.

4.7.3. Water Management Training Centre

Water Management Training Centre at Vinayagapuram, Madurai district functioning from 1985 emphasizes on sustainable water resource management besides crisis management by inculcating farmers and extension functionaries on location specific water conservation technologies, soil and water relationship, scheduling of irrigation, rotational water supply, adaptation to rapid changes in cropping pattern due to erratic rains or failure of monsoon, summer ploughing, land levelling, crop specific innovative technologies and cultivation methods, rainwater harvesting, surface irrigation, micro-irrigation system, weed and fertilizer management and interventions in mitigating drought.

4.7.4. State Agricultural Extension Management Institute (STAMIN)

The **State Agricultural Extension Management Institute** commissioned in the year 1975 at Kudumianmalai, Pudukottai district is a Centre of Excellence which imparts training on managerial and technical skills to Agricultural Extension Officers. The institute which is unique in its style of functioning offers demand driven capacity building to the extension functionaries that helps in developing a professional extension service capable of assisting farmers in increasing the crop production and income and thereby provides adequate support for agricultural development.

A **State Agricultural Management and Extension Training Institute** (SAMETI) has been established at a cost of Rs.99.75 Lakhs in the premises of STAMIN, to provide consultancy services in areas like project planning, appraisal, implementation & evaluation, develop & promote

the application of Management tools for improving the effectiveness of Agricultural Management Service through optimal use of available human resources, organize need based training for middle & grass root level workers, provide & develop management, communication and participatory methodologies as a sequel to feed-back from training programmes.

The details of training given by STAMIN in 2013-14 are furnished below.

Sl. No	Details of training	No. of officers trained
1	Office Management training	200
2	Computer training	192
3	Office Administration training	320
4	Orientation training to newly recruited Agricultural Officers	120
5	ISOPOM (Oilseeds) training	690
	Total	**1,522**
	Finance (Rs. in lakhs)	**12.060**

4.8. Human Resource Management

The Government which is very keen on permeating the innovative technologies upto the farmers' fields emphasizes a demand-driven capacity building of extension functionaries, farmers and other stake holders. Government has established various Extension Education and technology Institutes to produce high quality professional leaders to serve as trainers of various training programmes. Training and handholding support are provided to all stakeholders including unemployed agriculture graduates to tap their potential for agri-preneurship. The knowledge gap is bridged by strengthening communication and knowledge sharing by organizing demonstrations, exhibitions, field trips & exposure visits, workshops, technical seminars and

trainings, mobile field services, tele-advisory services, SMS-based agroadvisory services, setting up of information kiosks to get acquainted with various crop production technologies including integrated agriculture, organic farming, farm mechanization, post harvest management, value addition, etc.,

Government have prepared the following **booklets** with an aim to highlight all the initiatives taken by Agriculture and sister Departments to bridge the knowledge gap between scientists and department officials and the yield gap at farm level to increase Food Grain production:

- Second Green Revolution in Tamil Nadu
- Food Grain Mission
- Path breaking Initiatives in the last 3 years
- Tamil Nadu Vision 2023 - Roadmap for Agriculture

To empower the farmers for better understanding of technical information and motivate them for adoption of good agricultural practices to increase the farm income besides serving as a **ready reckoner** for easy understanding of status of agriculture in the village, the following books have been prepared with due care :

- Compendium on improved agricultural technologies
- Compilation of success stories
- Village level resource book for all revenue villages
- District compendium on agriculture
- Hand book for all extension officers

4.8.1. Crop Yield Competition

Agriculture is a crop science and sound scientific farming technologies are the prime mover in increasing the production & productivity by maintaining land quality, conserving critical resources, adopting appropriate and integrated plant protection measures etc. Awareness of such resource efficient innovative technologies is the need of the hour for which Crop Yield Competitions are conducted to enthuse farmers, to adopt progressive location specific farming practices for increasing the farm productivity. Such farmer-centred competitions are conducted in Paddy, Maize, Groundnut (irrigated), Cholam (irrigated), Cumbu (Irrigated), Blackgram & Greengram (Irrigated) both at District and State levels.

Totally, 62 District Level Competitions and 6 State Level Competitions are conducted every year for which an enrolment fee of Rs.100/- for Paddy and Groundnut and Rs.50/- for other crops for State Level entry and Rs.50/- for Paddy and Groundnut and Rs.25/- for other crops for district level entry is collected. The following prize amount is awarded to the farmers who obtain the highest productivity at State and District level.

(in Rs.)

Crop	State Level		District Level	
	1st Place	2nd Place	1st Place	2nd Place
Paddy & Groundnut	25,000	15,000	15,000	10,000
Other Crops	15,000	10,000	10,000	5,000

The scheme will be continued during 2014-15 also. Moreover, the farmers may enroll under SRI Crop Yield Competition, by paying a registration fee of Rs.150/-. A medal worth of Rs.3,500/- and a cash prize of Rs.5 Lakhs

will be given by the **Hon'ble Chief Minister** on the Republic Day function to the farmer who obtains the highest yield in paddy by adopting System of Rice Intensification technology.

4.9. Calamity Relief

Risk and uncertainty are ubiquitous in agriculture and emanate from uncertain weather, pests and diseases, volatile market conditions and unstable commodity prices. The impact of climatic change in Tamil Nadu is significant as agriculture in our state is dominated by small holders who lack resources to mitigate and cope with risk. Prevention and mitigation are the primary strategies formulated to minimize the impact of disasters through forewarning, techno - advisory information, implementation of crop insurance schemes, extending enhanced relief assistance to compensate the crop losses at distress times and protect the livelihood of the farmers by infusing confidence to adopt frontier technologies to increase the crop yields. A sum of Rs.242.54 Crores has been provided for implementation of crop insurance schemes during 2014-15.

During 2013-14, Government sanctioned an amount of Rs.2.211 crores as second year maintenance subsidy for replanted coconut seedlings under the scheme "**Agriculture package for rejuvenation of Coconut gardens affected by cyclone Thane**". An amount of Rs.2.125 crores has been spent benefitting 4,967 farmers of Cuddalore and Villupuram districts. During 2014-15, an amount of Rs.2.633 crores will be provided as third year maintenance subsidy.

5. Restructured Centrally Sponsored Schemes

5.1. National Mission on Oilseeds & Oilpalm (NMOOP)(75:25)

The Integrated Scheme for Oilseeds, Pulses, Oilpalm and Maize (ISOPOM) scheme which was implemented from 2004-05 with an objective to formulate programmes that increase the productivity of Oilseeds, Pulses, Oilpalm and Maize besides promoting crop diversification on a regionally differentiated approach has been restructured by Government of India. The Oilseeds and Oilpalm components have been merged with National Mission on Oilseeds and Oil palm (NMOOP) and components of Maize with NFSM - Coarse cereals from 2014-15.

ISOPOM was implemented with Centre and state Government financial assistance on 75:25 basis. The scheme was implemented during 2013-14 with a total allocation of Rs.14.15 Crores of which an amount of Rs.13.28 Crores has been spent. The crop-wise expenditure details are as follows:

Rs. in Crores

Crop	Allocation	Expenditure
Oilseeds	11.65	11.23
Oilpalm	1.32	0.90
Maize	1.18	1.15
Total	**14.15**	**13.28**

Tamil Nadu ranks **first** in the productivity of groundnut and sunflower and **second** in total oilseeds at National level**. National Mission on Oilseeds and Oil Palm** (NMOOP) is implemented from 2014-15 onwards with an objective of increasing the production of vegetable oils sourced from oilseeds, oilpalm and Tree Borne Oilseeds

(TBOs). It is proposed to implement three Mini Missions one each for oilseeds, oilpalm and TBOs with Centre and State Government financial assistance on 75:25 basis.

5.1.1. Mini Mission-I on Oil Seeds

The Mission envisages on strategies such as Seed Replacement Ratio (SRR) with focus on varietal replacement; increasing irrigation coverage under oilseeds from 26% to 36%; diversification of area from low yielding cereal crops to oilseed crops; inter-cropping of oilseeds with cereals/ pulses/ sugarcane and use of fallow lands after paddy cultivation.

During 2014-15, seed components such as purchase of breeder seeds, production of Foundation and Certified seeds & distribution of certified seeds, production components such as distribution of plant protection equipments,insecticides, Bio-pesticides, Weedicides, micronutrients, NPV, Bio-fertilizers, Improved farm implements, pipelines to carry water from source to field, sprinkler sets, transfer of technologies through Block demonstration, demonstrations on IPM, training of officers and farmers on latest technologies are being carried out. This programme is implemented in all the districts except Kanyakumari & The Nilgiris at a total cost of Rs.10.01 Crores.

5.1.2. Mini Mission-II on Oil Palm

The Mission focuses on strategies such as expansion of cultivation of Oil Palm in watersheds and wastelands; increasing availability of quality planting materials of Oil Palm; enhancing procurement of fresh fruit bunches and Inter cropping during gestation period of oil palm to provide economic returns to the farmers.

During 2014-15, oil palm cultivation is proposed to be brought in an additional area of 1,600 hectares besides providing maintenance subsidy to older plantations. Production inputs for intercropping in oil palm fields and transfer of technology through farmers training are also being carried out. An amount of Rs.3.51Crores has been allocated to implement this scheme.

5.1.3. Mini Mission-III on Tree Borne Oilseeds (TBOs)

The Mission contemplates on enhancing seed collection of TBOs, increasing the availability of elite planting materials for area expansion under waste land and collection & processing of TBOs besides intercropping.

During 2014-15, it is proposed to implement components such as development of nurseries and plantation on waste lands, intercropping and training of farmers on improved practices for which an amount of Rs.0.42 Crores has been allocated.

5.2. National Mission on Agricultural Extension & Technology (NMAET)

The objective of the scheme is to make the extension system farmer-driven and farmer-accountable through new institutional arrangements for technology dissemination. It aims to restructure and strengthen agricultural extension to enable delivery of appropriate technology and improved agronomic practices to farmers through interactive methods of information dissemination, use of ICT, popularisation of modern and appropriate technologies, capacity building and institution strengthening to promote mechanisation, availability of quality seeds, plant protection etc. and encourage aggregation of Farmers into Interest Groups (FIGs) to form Farmer Producer Organisations (FPOs).

NMAET consists of **4 Sub Missions** viz., Sub-Mission on Agricultural Extension (SMAE), Sub-Mission on Seed and Planting Material (SMSP), Sub-Mission on Agricultural Mechanization (SMAM) & Sub-Mission on Plant Protection and Plant Quarantine (SMPP).

5.2.1. Sub-Mission on Agricultural Extension (SMAE)

The Revised ATMA Scheme which was implemented from Eleventh plan period with the funding support of Centre & State in the ratio of **90:10** for all components except Farmer Friend (50:50) in all the districts of Tamil Nadu with coordinated efforts of Agriculture, Horticulture, Animal Husbandry, Sericulture, Fisheries, Forestry, Agricultural Engineering, Agricultural Marketing and Agri Business, Co-operative department and Tamil Nadu Agricultural University has been renamed as **Sub-Mission on Agricultural Extension (SMAE)** during 2014-15. A sum of Rs.30.14 Crores was allocated and Rs.25.91 Crores spent under revised ATMA during 2013-14.

5.2.2. Sub-Mission on Seeds and Planting Material (SMSP)

Seed Village Programme which was implemented from 2006-2007 envisaged compact area / cluster approach for seed production to ensure supply of quality certified seeds of high yielding varieties to the farmers at right time at their places at affordable prices besides ensuring quick multiplication of new seed varieties to meet the requirement of farmers. An amount of Rs.19.06 crores has been spent during 2013-14.The scheme has been restructured as **Sub-Mission on Seeds and Planting Material (SMSP**) from 2014-15 onwards and will be operated with **full Central assistance**. The new scheme will be implemented with the objective of distributing Foundation/Certified seeds of paddy & millets at 50% subsidy and that of oilseeds & pulses to the

farmers at 60% subsidy for an acre besides training them on scientific methods of quality seed production to meet their own requirement and increase their farm income. This scheme has been proposed to be implemented at a cost of Rs.20.45 Crores during 2014-15.

As announced during 2011-12, the processing capacity of 10 existing Seed Processing Units has been augmented by modernizing the Seed Processing Units at Pudurpalayam (Tiruchirappalli), Bhavani (Erode), Kattuthottam (Thanjavur), Annapannai (Pudukottai), Thirumanoor (Ariyalur), Inungur (Karur), Kallakurichi (Villupuram), Karaiyiruppu (Tirunelveli), Rasipuram (Namakkal) & Anaimalai (Coimbatore). Further 2 seed storage godowns are being established at Sankarapuram (Villupuram) & S.Pudur (Sivagangai) at a cost of Rs.25 Lakhs each .

5.2.3.National e-governance Plan-Agriculture (NeGP - A)

The continued increase in globalization and integration of food markets has intensified competition and efficacy in the agriculture sector and has brought unique opportunities to include more small and marginal farmer holders into supply chains. Yet in the same vein, agriculture faces a range of modern and serious challenges such as price shocks, climate change and deficiencies in infrastructure in rural areas.

In this context, the need for information becomes most vivid. The small and marginal landholders, who play a significant role in meeting the food requirement of the State need information on innovative technologies and strategies to advance their work. The smallholders who remained dependent primarily on word of mouth, previous experience and local leadership have now been empowered with **digital**

tools to obtain information on varieties, production techniques, prices, markets, services, storage and processing.

e-Governance in Tamil Nadu aims at improving delivery of extension services to extension officials and farmers through the service delivery outlets in their locality to ensure efficiency, transparency & reliability of services extended by the Government to meet the requirements of the farmers. **Government of Tamil Nadu leads the rest of the country** in effective utilization of **ICT tools** in agriculture under AGRISNET platform. The State delivers a collection of initiatives, technologies and processes that hold great promise for agriculture and rural development. Needless to say, the initiatives taken by the State in the past two years such as **Farm Crop Management System (FCMS), Mobile Enabled Computer Server Gateway, Web Based Scheme Benefits tracking System, Online Farm Machinery Rental System and Voice Enabled Computer Server Response Interface** have become a role model as the new ICT initiatives have found a place in the **National e-Governance Plan (NeGP-A).**

During 2014-15, the **Innovative Technology Dissemination (ITD) Interventions** will be operated with Centre and State Government financial assistance on **75:25** basis and **NeGP-A** on **90:10** basis.

- **Farm Crop Management System (FCMS),** a state-of-the-art tool in the entire country for individual farm level intervention by the Extension functionaries has been developed and location specific recommendations have been given to each and every farm individually.
  - So far 3,32,500 crop plans have been developed in the pilot blocks of Vellore, Erode, Coimbatore, Tiruvarur, Tiruchirapalli and Virudunagar districts and will be upscaled to the rest of the state also.

  - 2,319 Tablet PCs enabled with 3G, GPS and GPRS have been distributed to grass root level extension functionaries at a cost of Rs.4.64 Crores to facilitate field monitoring during critical crop stages through biometric observations for yield analysis besides pest and disease monitoring. During 2014-15, it is proposed to synchronize the extension activities of Horticulture and Marketing wing to deliver integrated services to the farmers from seed to seed by providing IT gadgets.
- **Virtual Extension- Dissemination of Technology**
  - 150 nos of **pico mini projectors** have been provided to the extension officials of each block in the pilot districts to demonstrate the salient technologies through Video Clippings at the farmers door step. An amount of Rs.0.45 Crores has been spent.
- To create “Know it yourself” concept among the farming community, 125 nos of “All in one” **touch screen kiosks** at a cost of Rs 0.81 Crores have been provided at block level. The cropwise expert systems to clarify doubts on cultivation technologies and **Crop Doctor,** an exclusive soft ware module have been developed by Tamil Nadu Agricultural University to get on-the-spot remedial measures by comparing the real symptoms of pest and disease with 1000s of images available.
- **Mobile Enabled Computer Server Gateway** has been launched to provide Mobile Enabled Agro Advisories to the farmers
  - The database of around 71 lakh farmers has been collected under FCMS.
  - About 13.78 Crores region specific Text advisories and 1.3 Crore of Voice advisories have been sent to farmers by block and district

level extension functionaries and the state **stands first in the country.**
  - Government have sanctioned a sum of Rs.2.65 Crores towards delivering services through voice advisories. So far 2.10 Crore farmers have been benefitted.
  - Location / crop specific information, Crop related technologies of Agriculture and Horticulture, Dynamic information on Market prices, Market trends and Weather forecast are being delivered.

5.3. National Agriculture Development Programme

National Agriculture Development Programme, a special Additional Central Assistance Scheme with 100% assistance of Government of India was launched during 2007-08 wherein the States have been given greater flexibility and autonomy to plan, develop and execute state-specific projects based on the priorities of the districts and the state so as to achieve 4% annual growth in agriculture, by ensuring holistic development of Agriculture and allied sectors through formulation of improved production technologies, creating robust infrastructure and commendable assets.

Objectives

- To increase public investment in agriculture and allied sectors
- To ensure the preparation of agriculture plans for the districts and the states based on agro-climatic conditions, availability of technology and natural resources
- To ensure that the local needs/crops/priorities are better reflected in the agricultural plans of the states
- To reduce yield gap in key crops through focused interventions

- To maximize returns to the farmers in Agriculture and allied sectors
- To bring quantifiable changes in the production and productivity of agriculture and allied sectors

Government, with a main focus to increase the production and productivity of crops especially food grains, promote food & nutritional security and increase the productivity of rainfed crops for Sustainable Agriculture besides adopting diversified and composite farming systems to mitigate adverse climatic effects implemented schemes viz., Paddy, Millets & Pulses mission, Initiatives for Nutritional Security through Intensive Millets Promotion (INSIMP), Oil Palm Area Expansion (OPAE),Rainfed Area Development Programme (RADP), Sustainable Sugarcane Initiatives, Enrichment of Soil Fertility through Trash Mulching in Sugarcane, Bringing Fallow lands under cultivation, Farmers mass contact programme, Comprehensive Input Supply Management System, GIS Soil mapping by fast tracking of soil analysis and Distribution of FIHB and Invigorating Extension system through efficient use of ICT tools during 2013-14 with the total allocation of Rs.148.54 Crores. Further OPAE was extended to 26 districts (except Madurai, Ramanathapuram, Thoothukudi, Kanyakumari, Chennai & Nilgiris) during 2013-14 and was implemented in 2,625 Ha.

During 2014-15, OPAE is merged with NMOOP, INSIMP with NFSM-Coarse cereals and RADP with National Mission for Sustainable Agriculture. The following projects are being implemented under NADP during 2014-15.

(Rs. in Crores)

Sl. No	Schemes Proposed to be Implemented	Amount proposed
1	Programme on Paddy Mission	10.19
2	Programme on Millets Mission	3.79
3	Programme on Pulses Mission	16.25
4	Programme on Oilseeds Mission	5.01
5	Enrichment of soil fertility through trash mulching	2.42
6	Distribution of coconut seedlings	0.68
7	Infrastructure improvement of State Coconut nurseries	0.63
8	Infrastructure improvement of Agriculture Extension Centres	1.20
9	Construction of FCL in salem district	0.59
10	Establishment of Organic Fertilizer Testing Laboratories	2.84
11	Promoting redgram cultivation for nutritional security	18.52
12	IT empowerment of field functionaries by providing Tablet PCs	1.60
13	Strengthening of 7 BFPUs for production of liquid biofertilisers	8.93
14	Kuruvai package to delta districts	5.06
15	Distribution of Farmer's Integrated hand book	4.99
	Grand Total	**82.70**

5.4. National Food Security Mission (NFSM)

National Food Security Mission was launched in 2007–08 to ensure food and nutritional security by addressing the major constraints of crop productivity through promotion of relevant location specific technological interventions in rice and pulses alone on a mission mode approach. The mission focused on paddy growing districts with rice productivity below the state average and pulses growing districts with potential for area expansion and production enhancement. During 2014-15, the mission has been restructured and extended to coarse cereals and commercial crops with the following objectives:

- Increasing production of rice, pulses, coarse cereals and commercial crops through area expansion and productivity enhancement in a sustainable manner.
- Restoring soil fertility and productivity at the individual farm level.
- Enhancing farm level economy (i.e. farm profits) to restore confidence amongst the farmers.

The scheme will be implemented with full Central Assistance.

5.4.1. NFSM- Rice

National Food Security Mission for Rice which was implemented in 5 districts viz., Pudukkottai, Tiruvarur, Nagapattinam, Ramanathapuram and Sivagangai will now be extended to 3 more districts viz., Thanjavur, Tiruvannamalai and Cuddalore.

Under National Food Security Mission – Rice, activities such as Cluster demonstrations on SRI / direct seeded Rice/ Line transplanting,Hybrid Rice Technology, Swarna Sub-1 variety & cropping system based demonstrations, distribution of quality seeds of High Yielding

varieties & hybrids, micro nutrients, plant protection chemicals, weedicides, sprayers, power sprayers, power weeders, pumpsets, rotavators, paddy thresher & self propelled paddy transplanter, organising community nursery, assistance for custom hiring paddy transplanters & combine harvesters besides cropping system based trainings are being taken up at a cost of Rs.27.34 crores during 2014-15. This scheme was implemented during 2013-14 at a cost of Rs.22.36 Crores.

5.4.2. NFSM- Pulses

National Food Security Mission for Pulses is implemented in all districts except Chennai and Nilgiris. Under National Food Security Mission – Pulses, activities such as Cluster Demonstrations on improved package & cropping system based demonstrations, distribution of Certified Seeds of high yielding varieties, gypsum, Micronutrient mixture, bio-fertilizers, plant protection chemicals, weedicides, seed drills, rotavators, zero till seed drill, multi-crop planter, pumpsets, pipes, sprinklers, mobile rainguns, spraying of Pusa hydrogel besides cropping system based trainings on improved technologies are being taken up at a cost of Rs.33.47 Crores during 2014 – 15. This scheme was implemented during 2013-14 at a cost of Rs.15.53 Crores.

Accelerated Pulses Production Programme (A3P) which was implemented under NFSM- Pulses during 2013-14 in 163 compact units of 100 Ha. each at a total cost of Rs.7.01 Crores has now been withdrawn.

5.4.3. NFSM- Coarse Cereals

National Food Security Mission for coarse cereals is proposed to be implemented in 10 districts viz., Salem, Coimbatore, Dharmapuri, Krishnagiri, Tiruchirapalli,

Perambalur, Tirupur, Dindugul, Theni and Thoothukudi. Activities such as Demonstrations of improved package, distribution of Certified Seeds of high yielding varieties and hybrids and establishment of water harvesting structures with portable mobile sprinklers, Demonstrations by NGOs are being taken up at a cost of Rs.7.64 Crores during 2014 - 15.

5.4.4. NFSM- Commercial Crops

Cotton is the most important commercial crop and is generally regarded as the King of Textile Fibres due to its significant contribution to the National economy. The Technology Mission on Cotton (TMC) was under implementation with Centre and state Government financial assistance on 75:25 basis in all the potential districts of Tamil Nadu during 2013-14. The scheme was introduced with an objective to increase cotton production & productivity through improved technologies, reduce contamination & improve the quality and generate IPM technologies for the management of important cotton pests (sucking pests and bollworms) besides disseminating to farmers through training programmes and Front Line Demonstrations. An amount of Rs. 0.53 Crores was allocated towards Front Line demonstration on production technologies, distribution of certified seeds, Pheromone traps, bio-agents and bio-pesticides besides training the farmers through farmers' field school of which a sum of Rs.0.51 Crores has been expended. During 2014-15, the scheme has been amalgamated with NFSM – Commercial crops with 100% Central assistance and will be implemented for cotton and sugarcane.

NFSM for cotton based cropping system is being implemented in 11 districts viz., Salem, Dharmapuri, Madurai, Virudunagar, Tirunelveli, Theni, Dindugul, Villupuram, Perambalur, Thoothukudi and Coimbatore.

Activities such as organizing Front Line Demonstrations on Integrated Crop Management, Desi and Extra Long Staple Cotton, Seed production of Extra Long Staple Cotton, Intercropping besides organizing trials on High Density planting are implemented at a cost of Rs.0.30 Crores during 2014 - 15.

NFSM for sugarcane based cropping system is implemented in 7 districts viz., Cuddalore, Villupuram, Salem, Namakkal, Erode, Ariyalur and Thanjavur with activities such as Front line Demonstrations on intercropping and State level training at a cost of Rs.0.31 crores during 2014 - 15.

5.5. National Mission for Sustainable Agriculture (NMSA)

National Mission for Sustainable Agriculture (NMSA) has been formulated for enhancing agricultural productivity especially in rainfed areas by progressively shifting to environment friendly technologies, focusing on integrated farming, crop diversification, soil and water conservation, soil health management, water use efficiency and synergizing resource conservation through community based approach besides aiming at promoting location specific improved agronomic practices.

Objectives:

- To make agriculture more productive, sustainable, remunerative and climate resilient.
- To conserve Natural resources.
- To adopt Comprehensive Soil Health Management Practices.
- To optimize utilization of Water Resources.

During 2014-15, components such as Rainfed Area Development (RAD), Soil Health Management (SHM), On Farm Water Management (OFWM) and Climate Change

and Sustainable Agriculture Monitoring, Modelling & Networking (CCSAMMN) will be implemented.

5.6. Agriculture Insurance Schemes

Crop insurance, an effective bulwark of rural economy plays a pivotal role in stabilizing the growth of agriculture sector by bringing financial stability to the remotest and poorest farmers in an effective manner to meet out their diverse needs. During 2013-14, the State Government implemented Crop Insurance schemes viz., National Agricultural Insurance Scheme (NAIS), Modified National Agricultural Insurance scheme (MNAIS), Weather Based Crop Insurance Scheme (WBCIS) and Coconut Palm Insurance Scheme (CPIS) till Kharif, 2013. From **Rabi 2013–14 onwards,** NAIS has been withdrawn and the **National Crop Insurance Programme** formulated by merging MNAIS, WBCIS and CPIS is under implementation.

During 2013-14, NAIS and MNAIS were implemented with an allocation of Rs.50.865 Crores. A sum of Rs.36.50 Crores was extended as premium subsidy under NAIS till Kharif, 2013 and 5,02,800 number of Farmers were enrolled under the scheme. Under MNAIS, a sum of Rs.14.12 Crores was extended as premium subsidy and 1,55,000 number of farmers have been enrolled under the scheme. Under CPIS, a sum of Rs.0.17 Crores was extended as premium subsidy and 2,402 farmers have been enrolled under the scheme. With regard to WBCIS, an amount of Rs.1.26 Crores was spent towards enrollment of 19,298 farmers in the 11 pilot districts viz., Theni, Tirunelveli, Tirupur, Salem, Dharmapuri, Virudhunagar, Perambalur, Ariyalur, Villupuram, Dindigul and Coimbatore.

Further, a total sum of Rs.27.67 Crores was extended as premium subsidy for Samba and Thaladi crops

under universal coverage in the delta districts during 2012-13 by the State Government. However, due to the rousing reception given by the farmers of the delta districts for the scheme and their interest in enrolling under universal coverage, additional sum of Rs.38.44 Crores was sanctioned as premium subsidy during 2013-14 by the state Government to settle the additional premium subsidy claims of 2012-13. Totally 8,21,822 number of farmers were benefitted under NAIS and 1,54,545 under MNAIS.

5.6.1. Compensation under Insurance Schemes

Under NAIS, compensation claims are equally shared by the Central and state government if the claim exceeds the premium amount collected by Agriculture Insurance Company. The Agricultural Insurance Company pays compensation upto 100% premium collected for food and oilseed crops and 150% for annual and commercial crops, if the claim is less than the premium collected. In the recent years, seasonal variation compounded with either poor or excess rainfall has become common phenomenon and the State government's dual role in executing strategies to increase production and productivity of crops on one hand and simultaneously compensating the farmers on account of weather perils on the other hand have been a routine one. However undaunted by these inherent deficiencies in the Agriculture system, Government has taken arduous efforts to compensate the farmers in time in the event of crop loss due to natural calamities.

During 2013-14, a sum of Rs.740.80 Crores (GOI share : Rs.303.405 Crores ; State government share: Rs.303.405 Crores; AIC share: Rs.133.99 Crores) was disbursed as compensation to 5,54,257 farmers towards crop loss due to unprecedented drought that occurred during the year 2012-13. Further, an amount of Rs.49.398 Crores has been disbursed as compensation to

79,402 farmers under MNAIS for the Samba/Thaladi/ Pishanam season paddy crop affected by drought in Cuddalore, Sivagangai and Namakkal districts during 2012-13.

5.6.2. National Crop Insurance Programme (NCIP)

Government of India has issued administrative approval to withdraw NAIS and implement a new Central Sector Scheme namely **National Crop Insurance Programme (NCIP)** / Rashtriya Fasal Bima Karyakram (RFBK) merging MNAIS, WBCIS and CPIS from Rabi 2013-14 with modification in premium slab and operational procedures. Government after detailed evaluation of the modifications effected by GOI has opted for MNAIS scheme alone as it is observed to be more beneficial to farmers compared to WBCIS for food and oilseed crops.Hence, MNAIS which was implemented on pilot basis in 3 districts has been extended to all districts from Rabi 2013-14 besides continuing the implementation of Coconut Palm Insurance scheme in all districts under the new National Crop Insurance Programme.

5.6.2.1. Component I: Modified National Agricultural Insurance Scheme

The main objective is to provide insurance coverage and financial support to the farmers in the event of prevented sowing & failure of any of the notified crops as a result of natural calamities, pests & diseases; encourage the farmers to adopt progressive farming practices by use of high value inputs and innovative technologies and help in stabilizing the farmers income particularly during disaster years besides facilitating on-account payment of compensation upto 25% sum insured. Food crops, Oil seeds, Annual Commercial and Horticulture Crops are covered under this scheme. All farmers including share croppers, tenant farmers, farmers enrolled under contract

farming directly or through promoters/organizers, group of farmers/societies serviced by fertilizer companies, pesticide firms, crop growers associations and self help groups, Non-Governmental organizations and others growing the notified crops in the notified areas are eligible for coverage. The risk covered includes sowing to harvest of the standing crop and post harvest losses.

The premium structure would be worked out with the discount provision on the premium in respect of the unit area where all farmers have adopted better water conservation and sustainable farming practices for better risk mitigation.

Premium Slab	Subsidy by Central and State Government on 50:50 basis and premium payable by farmers
Upto 2%	Nil
> 2 - 5%	40% subject to minimum net premium of 2%
>5 - 10%	50% subject to minimum net premium of 3%
>10-15%	60% subject to minimum net premium of 5%
>15%	75% subject to minimum net premium of 6%

However, premium rates are capped at 11% and 9% (of sum insured) for food & oil seed crops of Kharif and Rabi seasons respectively and 13% for annual commercial / horticultural crops. In case of crops where premium is higher than the cap level, then the sum insured will be reduced in proportion to cap level. Yield estimation under this scheme would be at village level in Cuddalore, Sivagangai & Namakkal and at firka level in all other districts except Chennai.

5.6.2.2. Component II : Coconut Palm Insurance Scheme

Coconut Palm Insurance Scheme was introduced on a pilot basis in 11 districts during 2011-12 and is now implemented in all the districts with the objectives to provide

insurance coverage against natural and other perils, provide timely relief against income loss, minimize risks and encourage replanting and rejuvenation. This scheme which was hitherto implemented separately will now be implemented under the new National Crop Insurance Programme.

Healthy nut bearing coconut palms grown as mono or intercrop, on bunds, farms or homestead and all varieties of coconut (Tall varieties of 7 to 60 years and Dwarf & Hybrids of 4 to 60 years) are insured. Individual farmers / growers cultivating atleast 5 healthy nut bearing palms in contiguous area / plot are eligible for enrolment.

Sum Insured and Premium

Coconut Palm age in years	Sum Insured Per Palm (Rs.)	Premium Per Palm Per Year (Rs.)
4 to 15	900	9.00
16 to 60	1750	14.00

Subsidy pattern for premium

CDB (%)*	STATE GOVT (%).	FARMER (%)
50	25	25

* Coconut Development Board

5.7. Coconut Development Board Assisted Schemes

Coconut plays a significant role in the agrarian economy of the state since it is an integral component even in the homestead system of farming. Being a perennial crop, Coconut earns income to the farmers throughout the year. Government is taking meticulous efforts to take up coconut cultivation in a remunerative manner by demonstration & adoption of location specific innovative technologies, effective mechanisation, plant protection and value addition. The schemes of Coconut Development Board aim at increasing the production and distribution of quality planting material, creating production potential by bringing more area

under coconut and improving the production & productivity of existing coconut holdings through an integrated approach thereby increasing the net income from unit holdings. Under this scheme, Quality 'Tall x Dwarf ' and 'Dwarf x Tall' coconut seedlings are produced in the Navlock Coconut Nursery, Vellore district and distributed to the farmers besides carrying out activities such as strengthening of Regional Coconut Nurseries and conducting demonstrations to popularize scientific management techniques to increase coconut productivity.

An extent of 82.66 acres of land has been identified in Dhali village in Udumalpet taluk of Tirupur district and handed over to the Coconut Development Board on a lease agreement for 33 years for establishing **Demonstration cum Coconut Seedling Production Farm** to demonstrate improved production technology to the Coconut growers besides ensuring production of adequate high yielding seedlings for distribution to the farmers.

Every year, around 3.20 Lakh coconut seedlings are distributed. During 2013-14, an amount of Rs.2.16 Crores has been spent towards the distribution of coconut seedlings, strengthening of coconut nurseries and laying out of demonstration plots. The scheme will be continued during 2014-15.

6.0. Externally Aided Projects

6.1. TN-IAMWARM PROJECT – Irrigated Agriculture Modernization and Water Bodies Restoration and Management (IAMWARM) Project

As Tamil Nadu is a water starved State, the Government is taking several initiatives like creation of farm ponds, check dams for effective rain water harvesting for improving the underground water table besides "More crop per drop of water" through increased water use efficiency. Government with an aim to increase the irrigated area, improve the crop productivity and farmers' income have

strengthened and integrated institutional structures under IAMWARM which can help farmer's access to irrigation management and improved agricultural practices. The project is implemented with the assistance of World Bank to improve water resources in 61 selected sub basins through Water Resources Organization by integrating the activities of departments of Agriculture, Horticulture, Agricultural Engineering, Agriculture Marketing & Agri Business, Animal Husbandry, Fisheries and Tamil Nadu Agricultural University.

An amount of Rs.108 Crores was allotted to Agriculture Department for implementation of the following Project activities.

- **Crop Demonstrations:** Demonstrations were conducted in Greenmanure-SRI-Rice Fallow Pulses, SRI-Rice Fallow Pulses, Modified SRI, Semi Dry Rice, Semi Dry Rice-Rice Fallow Pulses, Maize, Ragi, Pulses, Groundnut, Coconut, INM and Vermicompost (Silpaulin).
- **Distribution of Agricultural Implements:** SRI implements such as Conoweeder & Marker and Pulses Line Marker were distributed at 100% subsidy for demonstrations; Hand operated sprayer and power operated sprayers were distributed to the farmers in the sub-basin areas at 50% cost.
- **IEC / CB activities:** Farmers training, agricultural labourers training, exposure visits, capacity building and publicity propaganda activities were carried out.
- **Up-scaling of 400 Model Villages** in 17 Districts were carried out through 5 Ha. Crop Demonstrations for SRI, Maize and Pulses @ Rs.10,000/- per Ha. IEC / CB Programmes; Engaging / Deploying ATMA Volunteer (Farmers Friend) and Workshops, Trainings, etc.

During 2013-14, IAMWARM Project was implemented in 61 selected Sub-basins:

Phase & Year of implementation	Finance (Rs. in crores)	
	Sanctioned	Achmt
Regular Phase – IV (2) Amaravathy (2nd year)	4.187	3.040
Additional Activities – 3	2.870	2.485
Up-scaling of 400 Model Villages	2.730	2.191
Total	**9.787**	**7.716**

The project comes to closure by September 2014. During 2014-15, activities will be carried out to increase the area and production of millets and minor millets(Additional Activities – 4) besides taking up exposure visits to learn innovative irrigation management practices etc., at a cost of Rs.10.35 Crores.

The Cumulative financial progress of the project from 2007–08 to 2013-14 is as follows:

(Rs. in Crores)

Sub-basins	Target	Achievement
Phase – I (9 sub-basins)	15.70	15.53
Phase–II (16 sub-basins)	6.64	6.60
Phase–III(30 sub-basins)	25.99	25.35
Phase–IV (5 sub-basins)	12.05	10.26
Phase – IV–2 (Amaravathy Sub-basin)	7.67	6.33
Additional Activities – 1	20.37	19.85
Additional Activities – 2	7.07	6.85
Additional Activities – 3	3.50	3.04
Model Villages Activities	2.73	2.19
Total	**101.72**	**96.00**

2. HORTICULTURE

1. Introduction

Horticulture is a growth engine for Agriculture sector and the way to attain nutritional security in the state. The population of Tamil Nadu has increased from 62.41 million to 72.14 million in last decade which necessitates increasing the production of horticulture crops to meet the growing nutrition demand.

Consumption rate of fruits and vegetables is showing an upward trend because of greater awareness among the people on healthy diet and also increase in purchasing power. This necessitates the farmers to make a shift from traditional farming to commercial cultivation of horticulture crops. The contribution of horticulture produce in the State's Gross Domestic Product is very significant.

The varied agro climatic conditions favour the cultivation of extensive array of Horticulture crops. Population explosion and increase in urbanization in Tamil Nadu leads to shrinking of cultivable area. Hence it is necessary for effective utilization of available land and greater efforts had been put forth for enhancing the productivity. The Policy focus of the Government is as follows.

2. Policy Focus

- Achieving food security through doubling the production using hi-tech cultivation of horticulture crops.
- Tripling the income of the farmers through forward linkage and ensuring quality life

- Introduce organic farming for better soil health and human health.
- Focus on formation of farmer's clusters and empowerment.
- Thrust on rain fed area development.
- Thrust on Post-harvest, market-led management Technology.
- Extension of horticulture farming in urban sectors.
- Modernisation of the department farms/parks and gardens.

3. Strategies

- Area expansion and hi tech cultivation practices in horticulture crops.
- Use of High yielding varieties and quality pedigree planting material.
- Ensure timely supply of inputs.
- Increased water use efficiency and fertilizer use efficiency through mass adoption of Micro-Irrigation with Fertigation
- High tech horticulture by promotion of Precision Farming, High density planting, Protected cultivation.
- Thrust on Integrated Crop/Nutrient Management.
- Thrust on Integrated Pest and Disease Management.
- Canopy Management and senile orchards rejuvenation
- Promotion of Roof top cultivation of horticulture crops in urban areas.
- Improved Horticulture farming practices in rain fed areas to increase productivity of rainfed horticulture crops.
- Strengthening and modernization of infrastructure facilities for production of quality Pedigree Planting materials.