# EVALUATION OF HORTICULTURAL DEVELOPMENT PROGRAMME INCLUDING ORGANIC FARMING WITH SPECIAL REFERENCE TO NATIONAL HORTICULTURE MISSION FOR INCREASING FARM INCOME

Compared to field crops horticultural crops offer wider scope for income increase to farmers. They are also amenable for higher value addition. Greater employment opportunities coupled with higher remuneration is an incentive to go in for horticultural crops. However the flip side is that they are highly resource intensive, perishable and seasonal in nature. Storability is limited and need special arrangements like cold storage with higher levels of investments, normally not affordable by farmers. Yet, growing income levels of Indian population and increasing awareness of nutritional requirements have led to a gradual increase in the demand for horticultural crops.

Tamil Nadu is one of the prospering states with higher scopes for horticultural crops. Tamil Nadu state is situated at the South-eastern extremity of the Indian peninsula and comprises 30 districts (including Chennai) as shown in Fig.1

Fig. 1 District-wise map of Tamil Nadu


The state can be divided into seven agro climatic zones viz., Western, Southern, North Eastern, North Western, Delta, High Rainfall, and Hilly and Tribal zones. Tamil Nadu has a rich diversity of horticultural crops viz., tropical, subtropical and temperate crops due to the presence of seven agro ecological regions each having a unique microclimate suitable for select crops. Moreover, there are areas with temperate climate (above2000m), subtropical climate (1000 -2000m), humid tropical climate (500-1000m) and tropical climate

(upto 500 m) thereby making it possible for the production of various horticultural crops. Nearness to the equator and the presence of long stretch of Western Ghats, discontinuous Eastern Ghats and presence of hills and hillocks in the plains help moderation of climate to ensure the required temperature for growing different kinds of horticultural crops.

Fruits, vegetables, root and tuber crops, flowers, ornamental plants, medicinal and aromatic plants, spices and condiments, plantation crops and mushrooms, etc. form a significant part of the total agricultural produce in the State. Agriculture contributes 12% of the State GDP, while the share of Horticulture to State GDP is estimated at 3.5%. The net sown area is 36% of the total Geographic area (National average of 46%). The Gross cropped area is 53.2 lakh ha with a cropping intensity of 115. Irrigation covers 46% of the cropped area and the remaining 54% is rainfed. The area under Horticulture was 10.76 lakh Ha (15.5% of the total cultivable area in the State), with an annual production of nearly 188 lakh tonnes in 2010-11. In 2007-08 horticulture crops had been cultivated in 9.28 lakhs ha with an annual production of 162.03 lakh metric tonnes. During 2008-09, horticulture crops had been cultivated in 9.86 lakhs ha with an estimated annual production of 161 lakh metric tonnes. During 2009-10, it was cultivate horticulture crops in an area of10.25 lakh ha and steps were being taken to achieve a production of nearly 174 lakh metric tonnes (Table:1).

Tamil Nadu has great potential for development of horticulture as a commercial venture. Tamil Nadu has a long coastal belt suitable for plantation crops like cashew and cut flowers like tropical orchids. The southern part of Tamil Nadu has potential for growing off season mangoes and grapes. At National level, Tamil Nadu ranks 1st in area under banana and flowers. Tamil Nadu stands 1st in the production of flowers and Tapioca and productivity for Tapioca and cabbage. Horticulture department has been strengthened with adequate staff to cater to the needs of farmers. The district is headed by a Deputy Director. Under his control the block is headed by an Assistant Director of Horticulture with Horticulture Officers and Assistant Agriculture Officers. The staff strength has been increased from 1191 to 2599 in the Technical wing and 752 Nos. to 1158 Nos. in the Non Technical wing. This restructuring has provided growth opportunities for the staff and a record number of staff has been promoted this year. This is unprecedented in recent times.

**Production strengths of Tamil Nadu in Horticulture**

Tamil Nadu accounts for nearly 6% of the area under fruits and 4% of the area under vegetables in the country. In terms of production, the State's share is nearly 10% in fruits and 6% in vegetables. Tamil Nadu is also a leading state in production of flowers. The total production of horticultural crops is nearly 188 Lakh ha during 2010-11

**Table: 1. Area, Production and Productivity of Horticultural crops**

| Crop | Area (lakh ha.) | | | | | Production (lakh MT) | | | | | Productivity ( MT/Ha.) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007-08 | 2008-09 | 2009-10 | 2010-11 | % share | 2007-08 | 2008-09 | 2009-10 | 2010-11 | % share | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
| Fruits | 2.8 | 2.95 | 3.07 | 3.19 | 30 | 67.78 | 68.03 | 73.05 | 79.35 | 42 | 24.21 | 23.06 | 23.79 | 24.87 |
| Vegetables | 2.44 | 2.52 | 2.63 | 2.84 | 26 | 76.61 | 71.86 | 77.62 | 83.82 | 45 | 31.40 | 28.52 | 29.51 | 29.51 |
| Spices and condiments | 1.4 | 1.54 | 1.6 | 1.66 | 15 | 7.39 | 8.63 | 9.32 | 10.07 | 5 | 5.28 | 5.60 | 5.83 | 6.07 |
| Plantation Crops | 2.31 | 2.46 | 2.55 | 2.66 | 25 | 7.98 | 9.85 | 10.63 | 11.49 | 6 | 3.45 | 4.00 | 4.17 | 4.32 |
| Flowers | 0.08 | 0.1 | 0.1 | 0.1 | 1 | 0.18 | 0.48 | 0.51 | 0.55 | 0 | 2.25 | 4.80 | 5.10 | 5.50 |
| Medicinal and aromatic Plants | 0.25 | 0.29 | 0.3 | 0.31 | 3 | 2.09 | 2.56 | 2.77 | 2.99 | 2 | 8.36 | 8.83 | 9.23 | 9.65 |
| Total | 9.28 | 9.86 | 10.25 | 10.76 | 100 | 162.03 | 161.41 | 173.9 | 188.27 | 100 | 17.46 | 16.37 | 16.97 | 17.50 |

Source - Indian Horticulture Board

**Table 2 - Production strengths of Tamil Nadu**

| | Area ( lakh Ha) | Production (lakh MT) | Share (%) | | All India Rank | |
|---|---|---|---|---|---|---|
| | | | Area | Production | Area | Production |
| Total Fruit | 3.19 | 79.35 | | | 7 | 3 |
| Mango | 1.46 | 8.24 | 46 | 10 | 6 | 8 |
| Banana | 1.25 | 62.53 | 39 | 79 | 1 | 2 |
| Others | 0.48 | 8.58 | 15 | 11 | | |
| Vegetables | 2.84 | 83.83 | | | 10 | 5 |
| Tapioca | 1.34 | 55.23 | 47 | 66 | 2 | 1 |
| Onion | 0.34 | 5.15 | 12 | 6 | 4 | 5 |
| Tomato | 0.26 | 5.61 | 9 | 7 | 7 | 10 |
| Brinjal | 0.12 | 2.35 | 4 | 3 | | |
| Drumstick | 0.08 | 4.81 | 3 | 6 | | |
| Ladies finger | 0.07 | 0.72 | 2 | 1 | | |
| others | 0.63 | 9.96 | 22 | 12 | | |
| Plantation crops | 2.66 | 11.49 | | | | |
| Cashew | 1.18 | 0.72 | 44 | 6 | | |
| bamboo | 0.01 | 0.014 | 0.4 | 0.1 | | |
| cocoa | 0.02 | 0.03 | 0.8 | 0.3 | | |
| others | 1.45 | 10.72 | 55 | 93 | | |
| | | | | | | |

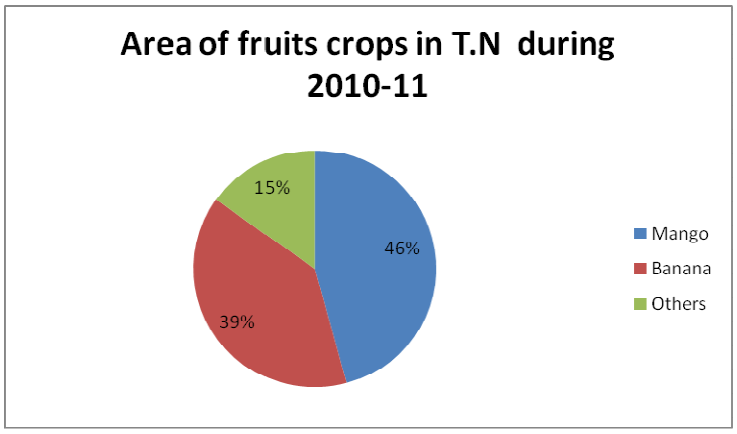
Source: NHBD Data base

**Production of various Horticultural crops**

**A) Fruits**

Mango and Banana are the leading fruit crops in Tamil Nadu accounting for over 85% of the area under fruit and over 88 %of the total fruit production. Off-season production of mango and round the year production of grapes is unique to Tamil Nadu.

**Fig.3 (A) - Fruit (Area and Production)**



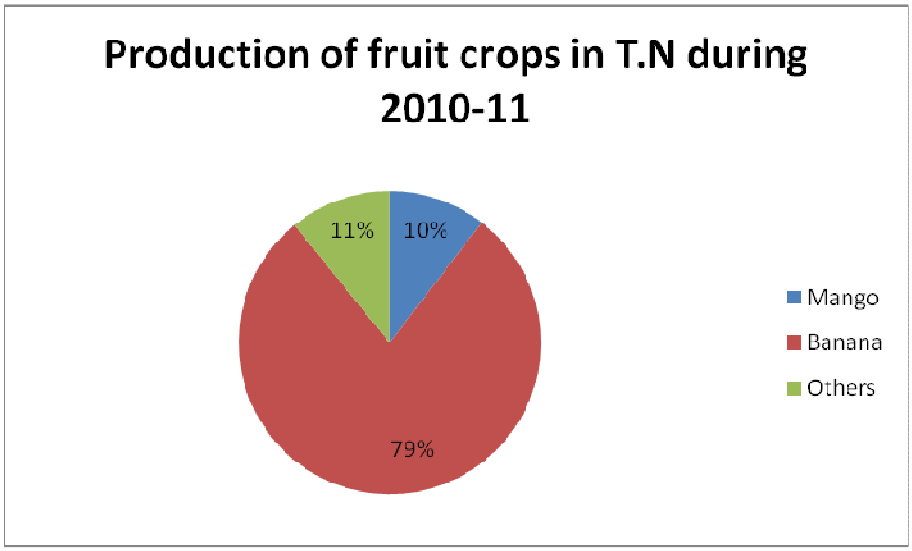
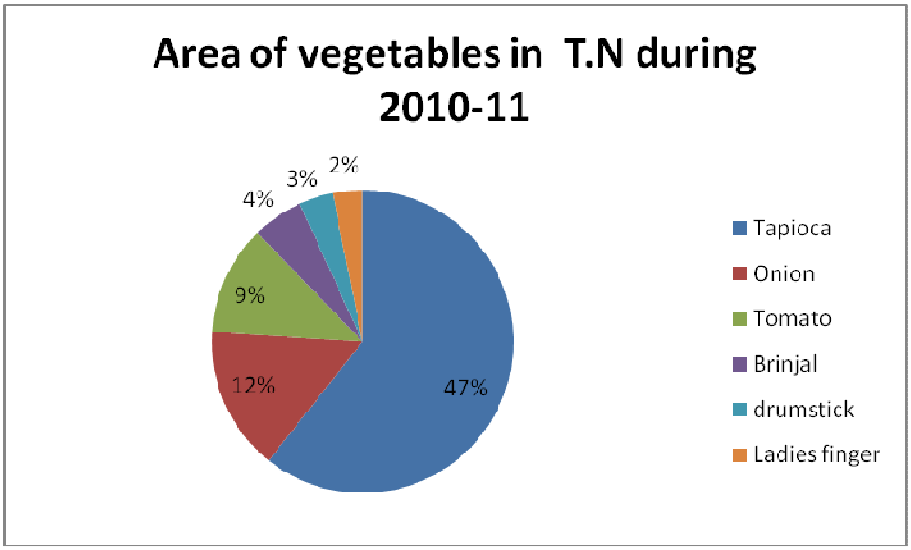



**Table 3. Fruit (Main Production areas)**

| FRUIT | MAIN PRODUCTION AREAS |
|---|---|
| Banana | Thiruchirapalli, Thoothukudi, Thirunelveli, Pudukottai, Thanjavur |
| Mango | Krishnagiri, Vellore, Dindigul, Theni, Dharmapuri, Madurai |
| Sapota | Thirunelveli, Erode, Karur |
| Grapes | Theni, Coimbatore |
| Guava | Madurai, Dindigul, Vellore, Virudhunagar |
| Aonla | Thirunelveli, Sivagangai, Thoothukudi, Coimbatore, Dindigul, Erode |

**B) Vegetables**

The main vegetables grown in Tamil Nadu are Tapioca, onion,Tomato, Brinjal , okra and drum stick. These account for over 87 % of the total area as well as the production of vegetables.



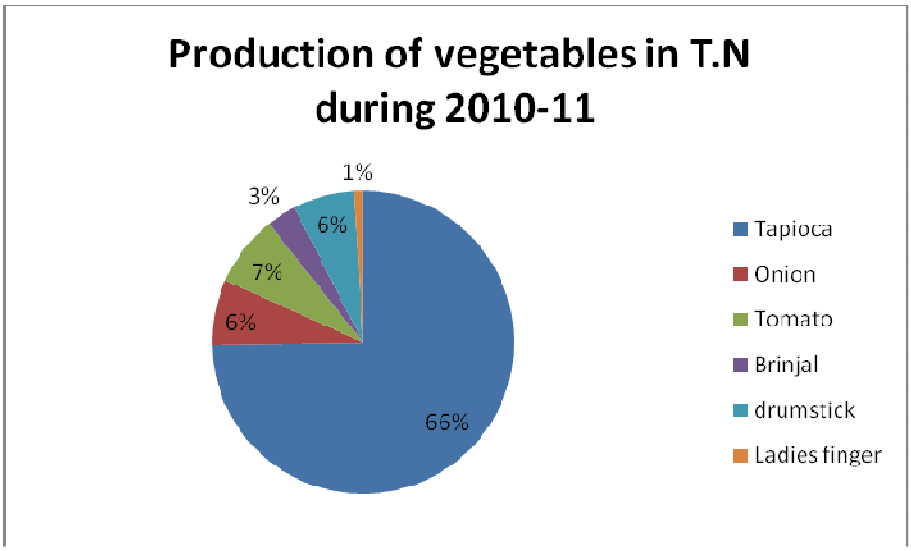



**Table 4. Vegetables (Main Production areas)**

| VEGETABLE | MAIN PRODUCTION AREAS |
|---|---|
| Tapioca | Namakkal, Salem, Dharmapuri |
| Drumstick | Thoothukudi, Dindigul, Karur |
| Tomato | Coimbatore, Dharmapuri, Salem, Krishnagiri |
| Onion | Perambalur, Thiruchirapalli, Namakkal, Dindidul |
| Brinjal | Vellore, Kanchipuram, Theni, Coimbatore |
| Cabbage | Nilgiris, Krishnagiri, Dindigul |
| Potato | Nilgiris, Dindigul |
| Bhendi | Kancheepuram, Vellore, Dindigul |

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**C) Spices**

The main spices grown are Chillies, Coriander, Tamarind, Turmeric and Curry leaves

**Table 5. Spices (Main Production areas)**

| SPICES | MAIN PRODUCTION AREAS |
|---|---|
| Curry Leaves | Coimbatore, Salem, Thoothukudi |
| Turmeric | Erode, Coimbatore, Salem |
| Coriander | Cuddalore, Perambalur, Virudhunagar |
| Chillies | Ramanathapuram, Thoothuukudi |
| Tamarind | Dindigul, Theni, Coimbatore, Madurai |

**D) Flowers**

The main flowers grown in Tamil Nadu are Jasmine, Mullai, Chrysanthemum, Marigold and Rose

**Table 6. Flowers (Main production areas**

| FLOWER | MAIN PRODUCTION AREAS |
|---|---|
| Jasmine | Madurai, Thirunelveli, Erode, Dindigul |
| Mullai | Vellore, Coimbatore, Cuddalore |
| Marigold | Thiruchirapalli. Theni, Dindigul, Karur |
| Rose | Krishnagiri, Dindigul, Dharmapuri |
| Chrysanthemum | Krishnagiri, Dharmapuri, Salem |

**Consumption of Horticultural products in Tamil Nadu**

The consumption of Fruits and Vegetables is growing at a faster rate as compared to other food products as seen in Table 7

**Table 7 - Consumption of Food Products in Tamil Nadu (Rs. Crores) - at 1993-94 prices**

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | CAGR |
|---|---|---|---|---|---|---|---|---|
| Cereals, gram | 6289 | 7130 | 6626 | 7243 | 7293 | 7259 | 7212 | 2% |
| Pulses | 1189 | 1379 | 1453 | 1868 | 1720 | 1749 | 1748 | 7% |
| Milk & milk products | 1561 | 2372 | 2305 | 2727 | 2728 | 2626 | 2880 | 11% |
| Edible oil | 1134 | 1240 | 1189 | 1379 | 1306 | 1483 | 1 725 | 7% |
| Meat, egg, fish | 1225 | 1619 | 1555 | 2068 | 2246 | 2268 | 2247 | 11% |
| Vegetables | 1514 | 1922 | 1921 | 2771 | 2501 | 2692 | 2846 | 11% |
| Fruits(fresh) | 466 | 719 | 621 | 1047 | 921 | 902 | 994 | 13% |
| Fruits(dry) | 17 | 40 | 21 | 53 | 73 | 82 | 73 | 28% |
| Sugar | 377 | 514 | 496 | 599 | 609 | 582 | 605 | 8% |
| Salt | 57 | 70 | 62 | 90 | 86 | 83 | 88 | 8% |
| Spices | 927 | 1163 | 1092 | 2512 | 1465 | 1460 | 1493 | 8% |
| Beverage etc. | 1997 | 2453 | 2556 | 3604 | 4003 | 4435 | 4364 | 14% |
| FOOD TOTAL | 16752 | 20623 | 19900 | 25962 | 24950 | 25622 | 26274 | 8% |

Source - NSSO data

**Plan Schemes**

Enabling policy environment and appropriate fiscal incentives can go a long way in promoting optimal development of horticultural sector in the State. To this end the State as well as Central Governments have formulated several specific schemes to promote orderly development of different segments of the horticultural sector in Tamil Nadu.

**Tamil Nadu Horticulture Development Agency (TANHODA)**

Tamil Nadu Horticulture Development Agency has been registered as a Society under Tamil Nadu Societies Registration Act, 1975. The Governing Council of the Society consists of the Chairman, Managing Director, and six official members. TANHODA has been conceived as a *"Special Purpose Vehicle"* for the purpose of implementing schemes like National Horticulture Mission, Micro Irrigation, and National Bamboo Mission. TANHODA is implementing the following schemes National Horticultural Mission, Micro-irrigation scheme, National Bamboo mission, TN – IAMWARM and supports State Horticulture Farms.

**Restructuring of the departments and strengthening of TANHODA**

The Government of Tamil Nadu, has taken pro-active steps to strengthen TANHODA so as to enable it to discharge its duties. TANHODA has been strengthened by inducting one Additional Director for NHM, 3 Joint Directors one each to look after IAMWARM, Micro Irrigation and Bamboo Mission, and State Horticultural Farms.

**State Horticulture Farms**

The salary of the existing staff in the Horticulture Farms shall be borne by Government. The receipts from State Horticulture Farms by way of sale of planting material and usufructs will be credited to the TANHODA account. TANHODA shall prepare annual plans and budgets and make available funds for maintenance, infrastructure development & for day-to-day expenses of inputs, wages, electricity and other contingencies. An amount in the form of revolving fund will be given as one-time-grant to TANHODA.

**Centrally Sponsored Schemes**

**National Horticulture Mission (85:15)**

The scheme is implemented in 20 districts viz Coimbatore, Erode, Salem, Dharmapuri, Krishnagiri, Cuddalore, Madurai, Theni, Dindigul, Trichy, Tirunelveli, Sivagangai, Ramanathapuram. Nilgiris, Perambalur, Vellore, Pudukottai, Villupuram, Kanyakumari and Thanjavur. The Scheme covers the crops viz Mango, Aonla, Banana, Cashew, Cocoa, Chillies, Turmeric, aromatic plants and flowers which are promoted through a cluster approach. The scheme was implemented during the year 2007-08 with a financial outlay of Rs.7576 lakhs and implemented during 2008-09 with a financial outlay of Rs.12000 lakhs. The scheme is implemented through District Mission Committees headed by the District Collectors and Deputy Director of Horticulture of the district is the member Secretary of the committee.

**Micro Irrigation Scheme**

With increasing demand on water from various sectors, the availability of water is under severe stress. Agriculture sector is the largest user of water. While irrigation projects (Major and medium) have contributed to the development of water resources, conventional methods of irrigation are inefficient and lead to wastage of water. It has been recognized that the use of modern irrigation methods like drip and sprinkler irrigation are the ways for the efficient use of surface as well as ground water resources.

Under this scheme subsidy of 50% is given to farmers who install drip or sprinkler systems in their fields. The department of Agriculture is the nodal agency for Coconut and sugar cane in private sugar mills. The Department of Sugar is the nodal agency for sugar cane in the co operative sugar mills. Agricultural Engineering Department is responsible for fruit tree crops and the department of horticulture for vegetables, flowers, spices, medicinal plants and banana.

The drip irrigation companies were selected and empanelled in the year 2007-08. With the restructuring of the department and provision of adequate staff this scheme is expected to take off. During the year 2007-08, micro irrigation scheme was implemented with a financial outlay of Rs.6811 lakhs for an area of 12621 hectares.During 2008-09, the scheme will be implemented in an area of 38000 ha. under Horticultural crops and non-horticultural crops at an approximate cost of Rs. 9000 lakhs.

**Schemes Fully Funded by Government of India**

**Bamboo Mission in Tamil Nadu**

Bamboos are a fast growing species. Bamboo is a much preferred material because of its qualities and cheaper cost, in sectors like pulp wood industries, housing, arts, crafts etc. Bamboo is estimated to have about 1500 uses. For this scheme, an amount of Rs. 258.32 Lakhs has been allotted for the year 2007 08. The scheme is being implemented through departments of Horticulture, Agriculture, Forest and Tamil Nadu Agricultural University. Tamil Nadu Horticultural Development Agency (TANHODA) is the nodal agency for National Bamboo Mission Scheme. In Tamil nadu, Bamboo is cultivated in an extent of 1000 ha in non forest area.

During the year 2007–08, an area of 200 ha is brought under bamboo cultivation at 50% subsidy. During the year 2008–09, 750 ha will be brought under cultivation. During the year 2007–08, 200 farmers have been trained in Bamboo Cultivation at Forest College

Mettupalayam**.** During the year 2008–09, 2300 farmers will be trained under advanced technology bamboo cultivation.

**Externally Aided Project**

**IAMWARM PROJECT**

The objective of the scheme is to bring Crop Diversification and Area Expansion with high income-generating horticultural crops, in 63 river sub basins ofTamil Nadu. During the year 2007-08, the 1st Phase of implementation has been taken up in 9 sub-basins viz., Varahanadhi, Upper Vellar, South Vellar, Pambar, Manimuthar, Kottakkaraiyar, Arjunanadhi, Palar and Aliyar. During the year 2007-08 an area of 4310 Ha has been covered against the target of 6139 ha. An expenditure of Rs.320 lakhs has been achieved against the target of Rs.858.120 lakhs.

The Project will be extended in the 2nd Phase to another 16 sub-basins during 2008 09 viz., Pennaiyar (up to Krishnagiri), Swethanadhi, Anaivari Odai, Chinnar, Agniar, Ambuliyar, Upper Vaigai, Varattar-Nagalar, Upper Gundar, Therkar. Senkottaiyar, Sindapalli-Uppodai, Nishabanadhi, Kalingalar, Poiney and Koundinyanadhi. Besides providing planting materials, inputs and development of irrigation infrastructure like Drip & Sprinklers, Marketing facilities, etc will be made available to the farmers by convergence with line-departments.

**Table 8. Progress of Schemes implemented by TANHODA**

Physical : ha. Financial: Rs. in lakhs

| **Sl. No.** | **Name of the Scheme** | **2007-08** | | | | **2008-09** | |
|---|---|---|---|---|---|---|---|
| | | **Phy.** | | **Fin.** | | **Phy.** | **Fin.** |
| | | **Tar.** | **Achmt. as on 29.02.08** | **Tar.** | **Achmt. as on 29.02.08** | **Tar.** | **Tar.** |
| 1 | Micro- Irrigation | 34382 | 13597 | 6811 | 1463 | 38000 | 9000 |
| 2 | National Horticulture Mission | 30920 | 35514 | 9800 | 4843 | 40000 | 12000 |
| 3 | TN IAMWARM | 6139 | 4310 | 858.120 | 315.000 | 6375 | 886 |

**State Horticulture Farms**

There are 51 State Horticulture Farms and 4 parks under the control of TANHODA. 1083 labourers of State Horticulture Farms who had put in more than 10 years of service were made permanent on 29.11.2007 with time scale of pay. Pedigree planting materials are being produced from these State Horticulture Farms and distributed to the horticultural crop-cultivating farmers under various schemes. They also serve as *"Model Demonstration Farm"*

to the local growers. The Botanical Garden and Parks serve as *"Study Centers"* for the students and attract many tourists.

During the year 2007-08, as on 29.02.2008,75 lakh nos. of planting materials were produced in State Horticulture Farms and distributed to farmers. During 2008-09, it is programmed to produce 115 lakhs Nos. of planting materials of various kinds.The details of State Horticulture Farms are furnished in the Table - 8

**Protected poly green house cultivation**

The floriculture had emerged as high tech culture during in early 200s. rose growing dominated the scene. Slowly carnations, gerbera and liliums gained entry. Now a day's Nilgiris has become the bowl of carnations. HOSUR has become cut flower capital of Tamil Nadu. At present, technologies for green house cultivation of capsicum, tomato, sweet potato, sweet pepper, cucumber and beans are made available. The poor quality planting material decreased the productivity and made the industry unviable. Capacity building or hands on training in the latest state of art technologies for farmers as well as extension workers are lacking**.** The National Horticulture Mission of the Horticulture Department provide subsidy for the Hitch practices of cultivation of vegetables and flowers under protected cultivation.

**Table 9. Performance of the Schemes during 2007-2011** Unit: Area 1000 sq. mt. – 1 unit.

| Sl. No. | Scheme | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | Total | Plan for 12th FYP |
|---|---|---|---|---|---|---|---|---|
| **I** | **National Agriculture Development Programme** | | | | | | | |
| 1 | Hi-Tech Productivity | - | - | - | - | 100 | 100 | 200 |
| 2 | Rainfed Area Development Programme | - | - | - | - | 20 | 20 | 100 |
| 3 | Peri-Metro Vegetable Cluster Development Programme | - | - | - | - | 54 | 54 | 250 |
| **II** | **National Horticulture Mission** | 312 | 464 | 386 | 291 | 400 | 1853 | 2000 |
| | **Total** | **312** | **464** | **386** | **291** | **574** | **2027** | **2550** |

**Precision Farming System**

Cultivation protocol in which all the cultural operations are undertaken very accurately

Key steps chisel ploughing, transplanting young seedling, adopting recommend spacing and installing drip and fertigation

50% subsidy limited to Rs.20000/ha

Critical inputs-seeds, water soluble fertilizer

Training is imparted to beneficiary farmers
60% to 80% higher yield in all horticulture crops
High quality first grade marketable produce
Better returns to farmer

An innovative precision farming project was contemplated for the Dharmapuri district during 2004-05 in 400 ha with an objective to promote rural farm economy. Tamil Nadu Agricultural University had implemented the projection on turn-key mode and empowered the farming community technically, economically and socially. The Farmer First approach, cluster level associations, incorporation of producer companies and better linkage with market were the key elements of success. Compared to the state and national average yields of crops, the yield of crops under precision system has doubled in 45 crops. The input use efficiency, water use efficiency and technology use efficiency were all time high. The peasant farmers have incorporated the Producer Company Ltd., both for sale of inputs as well as to market their produce. The project was scaled up to 55,000 ha under NADP (RKVY) and IAMWARM subsequently. The TN state has contemplated 40,000ha during this year across the state. The productivity increase, improvement in quality of the produce, increase in income levels, marketing efficiency, negotiating and bargaining power of the farmers, reduced cost of cultivation, retention of soil fertility, water saving, energy saving, enhanced confidence level of the farmers, proficiency of farmers in adopting the high tech cultivation systems, etc have made the project as farmer driven rather than subsidy driven.

On taking up a detailed analysis for this productivity status, the Government of Tamil Nadu introduced Precision farming as a technology to improve productivity of horticulture crops using integrated crop management practices. Cluster formation, Soil and Water analysis; Chisel ploughing, Quality planting material, Micro Irrigation with fertigation and adoption of integrated crop management practices are key components of this programme. An extent of 22294 ha has been brought under precision farming from 2008 to 2010-11.

This programme has been implemented with very encouraging results. An area of 22294 ha. have been covered in 24 districts and 1238 clusters have been established. The following vegetables have been grown and their productivity has shown substantial increase. Under this programme 24252 farmers have obtained increased yields. The crop wise productivity increase is as under:

**Table 10. Crop Wise Productivity Increases under Precision Farming**

| Sl. No. | Crop | Normal Yield (T/ha.) | Scheme Yield (Y/ha.) | Productivity Increase (T/ha.) | Percentage Increase |
|---|---|---|---|---|---|
| 1 | Brinjal | 25 | 45 | 20 | 80% |
| 2 | Banana | 50 | 90 | 40 | 80% |
| 3 | Ribbed gourd | 14 | 25 | 11 | 78% |
| 4 | Tomato | 30 | 55 | 25 | 83% |
| 5 | Onion | 12 | 20 | 8 | 66% |
| 6 | Beet Root | 20 | 40 | 20 | 100% |
| 7 | Cauliflower | 25 | 40 | 15 | 60% |

The quality of produce is consistently better and fetches remunerative prices which are higher than those obtained through traditional cultivation practices. The details of increased price realization from Coimbatore market is as presented in table 11. The impact study analyzed 1116 farmers from Coimbatore district and it was found that these farmers have used their surplus for various purposes. Large numbers of farmers have found that technology makes farming remunerative and viable. This scheme has brought about various socio-economic changes in the life of the farmers.

**Table11. Crop wise Price Realization for Precision Farming Produce**

| Sl. No. | Crop | Due to the Project |
|---|---|---|
| 1 | Brinjal | 9 – 15 |
| 2 | Banana | 10 – 12 |
| 3 | Ribbed gourd | 8 – 12 |
| 4 | Tomato | 8 – 20 |
| 5 | Onion | 10 – 20 |
| 6 | Beet Root | 8 – 15 |
| 7 | Cauliflower | 9 - 20 |

**Table12: Socio Economic Impact and Quality of Life**

| Sl. No. | Socio Economic changes observed | Percentage % |
|---|---|---|
| 1 | Improved the existing land | 13 % |
| 2 | Modified the existing house | 4 % |
| 3 | Purchased new consumer durables | 5 % |
| 4 | Had better nutritious food | 14 % |
| 5 | Spent more for food and clothing | 13 % |
| 6 | Better relations developed with scientists / Extension officials | 15 % |
| 7 | Organizational participation increased | 17 % |
| 8 | Increased saving | 19 % |
| | **Total** | **100 %** |

**Micro Irrigation**

Efficient utilization of irrigation water is the need of the hour. Micro irrigation paves way for it. Each drop of water is made productive in this technology. Uniform crop growth and produce size are achieved through this. Using Micro Irrigation more area can be brought under cultivation with less water. Drip and sprinkler irrigation are the latest Technology of Micro Irrigation in the XI Five Year Plan. To make it more productive, drip coupled with fertigation is enhanced

**Table13: Performance of micro irrigation in National Mission (Unit: Area in Ha.)**

| Sl. No. | Scheme | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | Total 11th FYP | Plan for 12th FYP |
|---|---|---|---|---|---|---|---|---|
| 1 | National Mission on Micro Irrigation | 7819 | 11597 | 18008 | 26153 | 8954 | 72531 | 203300 |

**Fertigation**

It is the method in which essential nutrients to plants are given through drip irrigation. By this method the nutrients are supplied at the root zone for easy absorption by plants and also there is less loss of nutrients. These nutrients in the form of water soluble fertilizers or liquid fertilizers are supplied in short and regular intervals as per the growth requirements of plants. By this technology, uniform crop stand and produce size are achieved. There is also the advantage of extended harvest period leading to higher yields. This Hi-Tech practice followed in both Agriculture and Horticulture Department to boost the production.

The Centrally sponsored Micro Irrigation Scheme was launched in 2005-06 in Tamil Nadu and its implementation however started from the year 2007-08 onwards in Tamil Nadu, The Government has designated the Tamil Nadu Horticulture Development Agency (TANHODA) as the nodal agency for the scheme. From 2007-08 onwards the Micro Irrigation scheme has been implemented in the state by the Tamil Nadu Horticulture Development Agency.

**Table14: Achievement of the scheme during 2007-08**

| Sl. No. | Year | Area (ha.) | Financial Achievement (Rs. In lakhs) | Number of Beneficiaries |
|---|---|---|---|---|
| 1 | 2007-08 | 7819 | 1593 | 5055 |
| 2 | 2008-09 | 11597 | 2718 | 8997 |
| 3 | 2009-10 | 18008 | 4659 | 14145 |
| 4 | 2010-11 | 26153 | 8364 | 23798 |
| | **Total** | **63577** | **17334** | **51995** |

**Mulching**

Mulching is a protective cover placed over the soil to retain moisture, reduce erosion, provide nutrients, and suppress weed growth and seed germination and reduce the cost of cultivation.

**Table15: Achievement of the scheme during 2007-11** (Unit: Area in Ha.)

| Sl. No | Scheme | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | Total 11th FYP | Plan for 12th FYP |
|---|---|---|---|---|---|---|---|---|
| 1 | National Horticulture Mission | 25 | 235 | 70 | - | 1000 | 1330 | 2000 |

**Tissue Culture**

**Plant tissue culture** is a practice used to propagate plants under sterile conditions, often to produce clones of a **plant**.

**Table15: Achievement of the scheme during 2007-11** (Unit: Area in Ha.)

| Sl. No | Scheme | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | Total 11th FYP | Plan for 12th FYP |
|---|---|---|---|---|---|---|---|---|
| 1 | National Horticulture Mission | - | - | - | 1599 | 2000 | 3599 | 4000 |

**High Density Planting**

High density planting is one of the most effective measures to increase productivity per unit area. This method is the one and the only efficient orchard management system, precocious (Early Bearing), easily manageable, high yield potential with higher returns per unit area and with more efficient way of harvesting radiant energy.

**Table15: Performance of the scheme during 2007-11 (Unit: Area in Ha.)**

| Sl. No. | Scheme | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | Total 11th FYP | Plan for 12th FYP |
|---|---|---|---|---|---|---|---|---|
| 1. | National Horticulture Mission | 0 | 0 | 0 | 5451 | 5250 | 10701 | 10000 |
| 2. | National Agriculture Development Programme | | | | | | | |
| | Hi-Tech Productivity Enhancement Programme | 0 | 0 | 0 | 500 | 1500 | 2000 | 2500 |
| | **Total** | **0** | **0** | **0** | **5951** | **6750** | **12701** | **12500** |

**Rejuvenation / Canopy Management**

The removal of unproductive branches of fruit crops through pruning and training enables the tree to produce more yields and maintains the manageable size. In order to build the capacity of the farmer to adopt advance technologies and to utilize the schemes implemented by the department district horticulture information and training center will be strengthened.

**Table16: Performance of the scheme during 2007-11** (Unit: Area in Ha.)

| Sl. No. | Scheme | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | Total 11th FYP | Plan for 12th FYP |
|---|---|---|---|---|---|---|---|---|
| 1. | **National Horticulture Mission** | 6169 | 3338 | 3963 | 4485 | 2500 | 20455 | 20000 |
| 2. | **National Agriculture Development Programme** | | | | | | | |
| I | Hi-Tech Productivity Enhancement Programme | 0 | 0 | 0 | 0 | 1500 | 1500 | 2500 |
| | **Total** | **6169** | **3338** | **3963** | **4485** | **4000** | **21955** | **22500** |

**Hi-Tech Nursery Management**

Horticulture plants are produced and multiplied through various technologies, which includes Grafting, Layering, Budding and different types of cuttings. Vigorous and healthy plants are produced by adopting Hi-Tech Nursery management practices.

In Tamil Nadu 55 Status Horticulture Farms are functioning. They produce pedigree planting materials by adopting latest Hi-Tech Nursery management practices. During the 11th plan period 623.68 Lakh No of plants were produced. During the 12th plan period is proposed to produce 892.54 lakh No of plants. Under NHM and National Bamboo Mission Establishment of Model Nursery and Small Nursery is supported by the Government. During the 11th plan period 106 No of Model nurseries were developed. During the 12th plan period, it is proposed to establish 125 No of Model nurseries and Small nurseries.

**Horticulture Schemes - State Plan**
**Precision Farming**

The Tamil Nadu Precision Farming Project was implemented over three years (2004-2007) in the districts of Dharmapuri and Krishnagiri in the northern part of Tamil Nadu. The rationale for selection of these two districts was primarily the socioeconomic status of both districts, which were considered to be backward, impoverished and water-scarce areas dominated by traditional agricultural practices. Further, Dharmapuri district is considered to

be " Horticultural district of Tamil Nadu": the largest producer of tropical, sub-tropical and arid zone fruit crops like mangoes, banana, papaya, sapota, guava and grapes, and vegetables such as, tomato, brinjal, chillies, cabbage, etc. About 10% of the floriculture industry in the state is concentrated in Hosur area of Krishnagiri district.

Precision farming seems to be a successful one, which is liked by the farmers. Mainly the cost of crop cultivation gets reduced by input saving, drip fertigation, adoption of need based plant protection measures, timely availability of technical guidance, follow up by the officials, water saving measures all put together increases the glory of the precision farming. From the survey finding, the farmers may be trained maintenance and management of drip units and in drip fertigation. The distance between the drip units may be maintained as 4 feet instead of 5 feet.

The project has grown in profile over the years, primarily as a result of its effectiveness in transferring a package of technologies as well as in the demonstrable benefits that the participating farmers have experienced from a transition to hi-tech farm management. This is reflected, for instance, in the generally increasing proportion of applications received in the second and third years as compared to the first year of the project. This is also mirrored in the number and profile of visitors to the PFP farms over the years (see appendix to this report).

The PF technologies were structured in a package that had to be internally consistent and were transferable *as a package* to beneficiary farmers. These were essentially of two types: cultivation related and post-harvest management. Notable precision technologies included drip irrigation using Class 3 fertigation units along with water soluble fertilizers (WSF), the use of community nurseries, use of remote sensing technologies to develop a fertigation schedule according to crop and soil type, grading and sorting techniques and detailed documentation of farm activities.

The PF technologies were made available to the beneficiary farmers through a progressively reducing financial assistance that included the cost of the fertigation equipment and the cost of installation (including the installation of laterals) and the cost of cultivation (including the cost of WSF). This entire cost package was estimated to be about Rs. 115,000. The level of assistance was reduced progressively over the years as follows in first 100% and second year 90 % and third year 80 %. Beneficiary farmers recruited in year 2 and 3 were expected to bridge the cost difference themselves.

As per the farmers liking, subsidy may be given for soluble fertilizer as of straight fertilizer. Further more water saving technologies may be taught. Since more number of farmers are willing to adopt precision farming, the scheme may be operated in larger area, covering more number of farmers. Crop based farmers interest groups, farmers federation may be made by the department / NGO's which will be helpful to the farmers to improve their economic status. The development of infrastructures like cold storage, collection centre, transport facility will reduce the farmers anxiety and induce them to produce more quality products of export standard.

**Integrated Horticulture Development Scheme**

Integrated Horticulture Development Scheme is being implemented in 31 districts of Tamil Nadu except Chennai. Area expansion under Horticultural crops with improved varieties is proposed to be taken up. Modern cultivation practices will be disseminated to farmers to enhance productivity. To increase the area under cultivation of vegetables and stabilize their prices, vegetable cultivation will be promoted with elite planting materials, high yielding / hybrid seeds of vegetables and flowers which are proposed to be distributed to farmers at 50% subsidised cost. It is proposed to cover an area of 50,000 ha. with an outlay of 1925.00 lakhs during 2011-2012.

**Horticulture Training Centres**

Horticulture Training Centers are functioning at Kudumianmalai, Madhavaram, Thally and Ooty. Hi-Tech cultivation is the key to enhance productivity of various horticultural crops. It is proposed to impart training to field functionaries on precision farming, high density planting, canopy management, protected cultivation, micro irrigation & fertigation, etc. with the aim of improving their skills. During 2011-2012, it is proposed to train 6400 farmers / field level functionaries with an outlay of 6.97 lakhs.

**Integrated Tribal Development Programme**

Under this scheme, vegetable seeds are being distributed to tribal farmers at 90% subsidized cost and planting materials, farm implements at 75% subsidized cost in Salem, Namakkal, Dharmapuri, Tiruvannamalai, Vellore, Trichy and Villupuram districts. Exposure visits and training programmes are being conducted in order to educate tribal farmers on improved technologies. During, 2011-2012 it has been proposed to implement this programme with an outlay of ` 40 lakhs.

**Western Ghats Development Programme**

It is proposed to distribute high yielding / hybrid vegetable seeds and planting materials at 50% subsidy cost to the farmers in Western Ghat Districts. Training on latest technologies will be given to the farmers. During 2011-2012, it has been proposed to implement this scheme with an outlay of ` 171 lakhs.

**Hill Area Development Programme**

Crop diversification from perennial crops to annual vegetable crops, value addition and mechanization of harvesting are the objectives of the programme. High yielding / hybrid vegetable seeds, oil engines, agricultural machineries/ implements like sprayer, power tiller, mini tractor etc. are proposed to be distributed under this scheme with a subsidy of 25-50%. During, 2011-2012 it has been proposed to implement the scheme with an outlay of ` 358.15 lakhs.

**City Vegetable Development Scheme**

Establishment of home and kitchen gardens will be promoted in Chennai and other cities. It is proposed to distribute planting materials, seeds, fertilizers and plant protection chemicals at full cost to establish home and kitchen gardens. Training and technical advice will be provided to the residents to maintain their home and kitchen gardens. During 2011-2012 it is proposed to implement this scheme with an outlay of ` 3.50 lakhs.

**National Agriculture Development Programme**

With the objective to increase productivity of important crops through focussed interventions and maximising returns to farmers, the National Agricultural Development Programme is being implemented with 100% Central assistance during 11th Five-year Plan. During 2011-2012 it is proposed to implement the scheme including Precision farming component with an outlay of ` 10814.75 lakhs.

**Targets and Achievements**

The financial allocation and the expenditure incurred for the year 2010-2011 and the proposed outlay for the year 2011-2012 for the State Plan Schemes are furnished below.

**Table17: Scheme Performance during 2010-2011 and Proposals for 2011-2012**

(Unit: Area in Ha.: Financial in lakh rupees)

| Name of the Scheme | Unit | 2010-2011 | | | | 2011-2012 (Proposed) | |
|---|---|---|---|---|---|---|---|
| | | Physical | | Financial | | Phy. | Fin. |
| | | Tar. | Achmt | Tar. | Achmt. | Tar. | Tar. |
| Integrated Horticulture Development Scheme - Area Expansion | Ha. | 22584 | 22642 | 266.88 | 266.88 | 50000 | 1925.00 |
| Horticulture Training Centre | Nos. | 6400 | 6400 | 6.97 | 6.97 | 6400 | 6.97 |
| City Vegetable Development Scheme | Ha. | 200 | 200 | 3.50 | 3.50 | 200 | 3.50 |
| Integrated Tribal Development Programme | Ha. | 904 | 904 | 40.00 | 40.00 | 904 | 40.00 |
| Western Ghat Development Programme | | 3 No | 3 No | 91.55 | 91.55 | | |
| | | | | | | 4200 Ha. | 171.00 |
| Hill Area Development Programme | Ha. | 4000 | 4000 | 126.25 | 126.25 | 4000 | 358.15 |
| National Agriculture Development Programme | Ha. | 14570 | 8081 | 4075.13 | 1461.86 | 29733 | 10814.75 |
| National Agricultural Insurance Scheme | Acre | 24008 | 24008 | 950.00 | 452.25 | 24000 | 950.00 |
| Weather-Based Crop Insurance Scheme | Acre | 4132 | 4132 | 50.00 | 43.28 | 4200 | 52.50 |
| **Total** | | | | **5610.28** | **2492.54** | | **14321.87** |

The above table shows that the area coverage under above mentioned schemes has significant effect.

b) Government of India/Shared Schemes

**Table 18: Physical achievement of state plan schemes during 2007-10**

| S.No | Name of the Schemes | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
|---|---|---|---|---|---|
| 1 | Integrated Horticulture Development Scheme (Ha) | 16802 | 22666 | 20249 | 22642 |
| 2 | Integrated Tribal Development Programme(Ha) | 904 | 907 | 907 | 904 |
| 3 | Western Ghat Development Programme (Ha) | 25 | 75 | 85 | 0 |
| 4 | Hill Area Development Programme (Ha) | 2067 | 1135 | 4645 | 4000 |
| 5 | State Horticulture Farms (Lakh Nos) | 85.00 | 89.93 | 114.58 | 168.73 |
| 6 | National Agriculture Development Programme(Ha) | 5840 | 4480 | 19041 | 9254 |
| | Total | 25723 | 29352.93 | 45041.58 | 36968.73 |

**Table 19: Physical achievement of GOI /shared schemes plan during 2007-10**

| S.No | Name of the Schemes | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
|---|---|---|---|---|---|
| 1 | National Horticulture Mission | 54395 | 46955 | 49194 | 43210 |
| 2 | Micro irrigation | 7819 | 11597 | 18008 | 26153 |
| 3 | National Bamboo Mission | 0 | 1006 | 900 | 300 |
| 4 | National Mission of Medicinal plants | 0 | 3260 | 1200 | 4112 |
| 5 | IAMWARM Project | 6047 | 9534 | 4744 | 8152 |
| | Total | 68261 | 72352 | 74046 | 81927 |

Farmers are moving towards the technology driven farming with optimizing their resources

The Financial Performance of the schemes are presented as below

**Financial performance of State plan Schemes**

**Table 20: Financial performance of State plan Schemes during 2007-11**

| S.No | Name of the Schemes | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
|---|---|---|---|---|---|
| 1 | IHDS Scheme (Ha) | 258.73 | 266.46 | 265.26 | 268.88 |
| 2 | Integrated Tribal Development Programme(Ha) | 40.01 | 40.01 | 40.01 | 40.01 |
| 3 | Western Ghat Development Programme (Ha) | 46.79 | 58.00 | 41.9 | 91.55 |
| 4 | Hill Area Development Programme (Ha) | 145.58 | 182.00 | 134.83 | 126.75 |
| 5 | State Horticulture Farms (Lakh Nos) | 670.00 | 695.57 | 824.38 | 1142.50 |
| 6 | National Agriculture Development Programme(Ha) | 2473.47 | 1949.48 | 3348.97 | 1453.35 |
| | Total | 3634.58 | 3191.52 | 4655.35 | 3123.04 |

**Financial performance of Government of India/Shared Schemes**

**Table21: Financial performance of State plan Schemes during 2007-11**

| S. No | Name of the Schemes | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
|---|---|---|---|---|---|
| 1 | National Horticulture Mission | 10396.60 | 9688.10 | 11854.98 | 10103.53 |
| 2 | Micro irrigation | 1593 | 2718.00 | 4659.50 | 8364.00 |
| 3 | National Bamboo Mission | 0 | 202.00 | 205.91 | 40.00 |
| 4 | National Mission of Medicinal plants | 0 | 682.875 | 300.00 | 834.70 |
| 5 | IAMWARM Project | 634.77 | 1553.16 | 783.40 | 1299.16 |
| | Total | 12624.37 | 12763.16 | 17417.88 | 20583.53 |

Financial performance of the above mentioned schemes are attained at commendable segment.

## Table22: component wise structure of NHM during 2007-11

| Sl. No. | Name of the Component | 2007-08 Achivement | | 2008-09 Achivement | | 2009-10 Achivement | | 2010-11 Achivement | |
|---|---|---|---|---|---|---|---|---|---|
| | | Phy (Nos.) | Finance (Rs.lakh) | Phy (Nos.) | Finance (Rs.lakh) | Phy (Nos.) | Finance (Rs.lakh) | Phy (Nos.) | Finance (Rs.lakh) |
| 1 | New Plantation | | | | | | | | |
| | a) Mango | 169 | 18.948 | 4444 | 495.267 | 7852 | 849.215 | 0 | 0 |
| | b) Amla | 59 | 6.66 | 0 | 0 | 1187 | 130.313 | 0 | 0 |
| | c) Grapes 1yr | 0 | 0 | 0 | 0 | 0 | 0 | 200 | 48.000 |
| | Total | 228 | 25.608 | 4444 | 495.267 | 9039 | 979.528 | | |
| 1st year | a) Mango | 714 | 27.462 | 0 | 0 | 10080 | 442.288 | 200 | 48.000 |
| | b) Amla | 550 | 22.192 | 0 | 0 | 2369 | 103.103 | 6705 | 735.257 |
| | c) Anola | 0 | 0 | 0 | 0 | 0 | 0 | 800 | 93.727 |
| | d) Guava | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | e) Sapota | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 1264 | 49.654 | 0 | 0 | 12449 | 545.391 | 7705 | 877 |
| 2nd year | a) Mango | 0 | 0 | 0 | 0 | 9538 | 615.898 | 7816 | 370.185 |
| | b) Amla | 495 | 33.372 | 0 | 0 | 2354 | 155.585 | 0 | 0 |
| | c) Anola | 1759 | 83.026 | 0 | 0 | 24341 | 1316.874 | 1055 | 55.692 |
| | Total | 495 | 33.372 | 0 | 0 | 11892 | 771.483 | 7816 | 370.185 |
| 3rd year | a) Mango | 0 | 0 | 0 | 0 | 0 | 0 | 8290 | 597.301 |
| | b) Anola | 0 | 0 | 0 | 0 | 0 | 0 | 2075 | 160.284 |
| | High density planting | | | | | | | | |
| | Mango 1yr | 0 | 0 | 0 | 0 | 2100 | 446.004 | 1167 | 287.657 |
| | Cashew 1 yr | 0 | 0 | 0 | 0 | 942 | 185.529 | 0 | 0 |
| | Banana 1 yr | 0 | 0 | 0 | 0 | 1808 | 443.714 | 0 | 0 |
| | Guava 1Yr | 0 | 0 | 0 | 0 | 0 | 0 | 156.9 | 28.812 |
| | Total | 0 | 0 | 0 | 0 | 4850 | 1075.247 | 1323.9 | 316.469 |
| 2 | Non-perennial-Banana | | | | | | | | |
| 1st year | | 401 | 30.07 | 0 | 0 | 8424 | 625.487 | 10369 | 1758.094 |
| 2nd year | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3rd year | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pineapple (sucker) 1yr | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 2.437 |
| | Total | 401 | 30.07 | 0 | 0 | 8424 | 625.487 | 10379 | 1760.531 |
| | Banana (TC) 1yr | 0 | 0 | 0 | 0 | 0 | 0 | 1598.54 | 491.095 |
| 3 | Flowers | | | | | | | | |
| | a) Cut flowers | 0 | 0 | 0 | 0 | | | | |
| | SF | 0 | 0 | 0 | 0 | 114 | 39.899 | 100 | 40.25 |
| | Others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | b)Bulbous | | | | | | | | |
| | SF | 0 | 0 | 0 | 0 | 725 | 317.285 | 1000 | 451.455 |
| | Others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | c) Loose flowers | | | | | | | | |
| | SF | 114 | 13.525 | 0 | 0 | 2595 | 316.744 | 2526 | 314.869 |
| | Others | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | Total | 114 | 13.525 | 0 | 0 | 3434 | 673.928 | 3626 | 806.574 |
| 4 | Spices | | | | | | | | |
| | a) chillies | 291 | 39.208 | 0 | 0 | 7450 | 853.543 | 5130 | 645.95 |
| | b) turmeric | 59 | 6.66 | 1990 | 223.669 | 4050 | 452.22 | 4271.3 | 541.277 |
| | c) Coriander | 0 | 0 | 0 | 0 | 0 | 0 | 1000 | 124.879 |
| | d) Black pepper | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 99.992 |
| | c) total | 350 | 45.868 | 1990 | 223.669 | 11500 | 1305.763 | 10901.3 | 1412.098 |
| 5 | Aromatic | | | | | 130 | 14.386 | 0 | 0.24 |
| 6 | Plantation | | | | | | | | |
| | a) Cashew | 0 | 0 | 0 | 0 | 1900 | 119.4 | 0 | 0 |
| | b) Cocoa | 504 | 30.083 | 0 | 0 | 6686 | 366.58 | 0 | 0 |
| | c) Total | 504 | 30.083 | 0 | 0 | 8586 | 485.98 | 0 | 0 |
| 7 | Maintenance | | | | | | | | |
| 1st year | a) Cashew | 0 | 0 | 0 | 0 | 1929 | 43.154 | 3869 | 444.607 |
| | b) Cocoa | 0 | 0 | 0 | 0 | 4695 | 104.4 | 3907.5 | 434.048 |
| | c) Total | 0 | 0 | 0 | 0 | 6624 | 147.554 | 7776.5 | 878.655 |
| 2ndy ear | a) Cashew | 0 | 0 | 0 | 0 | 3293 | 110.38 | 2150 | 48.354 |
| | b) Cocoa | 0 | 0 | 0 | 0 | 1606 | 54.743 | 5851.5 | 133.77 |
| | c) Total | 0 | 0 | 0 | 0 | 4899 | 165.123 | 8001.5 | 182.124 |
| 3rdy ear | a) Cashew | 0 | 0 | 0 | 0 | 0 | 0 | 2224.55 | 75.535 |
| | b) Cocoa | 0 | 0 | 0 | 0 | 0 | 0 | 4302 | 141.449 |
| | c) Total | 0 | 0 | 0 | 0 | 0 | 0 | 6526.55 | 216.984 |
| | Grand total | 0 | 0 | 0 | 0 | 11523 | 312.677 | 76974.3 | 8107.216 |
| 8 | Rejuvenation | | | | | | | | |
| | a) Mango | 27 | 4.082 | 0 | 0 | 1194 | 174.001 | 2830 | 364.101 |
| | b) Cashew | 333 | 50 | 0 | 0 | 2409 | 361.32 | 1605 | 262.373 |
| | c) Total | 360 | 54.082 | 0 | 0 | 3603 | 535.321 | 4435 | 626.474 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Creation of water resources | 14 | 142.36 | 24 | 240 | 15 | 50 | 5 | 97.640 |
| 9 | Protected cultivation | | | | | | | | |
| | a)GH (hitech) | | | | | | | | |
| | SF | 6.475 | 208.837 | 16.5 | 526.5 | 25.592 | 762.89 | | |
| | Others | 0 | 0 | 0 | 0 | 2 | 40.33 | | |
| | Total | 6.475 | 208.837 | 16.5 | 526.5 | 27.592 | 803.22 | 414180 | 1386.101 |
| | b)GH (normal) | | | | | | | | |
| | SF | 0 | 0 | 0 | 0 | 0.3 | 3.75 | 0 | 0 |
| | Others | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | c) Mulching | 0 | 0 | 0 | 0 | 70 | 3.5 | 0 | 0 |
| | d)Shadenet | 0.635 | 0.445 | 1.5 | 1.05 | 3.7 | 2.59 | 0 | 0 |
| | | 7.11 | 209.282 | 18 | 527.55 | 101.592 | 813.06 | 0 | 0 |
| 10 | INM-IPM | 602 | 6.018 | 0 | 0 | 5700 | 55.986 | 2100 | 20.965 |
| 11 | Organic farming | 39 | 3.898 | 950 | 92 | 200 | 19.998 | 400 | 16 |
| | Vermicompost | 19 | 5.7 | 74 | 22.02 | 191 | 52.35 | 55 | 21.09 |
| | Vermi compost units (HDPE) | | | | | | | 155 | 9.29 |
| | Certification | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 58 | 9.598 | 1024 | 114.02 | 391 | 72.348 | 610 | 46.38 |
| 12 | HRD | 0 | 0 | 0 | 0 | 21600 | 359.6 | 2145 | 75.118 |
| 13 | Pollination support | 5 | 0.4 | 0 | 0 | 2900 | 21.2 | 545 | 4.14 |
| 14 | Model nursery (private) | 0 | 0 | 0 | 0 | 5 | 18 | 1 | 45 |
| 15 | Small nursery (private) | 3 | 4.5 | 3 | 4.5 | 9 | 4.5 | 2 | 7.625 |
| | total | 3 | 4.5 | 3 | 4.5 | 14 | 22.5 | 3 | 52.625 |
| 16 | Model nursery (public | 1 | 9 | 0 | 0 | 0 | 0 | 1 | 18 |
| 17 | Small nursery (public | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 |
| | total | 1 | 9 | 0 | 0 | 2 | 3 | 1 | 18 |
| 18 | Veg. seed pdn | | | | | | | | |
| | Public | 0 | 0 | 0 | 0 | 18 | 15.5 | 0 | 0 |
| | Private | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 0 | 0 | 0 | 0 | 18 | 15.5 | 0 | 0 |
| 19 | Mission Mgt | | | | | | 228.095 | | 10798.8 |
| 20 | Post Harvest Mgt | 0 | 0 | 76 | 220.78 | 0 | 0 | 6 | 6 |
| | Total | 4406.11 | 663.426 | 7579 | 1825.786 | 111372 | 7891.233 | 83909 | 10799 |
| 21 | TANHOPE | 0 | 0 | 4 | 16.18 | 0 | 0 | 0 | 0 |
| | Grand Total | 4406.11 | 663.426 | 7583 | 1841.966 | 111372 | 7891.233 | 83909 | 10799 |

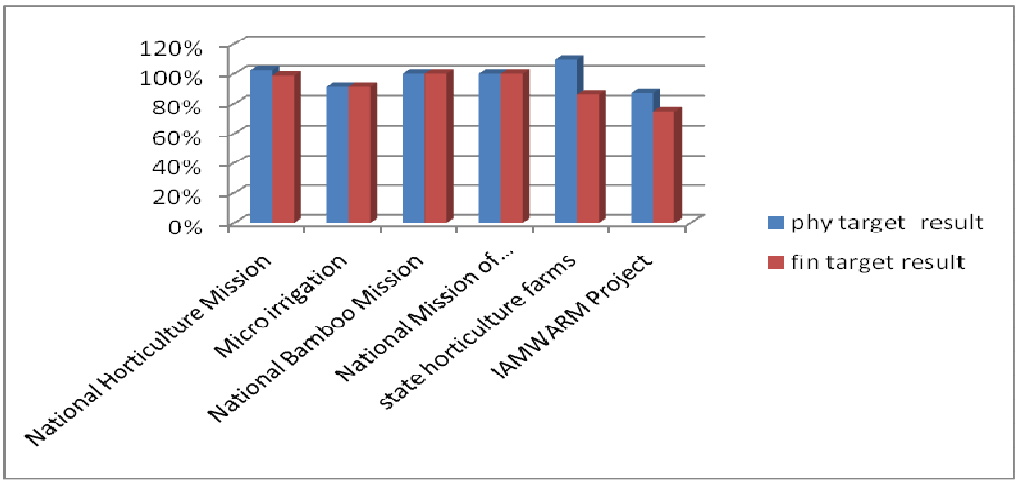
**Summary report of the schemes during 2008-2011**

The overall physical target achievement was found be higher in NHM, STATE HORTIUCULTURE FARMS AND IAMWARM projects than financial achievement. More or less 90 per cent of the targets were achieved both in physical and financial targets during 2008-2011.

Planting material production units by public private sectors had 62 units as target, but only 42 units were established. i.e the achieved only 67 and 61 per cent of the physical and financial targets. In establishment of new fruit (perennial ) garden, mango and aonla were concentrated with the phycial target of 15490 ha , but the achievement was only by 77 per cent, where as it was in 99 per cent in non perennial garden. The flower production was targeted in 3545 ha , the achievement was 89 per cent. The financial target was achieved at 92 per cent. The spices were targeted for 11650 ha , it was targeted at 99 per cent with 100 per cent achievement in financial commitments.

In Plantation crops, the physical target was 92832 ha and the achievement was 75 per cent with 89 per cent of financial achievement The physical target of Creation of water sources was 135 numbers, but the achievement was 59 per cent. The protected cultivations of establishment were 552435 sq.m, the achievement was only 60 per cent with utilization of 60 per cent financial sanction. The promotion of INM/IPM in 6000 ha were targeted, it was per cent achievement. The adoption of Organic farming were targeted in 1900 ha , the achievement was 65 per cent. For HRD, The financial target was 562 lakhs, it was utilized at 51 per cent. The pollination support through bee keeping were targeted for 2680 numbers, the achievement was more that of the target. The fund for post harvest management was not effectively utilized. The overall financial commitment for horticulture was Rs 18079.36 lakh , the utilised fund was Rs 8784 .14 lakh ie 48 per cent.

Figure 4. Overall success of physical and financial targets of schemes




**SWOC analyses - Horticultural Scenario in Tamil Nadu**

| | |
|---|---|
| **Strengths**<br>• Potential area for further expansion of horticulture crops in T.N<br>• Prevalence of off-season cropping (e.g. mango, grapes, etc.) is unique to Tamil Nadu.<br>• Availability of Export location of airports and sea ports<br>• Strong institutional wealth from Tamil Nadu Agricultural University (TNAU) and other Research Institutions.<br>• State Government policies facilitate growth of the sector (TANFLORA, AEZ's). | **Weaknesses**<br>• Lack of awareness on Hi-tech horticulture / quality consciousness among growers<br>• Lack of Adherence to phyto-sanitary standards hinders acceptance in foreign markets.<br>• The presence of small land holdings hampers adoption of best practices.<br>• Lack of price discovery mechanism often leads to wide fluctuation in market prices.<br>• There is low focus on post harvest management and facilities like cold storage, pre-cooling and waxing centres, processing units etc.<br>• The marketing channels are not well develop |
| **Opportunities**<br>• Large tracts of drylands / rainfed areas / wastelands can be utilized for promotion of horticulture.<br>• Good opportunity to set up processing industries for horticultural crops on the back of improved post harvest practices<br>• More export opportunities to the Far East which can be tapped (Tamarind, Chillies, Mango etc)<br>• Persistent demand in developed countries for Green foods / Organic foods.<br>• Good scope for contract farming initiatives which needs to be encouraged through supportive policies. | **Challenges**<br>• The dwindling water resources could pose a serious issue in the coming years<br>• Non-availability of work force for agriculture during season.<br>• Stiff competition from forestry crops in future |

**Suggestions**

Works are still needs to be done before India achieves the optimum results in the horticulture sector. There is a need to have secondary and tertiary industries related to processing of horticulture products in the vicinity of the production area. He adds that there is a need to increase awareness among the farmers about the new methods of agriculture production and also monetary investment and proper planning. Governments must take measures to promote industries involved in the processing of fruits and vegetables into products like pickles, jams, jellies, squash etc. Another area which is yet to get much attention for the government and the corporate sector is floriculture.

The following are some of the issues that government needs to sort out in order to encourage further investment and generate greater employment opportunities in the horticulture and floriculture sector –

- A large part agricultural land in India is still dependent on monsoons. Developing irrigation facility must be a priority area for the government.
- The back-up infrastructure facilities like cold-storages, roads and distribution and management of horticulture products must also be given due attention.
- Farmers need to be provided the right technical inputs so that the yield is optimum and of a high quality.
- Organic farming must be encouraged so that Indian horticulture product is able to compete with those arriving from other countries in the international market.
- Research and development is critical and must be promoted in the sector in areas like development of high-yielding variety of seeds and soil testing.
- Packaging and marketing of horticulture products is another area that leaves a lot to be desired and people engaged in the sector should be made aware of the two.
- The farmers involved in horticulture sector should have easy access to financial instruments like micro-credits and loans.
- Practices like cooperative farming needs to be promoted among the farmers.
- Tax structures on horticulture products need to be rationalized so that the cost of the end products can be kept within reasonable limits. Innovations should be promoted in the sector so that newer and useful agricultural implements can be manufactured. .
- Farmers are to be focused on productivity enhancement and supplementary area coverage with modern technological inputs and perfect market intelligence from traditional farming into market driven and profitable horticulture business.