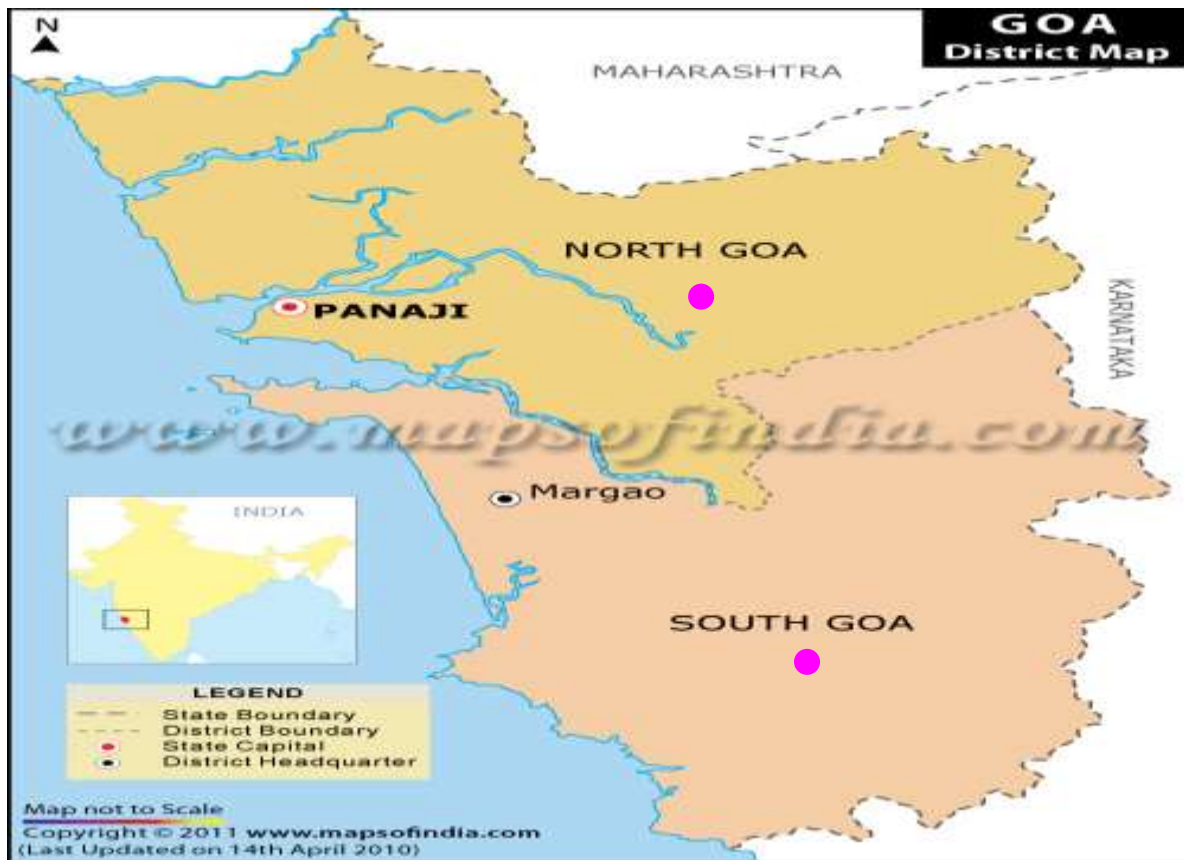


**Report of the Joint Inspection Team on its visit to Goa during 16-19<sup>th</sup> March, 2015 to review the progress under the Mission for Integrated Development of Horticulture (MIDH)**



**Districts visited by J.I.T** ●

1. North Goa
2. South Goa



**Mission for Integrated Development of Horticulture**

**Ministry of Agriculture**

**Department of Agriculture & Cooperation**

**Krishi Bhawan, New Delhi-110001**

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## OBSERVATIONS

1. After harvesting of banana bunch, Pseudo stem were not removed which invited pests.
2. Red Palm beetle (10%), Bud rot (20%) problem in coconut and Sigatoka in Banana were observed which was serious in Thane Panchayat (North Goa).
3. Leaf miner and thrips have not controlled properly in cashew growing orchards.
4. In Bicholim (North Goa), JIT observed that brinjal grafted on resistance root stock and grown in polyhouse found resistant to wilt and borer.
5. JIT noticed that the high density mango having double root stock with 14 cvs were planted in the orchard, presently the performance of cultivars is good but varietal behaviours in high density is yet to be observed by the experts.
6. For Drip irrigation, one company is enlisted for the entire state, more agencies are to be nominated by the SHM to provide quick and timely services to the beneficiaries.
7. Under polyhouse, tomato seedlings died due to wilt (30-35%).
8. Area expansion programme of Cashew is without drip in Uguem (South Goa) area.
9. Wilt in chilli has been observed which is common in cv Nishat, grown in Nagar goan (North Goa).

## **ACTIONABLE ISSUES**

1. For control of Solanaceous wilt under polyhouse, proper advice needs to be given to farmers for managing the problems. The poly house Tomato growers may be advised to use resistant cultivars and apply *Trichoderma* in beds before planting of tomato seedlings. Efforts are needed to control bud rot and Red palm beetle in coconut through IPM to avoid losses.
2. For cluster plantation of vegetable seedlings, low tunnel target needs to be enhanced in respective of AEP of vegetables.
3. It is advised to have a detailed pest/diseases management programme thereby consulting the experts to prepare scheduled crop wise time-table.
4. The Department is slow as for as the planting material and seeds are concerned, it is therefore, the existing farms and nurseries required further strengthening to produce sufficient seeds/seedlings of vegetable. The nursery needs to be accredited for supply of genuine planting material.
5. More companies should be engaged to install drip in the State to provide qualitative services to the beneficiaries.
6. It is desirable that SMD should cooperate with JIT during his visit to have first hand information about the implementation of schemes in the state.
7. State should arrange to uploaded the monthly NHM physical and financial progress at the district level on the MIDH website on a regular basis

## **Report of the Joint Inspection Team on its visit to Goa during 16-19<sup>th</sup> March, 2015 to review the progress under the National Horticulture Mission**

The Joint Inspection Team (JIT) comprising Dr. Om Prakash, Chief Consultant, National Horticulture Mission, Dr. M. Thangam, Senior Scientist Horticulture, ICAR Research Complex for Goa, and Officers of SHM, Goa visited during 12-15<sup>th</sup> February, 2014 to review the progress under National Horticulture Mission (NHM), National Mission on Micro Irrigation (NMMI) and Vegetable initiative to urban cluster (VIUC) in the State. Audhut P. Sawant, A.P.O. (Cashew), Directorate of Agriculture, Tonca, Caranzalem, Kishore N. Bhabhe, Zonal Agriculture Officer, Satari, Valpoi and Mr. Anil Noronthu, Zonal Agriculture Officer, Mapusa, Agriculture/Horticulture Department of Goa joined the team.

The JIT covered the district of North & South Goa, activities which were visited in different districts are as follows:

**NHM-I:** Area Expansion of mango, cashew nut, Banana, Coconut, flowers and vegetables cultivation under protected cultivation, cashew processing unit, vegetable seed production

**NMMI-** Drip irrigation in mango, cashew, Banana and vegetables

**VIUC-**Area Expansion, protected cultivation

### **Profile of Goa State**

Goa has two Districts: North Goa district – comprising of Tiswadi, Bardez, Pernem, Bicholim, Sattari, and Ponda talukas and the South Goa district comprising of Sanguem, Canacona, Quepem, Salcate and Mormugao talikas. There are 402 revenue villages in Goa.

Goa receives rain from the South-West monsoons. The average rainfall is 2776.9 mm. Rainy season is spread over four months from June to September. Occasional thunder showers are experienced in May and October. Goa experiences

warm and humid tropical climate. The summer temperature ranges from 24°C to 30°C. The average relative humidity is 75.90%.

In Goa, the land elevation ranges from sea level to 1022 meters. The highest point is the Wagheri hills in Sattari taluka. The Ghat section of NH-4, rises to 650 meters MSL near Anmod. Khazans or lands along the estuaries (rivers with sea water in their lower reaches) are below sea level and are protected by bunds or dykes and sluice gates. The main tourist season is from November to February, when the weather is pleasant and not rainy or hot.

The soils of Goa are mostly lateritic (81%). They are sandy loam to silt-loam in texture, well drained and highly acidic (5.5 to 6.5 pH). These soils have moderate organic carbon but are poor in phosphorus and potash. About 11% of the soils located along the seacoast and estuaries are sandy-to-sandy loams. They include the Kher lands and beach fronts. The remaining 8% of the soils are alluvial in nature. The Khazans and adjoining areas have alluvial soils with high water tables and are subject to inundation by saline water.

More than half the farmer have less than half-hectare land each. Thus 56% of the people own less than 11% of the land. On the other hand 20% of the owners possess about 30% of the land with a holding size of one to five hectares each. Only 2% people own more than 5 hectares land.

The “Comunidade” is an institution peculiar to Goa. The land is held as a common property of the “Gaonkars” or “Joneiros” who are the original inhabitants of a given village or group of villages. The land is leased out and the receipts thereof are utilized to (i) run the comunidade administration (ii) provide funds to local church or temple and (iii) pay a dividend (Jons) to the members.

In Goa traditional sources of irrigation were storage tanks, small diversion bandharas, natural springs and wells. For rabi paddy (Vaigon) irrigation was mostly from storage tanks located in Salcete and Bardez. The usual practice is to cultivate kharif paddy in tank bed and the water weir is closed early in September after harvest of Kharif paddy. In Ponda, Sanguem and Bicholim small kucha “diversion”

works are constructed on Nalas to irrigate paddy fields during Rabi. Considerable area under arecanut depends on various springs at higher altitudes.

Agriculture is the major economic activity contributing 6% to the SDP, only after Tourism & Mining. 16.6% people are engaged in Agriculture in 2001 compared to 27.5% in 1991. Area under food grain cultivation is decreasing, as farmers prefer horticultural crops as less labour intensive. As tourism is a good source of income, farmers in the villages are leaving the lands fallow & move towards tourism sector.

## **AGRICULTURE SCENARIO & LAND UTILIZATION IN GOA**

### **PATTERN OF LAND AREA IN ha.**

<b>Total area for land utilization</b>	<b>361113</b>
Forest cover	125473 – 34.74%
Land not available for cultivation	37137
Permanent pastures & other grazing land	1305
Cultivable waste land	52829
Net Area Sown	134208
Area Sown more than once	35310
Food grain crops	63830 ha - 37.65%
Horticulture crops	100934 ha – 59.54%
Sugarcane, oil seeds	4754 ha – 2.81%
Irrigated Area	36000 ha – 22%
Rainfed Area	78%
Population supported by Agriculture	16%
Holding upto 2 ha	92%
<b>Total cropped Area</b>	<b>169518 – 46.94%</b>

### Area & Average Yield of various crop in Goa

S. No.	Name of the crop	Area in ha	Average Yield (kgs/ha)
1.	Cashew Nut	55612	395
2.	Coconut	25545	4995 Nos
3.	Arecanut	1677	1590
4.	Mango	4494	4204
5.	Banana	2398	9791
6.	Pineapple	341	16258
7.	Vegetables	5547	10100
8.	Other fruits (Chickoo, papaya, lemon etc.)	3699	10783
9.	Oil palm	823	2529
10.	Black pepper	666	312
11.	Trees spices	101	26
12.	Vanilla	31	18

### Potential of Horticulture

The production and productivity of most of the crops especially agronomic crops has remained static for years. There is limited scope for expansion of the area under these crops. Coupled with this is the high labour wages and shortage of labour due to alternate employment opportunities in mining, tourism and industrial sector. The high literacy level has also resulted in demands for higher wages. The cost of cultivation of the cereal crops in Goa is therefore higher compared to other adjoining states. Paddy, which is the staple food and primary agriculture crop is therefore mainly grown for self use and not commercially.

The younger generation is shy of agriculture and has no respect for this profession. At present only 15% of the population is directly engaged in Agriculture. The draft animals are getting phased off in course of time. Due to small size of holdings and undulating terrain mechanization has limited scope. These factors have led to development of horticulture sector especially perennial horticulture.

The Horticulture crops occupy about 60.5% of the total cropped area with fruits, vegetable, cashew, coconut and spices. Cashew is major crop covering 55672 ha followed by coconut which occupies 25608 ha.



**Fruits:** Mango, Cashew, Coconut, Banana, Pineapple, Chickoo, Jackfruit, Papaya, Arecanut etc.

**Field Crops:** Paddy, Ragi, Sugarcane, Goundnut, Cowpea, Oil Palm etc.

**Vegetables:** Brinjal, Bhendi, Chillies, Cucumber, Pumkin, Gourds, Musk melons, Red amaranthus, Raddish, Knol-Kohl, Bottle gourd, long beans, Cluster beans etc.

**Flowers:** Chrysanthemums, Jasmine, Crossandra, Dahlia, Roses, Hibiscus, Marigold, Orchids, Gerbera, Anthuriums, Gladiouls, Tuberose, Daisy, Zinnia, Bougainvillea etc.

**Spices:** Black Pepper, Nutmeg, Kokum, Cardamom, Ginger, Turmeric, All Spices, Cinnamon, Clove etc.

**Tubers:** Colocasia, Yam, Elephant foot, Suran, Kange, Sweet Potato, Madi etc.

Being a tourist destination and a state with better living standard and higher per capita income, horticulture products have a very good local market. The total population of the state is 13.47 lakh as per 2001 census. Besides this state handles about 18 to 20 lakhs tourist annually, The demand of fruits, vegetables, coconut, cashew-nuts to this large population of 32 lakh annually is tremendous. At present about 90000 tons of vegetables (300 ton per day), 30000 tons of fruits (100 tons per day) and 5-6 lakh tender coconuts (36000 per week) are brought in annually from other States to meet the needs of locals and tourists. Vegetables find their entry into the hotels for culinary purpose, and the fruits are largely used for table purpose or for juice. Though all the type of vegetables or fruits brought in from other States may not be commercial viable in Goa due to agro-climatic factor, some of the vegetables, fruits can be successfully cultivated, which can generate better economic returns.

Due to limitation of the availability of land the need is to identify some few types of vegetable and fruits or plantation crops with emphasis on large-scale cultivation. This will help in generation of tradable volume, development of skills for cultivation and help in reduction of the purchases from other states. The crops like cashew-nut, coconut, mango, jackfruit, aowla, chickoo, papaya, banana, pineapple, black pepper, nutmeg, dry chillies some medicinal plants, flowers like orchids,

anthurium and vegetable like Okra, cucurbits and gourds, sweet corn could be promoted successfully for cultivation in Goa.

Goa is known in the tourism industry as land of spices, cashew nuts, coconuts and tropical fruits, besides the beaches. Many of the foreign as well as domestic tourists prefer to visit such plantation to know more about them and to be with nature. This is being developed as a new sector to sell the horticulture as Eco-tourism or Agro tourism.

The perennial horticulture crops and tropical flowers play a major role in this concept and have vast potential to divert beach tourism to Eco tourism in the hinterland of State of Goa. Already about a dozen of horticulture farms have started selling this concept, which is paying rich dividends.

The use of chemical fertilizer and pesticide in Goa is limited. This has become a promotional factor in selling the local products to the tourists who prefer organic foods. The cultivation of Horticulture crops under organic concept is more sustainable and remunerative which needs to be promoted.

The food processing industry largely depends on the horticultural crops. The industry has large scope for employment generation through processing and value addition. In Goa the largest single horticultural product used for processing is the cashew-nut. The crop generates employment at all stages from its cultivation to marketing. The crops like cashew therefore need to be promoted for large-scale cultivation, to support processing industry and to cater to the tourism industry.

Due to needs of various non-agricultural activities like tourism, mining, housing and industry, Goa faces a tremendous pressure on the cultivable land. Added to this is the undulating terrain and non-availability of adequate irrigation facilities. The land holdings are also small to promote any commercial cultivation of cereal or pulse crop. Considering these factors promotion of horticulture is most potential sector that needs to be promoted for rural upliftment.

**Area, production & productivity (APP) (Year-2014-15)**

<b>Sl. No.</b>	<b>Crop</b>	<b>Area (000 ha)</b>	<b>Production (000 mt)</b>	<b>Productivity (t/ha)</b>
1.	Fruit			
	(a) Name of Perennial fruits			
	(i) Cashew	55.936	24.332	0.435
	(ii) Mango	4.819	8.944	1.856
	(b) Name of Non Perennial fruits			
	(i) Banana	2.324	26.308	11.32
	(ii) Pineapple	0.295	4.9	16.01
2.	Vegetable crops	7.004	79.92	11.411
3.	Spices	0.737	0.234	0.318

**Annexure- II**

**DISTRICT WISE AREA PRODUCITON AND PRODUCTIVITY OF MAJOR HORTICUTLURAL CROPS FROM 2004 TO 2014**

<b>Sr. No.</b>	<b>Name of crops</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>	<b>2008-09</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	
1.	Coconut	Area (ha)	25160	25312	25468	25545	25608	25686	25718	25730	25712	25750
		Prod. (M. Nuts)	123.52	125.34	126.68	127.57	128.18	128.72	128.8	129.73	122.72	128.15
		Productivity	4909	4952	4978	4994	5006	5011	5011	5024	4773	4977
2.	Cashew	Area (ha)	54858	55021	55302	55612	55672	55732	55732	55737	55747	55936
		Prod (T/ha)	25556	27070	24380	21942	13165	17556	23138	23240	23804	24332
		Productivity	0.466	0.492	0.441	0.395	0.236	0.315	0.415	0.416	0.427	0.435
3.	Mango	Area (ha)	4226	4339	4414	4494	4514	4716	4750	4760	4771	4819
		Prod (T/ha)	18700	27075	19280	18894	7558	8334	9284	8536	9036	8944
		Productivity	4.425	6.240	4.368	4.204	1.674	1.767	1.954	1.793	1.894	1.856

4.	Banana	Area (ha)	2195	2225	2342	2398	2302	2219	2250	2283	2288	2324
		Prod (T/ha)	19755	21026	23420	23480	24651	24662	25006	25824	25918	26308
		Productivity	9.0	9.450	10	9.791	10.7	11.1	11.1	11.31	11.32	11.32
5.	Vegetable	Area (ha)	7800	8144	8213	5547	5703	5671	5880	6498	6645	7004
		Prod (T/ha)	74725	82580	84290	56027	57603	58130	60472	78201	80511	79920
		Productivity	9.58	10.14	10.263	10.1	10.1	10.25	10.28	12.03	12.11	11.41

## **Production of Planting Material**

Under National Horticulture Mission (NHM), 3 Model Nurseries and 6 Small Nurseries were established in the Public Sector in Goa. The Nurseries are well established with enough of mother plants and other facilities required for carrying out propagation of good quality planting material. The vegetable seed production of local strains is done on departmental farms whereas high yielding and hybrid seeds are made available by National Seed Corporation and Maharashtra State Seed Corporation. Besides, there are 3 big well established nurseries in the private sector producing very good quality cashew and mango grafts recognised by the State under Nursery Act 1995. ICAR Goa is also establishing a model nursery for production of cashew and mango grafts on their Krishi Vigyan Kendra Farm at Ela Old Goa.

The planting materials required for the NHM programme are obtained from the Public and Private Sector nurseries. A technical committee with the assistance of ICAR has been nominated by the Director of Agriculture to inspect and reserve the required planting material for different schemes of the Directorate.

## **Nursery sub plan requirement & available**

Under National Horticulture Mission (NHM), 2 Model Nurseries and 6 Small Nurseries were established in the Public Sector in Goa. The nurseries are well established with enough of mother plants and other facilities required for carrying out propagation of good quality planting material. The vegetables seed production of local strains is done on departmental farms whereas high yielding and hybrid seeds are made available by National Seed Corporation and Maharashtra State Seed Corporation. Besides, there are 3 big well established nurseries in the private sector producing very good quality cashew and mango grafts recognized by the State under Nursery Act 1995. ICAR Goa is also establishing a model nursery for production of cashew and mango grafts on their Krishi Vigyan Kendra Farm at Ela Old Goa.

The planting materials required for the NHM programme are obtained from the Public and Private Sector nurseries. A technical committee with the assistance

of ICAR has been nominated by the Director of Agriculture to inspect and reserve the required planting material for different schemes of the Directorate.

S. No.	Crop & Variety	Planting material available at Govt. Nursery / ICAR/KVK	Identified progressive farmers	Registered private nurseries	Total requirement	Surplus / shortfall	Plan for meeting up the shortfall
1.	Cashew grafts- v4,v7,v8	75000		150000	50000	(+) 65000	-
2.	Mango grafts- Malcorado, Hilario, Ratnagiri Alphonso, Neelam, Totapuri & other local varieties	25000		25000	25000	Nil (+) 25000	-
3.	Kokum grafts	500		-	2000	(-) 1500	To be purchased from UAS Dharwad
4.	Kokum seedling	1000		-	1000	(-) 1000	
5.	Chickoo grafts- DSH1, Kallipati, DSH2, Cricket ball	1000		-	2000	(-) 1000	
6.	Guava	2000		-	2000		
7. (a)	Banana suckers- G9, local varieties	-	100000	-	100000		
(b)	Banana tissue culture	-	-	-	50000	(-) 50000	To be purchased from neighbouring State, Tissue culture Laboratories
8 (a)	Pineapple slips- Giant Kew, Queen	-	225000 (Sirsi)	-	225000	-	-

(b)	Pineapple tissue culture	-	-	-	45000	(-) 45000	To be purchase from neighbouring State, Tissue Culture Laboratories
9.	Spices- Nutmeg, Pepper, Turmeric, Ginger, etc.	40000 plants	2 tonnes seeds of turmeric & Ginger	-	40000 tonnes +2	-	-
10.	Papaya	15000	-	-	15000	-	-

Sl. No.	Planting material	Government farm		Private nursery	
1.	Cashew	75000	75000	150000	150000
2.	Mango	25000	25000	10000	10000
3.	Kokum grafts	5000	5000	-	-
4.	Kokum seedlings	5000	5000	-	-
5.	Chickoo grafts	2000	2000	-	-
6.	Guava grafts	2000	2000	-	-
7.	Banana suckers	--	--	100000 - (Progressive farmers)	150000 - (progressive farmers)
8.	Pineapple slips/ suckers	--	--	225000- (Progressive farmers)	225000 - (progressive farmers)
9 (i)	Spices (Pepper & Nutmeg)	40000	45000	-	-
(ii)	Turmeric & Ginger	--	--	2.00 m.t.	2.00m.t.
10.	Papaya	150000	150000	--	--



- |                         |  |
|-------------------------|--|
| 1. Government Nurseries | <p>Model Nursery of Department of Agriculture, Government of Goa at Codar, Kalay, Ela, Mapusa &amp; Pernem</p> <p>Model Nursery of Krishi Vigyan Kendra, ICAR, at Old Goa.</p>                   |
| 2. Private Nurseries    | <p>a) Sidharth Nursery, Sal Bicholim Goa</p> <p>b) Samrudhi Nursery, Sattari Goa</p> <p>c) Vikas Nursery, Dhargal Goa</p> <p>d) Mahamaya Nursery, Sal</p> <p>e) Harekrishna Nursery, Sattari</p> |
| 3) Research Stations    | <p>* Regional Fruit Research Station,</p> <p>* Konkan Krishi Vidyapeeth, Vengurla,</p> <p>* University of Agri Sciences, Dharwad</p>   |

### **Rejuvenation /Replacement of Senile plantation including canopy management**

Out of 55800 hectares of area under cashew crop in the State, about 30000 ha is by seedling progeny. Out of 30000 ha about 10000 ha is under Goa Forest Development Corporation Ltd., who are provided technical support and assistance by Directorate of Cashew & Cocoa Development, Kochi.

### **Integrated Post Harvest Management**

The major horticulture produce in the state is cashew which is processed within the available processing units which has the processing capacity of more than 40000 tons annually however the present processing is short by almost 15000 tons. Hence, there is no scope for post harvest intervention on large scale in cashew.

However for crops like banana, pineapple, mango there is a scope of promoting ripening chambers.

Collection and storage centres could also be promoted amongst the progressive farmers with large holdings. The vegetables and fruits which are marketed require to be transported in refrigerated vans to avoid post harvest losses and the consumers get the fresh produce.

### **Establishment of Marketing Infrastructure for Horticultural produce**

The state has sufficient markets to cater to the use of local producers which have been constructed by APMB and local governing bodies. The concept of satellite markets with air cooled facilities is taking shape in some parts of state. The retail market chain/supermarkets are well established hence the need for new markets is not felt as the produce is either lifted directly from the farm gate or is sold in APMB/weekly markets where most of the facilities are available. However, it is felt necessary to promote mobile vending carts with cool chambers at strategic locations in the major cities and towns and are required to be promoted under the above programme.

#### **Tentative production of Planting Material for 2013-14 & 2014-15**

Sr. No.	Planting material	Government farm		Private nursery	
		2013-14	2014-15	2013-14	2014-15
1.	Cashew	75000	120000	150000	200000
2.	Mango	25000	30000	25000	30000
3.	Kokum grafts	5000	5000	-	-
4.	Kokum seedlings	5000	5000	-	-
5.	Chickoo grafts	5000	5000	-	-
6.	Banana suckers	--	--	160000 (Progressive farmers)	170000 (Progressive farmers)
7.	Pineapple slips / suckers	--	--	400000 (Progressive farmers)	450000 (Progressive farmers)
8.	Spices	41000(1000 from Research Station)	45000(1000 from Research Station)	--	---

- |                          |   |
|--------------------------|---|
| 1) Government Nurseries- | Model Nursery, Department of Agriculture,<br>Government of Goa, Codar<br><br>Model Nursery, Krishi Vigyan Kendra, ICAR, Goa |
| 2) Private Nurseries-    | Sidharth Nursery, Sal Bicholim Samrudhi Nursery,<br>Vikas Nursery   |
| 3) Research Stations-    | Regional Fruit Research Station, Konkan Krishi<br>Vidyapeeth, Vengurla, University of Agri Sciences,<br>Dharwad             |

### **Status of National Horticulture Mission in Goa**

The Centrally Sponsored Scheme of National Horticulture Mission (NHM) is being implemented in 2 districts of Goa since 2005-06.

The programme in the State of Goa is being implemented by the State Horticulture Mission (SHM) through District Mission Committees involving farmers, Societies, NGOs, Grower Associations, SHGs, State institutions etc. The district covered under the programme includes South Goa and North Goa.

The focus crops identified under the programme include Mango, Cashew, Kokum, Noni, Banana, Pineapple, Black Pepper, Nutmeg, Medicinal Plants, Orchids and Anthurium.

Major activities being undertaken in the programme are production and distribution of planting material, vegetable seed production, area expansion, rejuvenation of old and senile orchards, creation of community water resources, protected cultivation, IPM/INM, organic farming, pollination support, development of post harvest management & marketing infrastructure and human resource development.

## Physical Programme

Salient programme till 2012-13 is as follows:-

- An additional area of 9381 ha of identified horticulture crops are covered.
- 9 nurseries have been established for production of quality planting materials.
- An area of 4644 ha. has been covered under rejuvenation of old and senile orchards.
- Organic farming has been adopted in an area of 1288 ha for promotion of organic cultivation of horticultural crops.
- IPM practices have been adopted in an area of 96 ha.
- An area of 6 ha has been covered under protected cultivation.
- Under the component of Post Harvest Management, 2 units have been established.

## Financial Progress

An amount of Rs. 13.05 crore was released to the State till 2012-13 against which an expenditure of Rs. 13.39 crore has been reported.

## Progress during 2013-14

An allocation of Rs. 5 crore has been approved including GOI share of Rs. 4.25 crore for Annual Action Plan 2013-14. Funds to the tune of Rs. 4.00 crore has been released during the current financial year, out of which, an expenditure of Rs. 0.77 crore has been reported, till January, 2014. Main progress has been under the components of area expansion, protected cultivation, setting up of vermi compost units and HRD components.

(Rs. in crore)

Year	Outlay	Release	Expenditure
2005-06	7.88	3.15	1.13
2006-07	3.35	2.00	1.82
2007-08	1.27	0.03	1.54
2008-09	2.75	1.00	1.64
2009-10	3.36	1.50	1.46
2010-11	4.25	2.12	2.12
2011-12	2.98	2.00	2.39
2012-13	3.4	1.25	1.29
2013-14	4.25	4.00	0.77

The Team interacted with Director, Agriculture and Mission Director of Goa on 12<sup>th</sup> February, 2014 before proceeding to districts. Thereafter, the Team appraised the Director Agriculture about the observations and recommendations of the team on 15<sup>th</sup> February, 2014.

## **Strength, Weakness, Opportunity & Challenges (SWOC)**

### **STRENGTH**

- a) Climatic condition favors growing horticultural crops like cashew, Mango, banana and flowers crops like orchids and anthurium.
- b) Good network of road, rail, waterways and air.
- c) Demand-driven market due to increase purchasing power of the local people due to high per capita income and rapid industrialization/ urbanization in the State. The tourism sector is well developed for consumption of locally produced fruits and flowers.
- d) Existing network of department nurseries and implementation of nursery act for quality planting material.
- e) Convergence of the State government schemes for effective implementation of NHM.
- f) One among the major producers of cashew and has large collection of germ plasm and sufficient processing capacity for exports and local consumption.
- g) Limited use of chemical fertilizers & pesticides giving scope for large scale certification specially in cashew crop.

### **WEAKNESSES**

- a) Poor exposure of farmers and staff to modern practices.
- b) Open grazing practices causing damage to crops.
- c) Irrigation facility creation is limited & expensive due to uneven terrain
- d) Lack of well trained extension person at village level.
- e) Not self sufficient in fruits & vegetables. Has to rely on other States due to limited land area and climate factors.
- f) Small Land holdings make it difficult for mechanization and management of horticulture gardens.
- g) Also, due undulating terrain-mechanization is difficult.

## **OPPORTUNITIES**

- a) Scope for crop diversification from traditional paddy fallows in uplands to horticulture crops.
- b) Huge demand for fruits and vegetables.
- c) Presence of technical institutions like ICAR-Goa, two KVKs, may help in tapping modern knowledge in the field.
- d) Processing of produces for value addition to cater to the tourist population visiting the State.
- e) Establishing network for organized agri-business.
- f) Scope in productivity increase and farming technology enhancement as the same are below the maximum potential in the country.
- g) Potential to increase production and export of cashew by certification as organic.
- h) Vast potential for organic farming.
- i) Potential for agro-tourism.
- j) Vast tourist population is immediate buyer for fruits / vegetables

## **CHALLENGES**

- a) Excessive withdrawal of ground water will lead to ecological imbalance.
- b) Lengthy procedure to access credit facilities from banks de-motivates the farmers.
- c) Stagnation in production due to low level of interest in agriculture, depleting soil fertility due to erosion during heavy rains.
- d) Due to less than 15% engaged in agriculture and growth of other sectors like tourism, mining and industries the farm labours are not available or the wages are very high.

## **Status of Horticulture in Goa**

### **Main highlights of Horticulture in the State**

- Kokum is a unique crop of Goa State.
- Goa produces about 4.0% of cashew in the country.

### **NHM Scheme**

The Centrally Sponsored Scheme of National Horticulture Mission (NHM) is being implemented in 2 districts of Goa since 2005-06.

The programme in the State of Goa is being implemented by the State Horticulture Mission (SHM) through District Mission Committees involving farmers, Societies, NGOs, Grower Associations, SHGs, State Institutions etc. The district covered under the programme includes South Goa and North Goa.

The focus crops identified under the programme include Mango, Cashew, Kokum, Noni, Banana, Pineapple, Black Pepper, Nutmeg, Medicinal Plants, Orchid and Anthorium.

Major activities being undertaken in the programme are production and distribution of planting material, vegetable seed production, area expansion, rejuvenation of old and senile orchards, creation of community water resources, protected cultivation, IPM/INM, organic farming, pollination support, development of post harvest management & marketing infrastructure and human resource development.

### **Progress till 2013-14**

Salient physical progress till 2013-14 is as follows:-

- An additional area of 9738 ha of identified horticulture crops are covered.
- 9 nurseries have been established for production of quality of planting materials.
- An area of 4644 ha. has been covered under rejuvenation of old and senile orchards.
- Organic farming has been adopted in an area of 1288 ha for promotion of organic cultivation of horticultural crops.

- IPM practices have been adopted in an area of 96 ha.
- An area of 7 ha has been covered under protected cultivation.
- Under the component of Post Harvest Management, 2 units have been established.

An amount of Rs. 17.05 crore was released to the State till 2013-14 against which an expenditure of Rs. 14.71 crore was reported.

### **Progress during 2013-14**

An allocation of Rs. 5.00 crore has been approved including GOI share of Rs. 4.25 crore for Annual Action Plan 2013-14. Funds to the tune of Rs. 4.00 crore has been released during the financial year, out of which, an expenditure of Rs. 1.32 crore has been reported.

### **Programme for 2014-15**

- NHM activities have been subsumed under Mission for Integrated Development of Horticulture (MIDH) during XII Plan (w.e.f. 2014-15).
- An outlay of Rs. 5.50 crore including GOI share of Rs. 4.68 crore has been approved for the State to implement activities of NHM during 2014-15. An expenditure of Rs. 1.35 crore has been reported.



## State Wise Yearly Total Progress Report Physical/Financial Targets & Achievements

State : Goa

Financial Year : 2013-14

(Rs. in Lakh)

Component Name	Unit	Physical		Financial		GOI share
		Tar	Achm	Tar	Achm	
<b>A. PLANTATION INFRASTRUCTURE &amp; DEVELOPMENT</b>						
1. Production of planting material						
1.1 Nursery & TC units						
a) Public sector						
- Model Nursery (4ha)	No.	1	-	15.91	6.25	5.31
- Small Nursery (1 ha)	No.	1	-	5.31	0.00	0.00
2. Establishment of new gardens						
2.1 Fruits						
(a) Fruits (Perennial)						
• New plantation	Ha.	-	47.73	0.00	4.88	4.15
• 1 <sup>st</sup> year maintenance	Ha.	-	51.97	0.00	1.85	1.57
• 2 <sup>nd</sup> year maintenance	Ha.	-	35.09	0.00	1.16	0.99
(b) Fruits (Non-Perennial)						
• New plantation	Ha.	-	0.10	0.00	0.02	0.02
(c) Banana (sucker) & Papaya, etc.						
• New plantation	Ha.	25.00	34.91	3.59	5.89	5.01
• 1 <sup>st</sup> year maintenance	Ha.	13.00	29.15	0.62	1.64	1.39
(d) Fruit crops other than cost intensive crops using normal spacing, with integration						
• New plantation	Ha.	50.00	-	4.21	0.00	0.00
• 1 <sup>st</sup> year maintenance	Ha.	52.00	-	1.46	0.00	0.00
• 2 <sup>nd</sup> year maintenance	Ha.	36.73	-	1.03	0.00	0.00
2.2 Spices						
(a) Seed spices (cumin, fennel, etc)	Ha.	10.00	-	1.06	0.00	0.00
(b) Perennial spices (black pepper, cinnamon, clove and nutmeg)	Ha.	25.00	30.80	4.25	6.09	5.18
(c) Rhizomatic spices (Ginger, Garlic, Turmeric etc)	Ha.	-	0.40	0.00	0.05	0.04
2.3 Plantation crops including coastal horticulture, without integration						

(a) New Plantation	Ha.	250.00	243.36	25.50	29.20	24.82
(b) 1 <sup>st</sup> year maintenance	Ha.	94.00	160.43	3.20	6.42	5.46
(c) 2 <sup>nd</sup> year maintenance	Ha.	231.00	273.64	7.86	10.93	9.29
3.Protected cultivation						
3.1 Naturally ventilated						
(a) Tubular Structure (All Category Farmers)	Ha.	2.00	0.45	79.48	35.52	30.19
3.2 Shade Net House						
(a) Tubular Structure	Ha.	1.00	-	25.50	3.69	3.14
3.3 Plastic Tunnel	Ha.	0.50	-	0.64	0.00	0.00
3.4 Cost of planting material of high value vegetables grown in poly house	Ha.	1.00	-	4.46	01.00	0.00
3.5 Cost of planting material for flowers for poly house/Shade net	Ha.	2.00	-	42.50	3.69	3.14
3.6 Plastic Mulching	Ha.	50.00	-	4.25	0.00	0.00
4.Organic Farming						
4.1Adoption of organic farming						
(a) First Year	Ha.	-	-	0.00	0.00	0.00
4.2 Certification						
(a) Organic Certification (1st year)	No.	-	-	0.00	0.00	0.00
4.3 Vermi compost units(No.)	No.	20	21	5.10	4.59	3.90
5.Pollination support through beekeeping (Lakh units)						
5.1 Production of bee colonies by bee breeder	No.	300	-	1.78	0.00	0.00
5.2 Distribution of colonies with hives	No.	300	-	2.04	0.00	0.00
5.3 Equipment including honey extractor (4 frame), food grade container (30 kg), net, etc.	No.	6	-	0.35	0.00	0.00
6.HRD including Horticulture Institute						
6.1 Training of Field Staffs	No.	-	-	0.00	0.45	0.38
6.2Training of Farmers						
(a) Within the State	No.	1000	-	6.38	0.00	0.00
(b) Outside the State	No.	200	24	13.60	1.94	1.65
6.3Exposure visit of farmers						
(a) Within the State	No.	400	-	1.02	2.15	1.83
(b) Outside the State	No.	-	30	0.00	1.81	1.54
(c) within the District	No.	200	-	8.16	0.00	0.00
6.4 Training / Study tour of technical staff / field functionaries						
(a) Within the State	No.	30	-	1.32	0.10	0.09
(b) Outside the State	No.	-	7	0.00	5.37	4.56
(c) Outside India	No.	-	-	0.00	2.00	1.70

<b>B. INTEGRATED POST HARVEST MANAGEMENT</b>						
1.Refrigerated Transport Vehicles (9 MT)	No.	-	-	0.00	0.00	0.00
<b>C. Establishment of Marketing Infrastructure for horticultural produce in Govt./Private/Cooperative sector</b>						
1.Rural Markets/Apni Mandis/ Direct Markets	No.	-	-	0.00	0.00	0.00
<b>D. MISSION MANAGEMENT</b>						
1.State & Districts Mission Structure including additional manpower & project preparation cost	No.	-	-	20.00	0.60	0.51
2.Institutional Strengthening, hire/purchase of vehicles, hardware/software	No.	-	-	0.00	19.55	16.62
3. Seminars conferences, workshops, exhibitions, Kisan Mela, Horticulture Shows, Honey festivals etc.						
3.1 State Level	No.	-	-	0.00	0.00	0.00
<b>E. Misc. / Inovative Components not covered above</b>						
1.1	No.	-	-	109.21	0.00	0.00
<b>Grand Total (Financial Target &amp; Achievement)</b>				<b>399.79</b>	<b>155.84</b>	<b>132.48</b>

### Visit of JIT to North Goa

S. No.	Name of the Beneficiary	Address	Crop / Component	Year of Plantation / Start	Area in Ha./ Unit	Total unit planted	Survival as on date /status	Remark
1.	Lusindo Ferria	Manali, Thane Pan (North Goa)	AEP Banana G-9 + drip	2013-14	1.5	-	-	<ul style="list-style-type: none"> <li>• Subsidy availed.</li> <li>• Sigatoka disease present.</li> <li>• Pseudo stem not cut after harvest</li> <li>• Coconut bud rot is a serious problem (15-20%).</li> <li>• Red Palm beetle incidence was about 10%, advised properly.</li> </ul>
2.	Chandra Kant Mankar	Mololi Nagargaon (North Goa)	Vegetable cultivation, Chilli under NVI	2014-15	1.0	-	-	<ul style="list-style-type: none"> <li>• Wilt in chilli noticed under CV. Nishat.</li> <li>• Advised to use Trichoderma before planting.</li> </ul>
3.	Sanjay Tendulkar	Khodya, Pan. Pissurle (NG)	AEP of cashew & mango	2011-12	5.0	-	-	<ul style="list-style-type: none"> <li>• Leaf miner, and thrips noticed in cashew in CV. V-4</li> <li>• Drip is needed for irrigation.</li> </ul>
4.	Balkrishna Pednekar	Pan. & village Pissurle (NG)	AEP of vegetables under VIUC, chilli, Bhindi	2014-15	1.0	-	-	<ul style="list-style-type: none"> <li>• Thrip population is more in chilli.</li> <li>• Harvesting is done after 3-4 days.</li> </ul>

5.	Dinesh Singh Rane	Wadawal Bicholim (North Goa)	AEP of cashew without drip (cv. V-4)	2014-15	4.0 (7x7m)		776	<ul style="list-style-type: none"> <li>• Staking needed.</li> <li>• Drip to be provided</li> <li>• Plants are healthy.</li> </ul>
6.	Mrs. Noclin Mendonsa	SonarBhat Latanbarecam Bicholim (North Goa)	Poly house 1008 sqm x3 High value vegetables	2014-15	1008 sqmx3	-	-	<ul style="list-style-type: none"> <li>• Brinjal grafted on wilt resistant root stock and fruit borer.</li> <li>• New types of high value vegetables are grown.</li> </ul>
7.	B. Vargoankar	Model Thivim, Thivim	High Density Mango AEP local & other varieties	2014-15	1 Acre 3x3 m	473	470	<ul style="list-style-type: none"> <li>• Under HD about 14 cvs. Were planted, performance of cultivars is yet to be seen.</li> <li>• Double root stock plants have been planted.</li> <li>• Drip supplied by authorised agency was not good.</li> <li>• Subsidy Rs. 10400/ availed.</li> <li>• More agencies to be considered for supply of drip instead of single agency for entire state.</li> </ul>

South Goa District

S. No.	Name of the Beneficiary	Address	Crop / Component	Year of Plantation / Start	Area in Ha./ Unit	Total unit planted	Survival as on date /status	Remark
1.	Shaikh Abul Hassan (Samridhi Nursery)	Vailowado Sanghuem (South Goa)	Poly house Tomato & chill and other high value vegetables	2013-14	2016 sm.	-	-	<ul style="list-style-type: none"> <li>• Subsidy Rs. 10 lakhs availed.</li> <li>• Tomato seedlings died due to wilt (35%).</li> <li>• Viral &amp; leaf spot problem in chilli noticed.</li> </ul>
2.	Mohm. Issak Shaikh	Vailowado Sanghuem (South Goa)	Poly house, 1008 sqm. (chilli)	2013-14	1008 sqm	-	-	<ul style="list-style-type: none"> <li>• Subsidy availed.</li> <li>• Leaf spot was very serious.</li> <li>• Crop is good harvesting started and marketed through Goa State Horticulture Corporation.</li> </ul>
3.	Shaikh Ashraf Ali	Vailowado Sanghuem (South Goa)	Poly house 2016 sq.m. Gerbera (cv. Dakota)	2014-15	2016 sqm	-	-	<ul style="list-style-type: none"> <li>• Subsidy availed.</li> <li>• About 15% plants died due to Fasarial wilt.</li> <li>• Leaf miner was quite high.</li> <li>• Good crop.</li> </ul>

4.	M/s Timblo plantation	Uguem, Sanghuem Taluk (South Goa)	Open pollinated chilli (cv. Nisha) cultivation, AEP.	2014-15	2 acre	-	-	<ul style="list-style-type: none"> <li>• Subsidy given as 20PKT seed of chilli, Typical yellow vein type &amp; crinkle noticed.</li> <li>• Crop growth is very good and maintained nicely.</li> </ul>
5.	Mingelin D. Costa	Uguem Sanguem (South Goa)	AEP of cashew (V-4)	2012-13	1.0	200	-	<ul style="list-style-type: none"> <li>• Subsidy amount paid to beneficiary.</li> <li>• Plant growth is not good due non availability of water, advised to have drip soon.</li> </ul>

# PHOTOGRAPHS



## JIT Goa



Tomato seedlings damaged by wilt



Chilli cultivation under Polyhouse

## JIT Goa



Discussion with beneficiary on disease problems of Gerbera



Open chilli cultivation with mulch

JIT Goa



Virus affected chilli seedlings



Chilli seedling grown in open nursery

