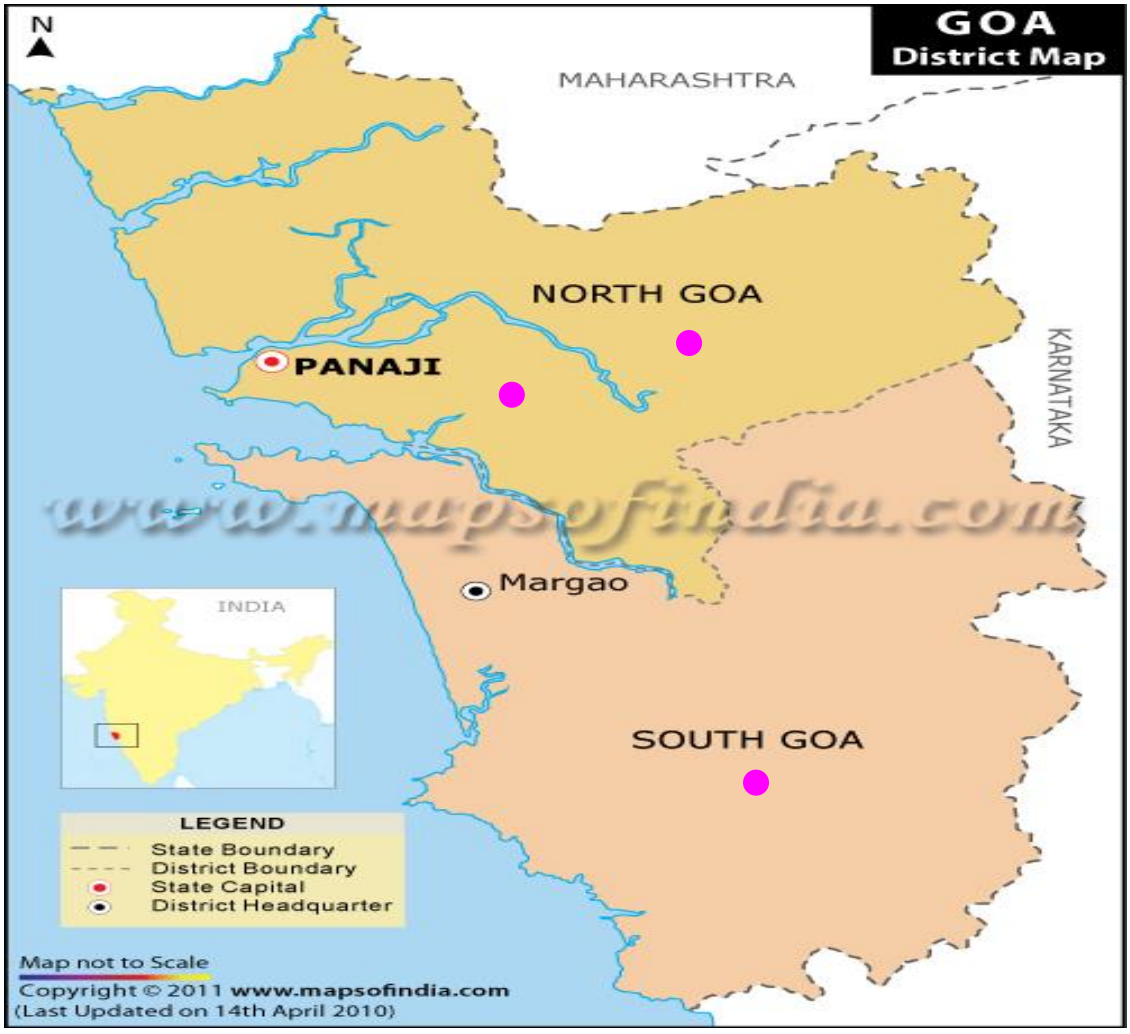
Report of the Joint Inspection Team on its visit to Goa during 12th to 15th February, 2014 to review the progress under the National Horticulture Mission



Districts visited by J.I.T of National Horticulture Mission

National Horticulture Mission

Ministry of Agriculture

Department of Agriculture & Cooperation

Krishi Bhawan, New Delhi-110001

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OBSERVATIONS

- Goa climatic conditions favour growing of horticultural crops like cashew, mango, banana, papaya, mangosteen and flowers crops like orchids anthurium, and carnation.
- It has been observed that more focus needs to be given on improvement of productivity through rejuvenation of old and senile orchards of cashew and mango, target for the same needs to be enhanced.
- Nurseries being set up under Public / Private Sector with an assistance of NHM should have permanent infrastructure besides mother block for producing elite material.
- The cucumber grower informed JIT that the crop is sold @ Rs. 5-6 kg in the market during peak tourist season, resulting in heavy losses.
- Chilli seedlings supplied by the Department under VIUC was badly affected with viral problems leads to stunting, puckering and curling of foliage.
- Creation of water resources has been a major sector in transforming the economy of the local people. NHM provides assistance for taking up water resource development as community based activity as well as in individual field, which need to be promoted.
- The ripening chamber (5 Nos) and one cold room developed by the private owner at APMC yard, Ponda, was found underutilized due to non availability of produce. It is strange to note that banana and mango are still being ripened with banned chemicals by the local vendors.
- In Goa, banana appears to be the major attraction for cultivation.
- Capacity building through HRD, training and demonstration will have to be taken up extensively, particularly training to the farmers for adopting modern Technologies as most of farmers are taking up Horticulture venture for the first time.
- Overall progress of implementation of NHM programme is satisfactory under AEP, VIUC and protected cultivation.

ACTIONABLE ISSSUES

- Effort should be made to integrate other scheme such as MGNREGS, RKVY, watershed development programme for augmenting horticulture programme, in the State.
- Income generating activities such as vermi compost units, beekeeping and mushroom need to be promoted. There is an overwhelming response for adoption of organic farming, protected cultivation in the State, which need to be supported with additional allocation of funds. Also advised to grow vegetable seedlings under protected tunnel instead of open field to avoid viral problems.
- Rejuvenation and replacement of senile mango / cashew plantation needs to be taken up on priority basis. Farmers may also be provided proper training and basic implements for management of senile plantation, in this case technical staff needs to supervise with periodic visits on the sites.
- Vegetable growers need training on adoption of plant protection measures i.e. Integrated Pest management (IPM) which is of utmost importance to minimize pesticide load in food chain.
- Practice to ripening banana/ mango with banned chemical needs to be stopped.
- Nurseries need to be accredited for production of quality planting material. The system of production and supply of quality planting material, particularly for fruits like mango and cashew etc. needs to be streamlined.
- Area expansion programme of banana is mostly through suckers. Good scope exists for promoting the tissue culture banana with micro irrigation, which would help in enhancing productivity and quality of crops. State also needs to promote tissue culture unit for production of banana plants that would help to promote underutilized ripening chamber located at Ponda
- Success stories along with annual training calendar for HRD activities need to be prepared yearly.
- Appropriate size sign board with NHM logo indicating the details containing name of beneficiary, activity, crop undertaken need to be displayed at all sites established with an assistance of NHM.

Report of the Joint Inspection Team on its visit to Goa during 12th to 15th February, 2014 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 12-15th 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. Olavio Fernandez, DDA (Hort.), Directorate of Agriculture, Tonca, Caranzalem, Nevil Alphonso, ADA (Coconut), Directorate of Agriculture, Tonca, Caranzalem, Audhut P. Sawant, A.P.O. (Cashew), Directorate of Agriculture, Tonca, Caranzalem, Dilip M. Paranjape, Nodal Agriculture Officer, Mapusa, Shri Anant Hobile, Zonal Agriculture Officer, Bicholim, Sandeep Faldesai, Zonal Agriculture Officer, Margao. Agriculture/Horticulture Department of Goa joined the inspection team. A meeting was also held with Shri P. Tufani, Director (Agriculture) and Mission Director, SHM, Goa on 12th & 15th February, 2014 at Caranzalem, Goa.

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, Potato cultivation, vermi compost unit, Nursery, Ripening chamber, cashew processing unit, vegetable seed production

NMMI- Drip irrigation in mango, cashew, Banana

VIUC-Area Expansion, protected cultivation and formation of FIG

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 4 humid tropical climate. The summer temperature ranges from 24^0C to 30^0C. 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 posses 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 “Communidade” 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 communidade 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.

Total area for land utilization	**361113**
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%
Total cropped Area	**169518 – 46.94%**

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 stags 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.

Production of Plating Material

Under National Horticulture Mission (NHM), 3 Modal 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.

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 were 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.

Reference to the referred letter No. F.No. 33-45 (4) /2013-Hort., dated 11:02:2014-02-25 the reply to the observations are as follow:

1. SHM has not initiated the establishment of nurseries in the private sector so far. Approved targets needs to be implemented with the available funds of Rs. 10.43 lakh. During 2013-14, an expenditure of Rs. 5.31 lakh has been reported for setting up of Model Nursery in Public Sector. Corresponding physical achievement needs to be posted.

Ans. Efforts are being made to encourage Nurseryman in the Private Sector to improve their infrastructure facilities by availing the subsidy provided under the NHM Programme.

2. SHM has reported an expenditure of Rs. 7.15 lakh under horticulture mechanization against approved targets of Rs. 6.60 lakh in AAP 2010-11. In this regard, SHM, needs to furnish the minutes of SLEC meetings wherein those targets have been accorded the approval.

Ans: - Under Horticulture Mechanization Component the expenditure of Rs. 7.15 lakh was incurred after obtaining permission from Government of India (permission was conveyed by the Deputy Commissioner (NHM) vide letter No. 33-22/2010-Hort; dated 7th March, 2011.

3. Till 2012-13, one (1) rural market with an outlay of Rs. 3.19 lakh was approved SHM may furnish the status regarding the rural market.

Ans. As the Municipal Corporation of Sanquelim could not submit their project proposal; the rural market project was dropped. Efforts are being made to promote a new rural market.

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, Government of Goa, Codar

   Model Nursery, Krishi Vigyan Kendra, ICAR, Goa

2) Private Nurseries- Sidharth Nursery, Sal Bicholim Samrudhi Nursery, Vikas Nursery

3) Research Stations- Regional Fruit Research Station, Konkan Krishi Vidyapeeth, Vengurla, University of Agri Sciences, Dharwad

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

State : Goa Financial Year : 2012-13 (Rs. in Lakh)

Component Name	Unit	Physical		Financial		GOI share
		Tar	Achm	Tar	Achm	
A. PLANTATION INFRASTRUCTURE & DEVELOPMENT						
1.Production of planting material						
1.1Planting Material						
(a) Public sector						
-Model Nursery	No.	-	-	0	0	0
2.Establishment of new gardens						
2.1Fruits						
(a) Fruits (Perennial)						
• New plantation	Ha.	-	57.79	0	5.2	4.42
• 1st year maintenance	Ha.	-	40.89	0	1.34	1.14
• 2nd year maintenance	Ha.	68.04	64.75	1.91	2.12	1.8
(b) Fruits (Non-Perennial)						
• New plantation	Ha.	-	6089.1	0	4.81	4.09
• 1st year maintenance	Ha.	-	44.53	0	2.51	2.13
• 2nd year maintenance	Ha.	-	43.0	0	2.42	2.06
(c) Banana (sucker) & Papaya,etc.						
• New plantation	Ha.	25	20.51	3.59	3.46	2.94
• 1st year maintenance	Ha.	44	-	2.1	0	0
(d) Fruit crops other then cost intensive crops using normal spacing.						
• New plantation	Ha.	40	-	3.37	0	0
• 1st year maintenance	Ha.	48	-	1.35	0	0
2.2Spices						
(a) Seed spices(cumin, fennel, etc)	Ha.	5	-	0.85	0	0
(b) Perennial spices (black pepper, cinnamon, clove and nutmeg)	Ha.	-	34.96	0	6.62	5.63
(c) Rhizomatic spices (Ginger, Garlic, Turmeric etc)	Ha.	5	-	0.53	0	0
2.3 Plantation crops including coastal horticulture						
(a) New Plantation	Ha.	175	95.96	17.85	17.68	15.03
(b) 1st year maintenance	Ha.	438	298.28	14.89	12.06	10.25
© 2nd year maintenance	Ha.	510	523.72	17.34	20.96	17.82
3.Rejuventation/ replacement of senile plantations	Ha.	35	70	4.46	4.24	3.6
4.Protected cultivation						
4.1Green House						

(a) Tubular Structure	Ha.	0.25	-	9.93	0	0
4.2 Plastic Tunnel	Ha.	0.5	-	0.26	0	0
4.3Shade Net House						
(a) Tubular Structure	Ha.	0.5	0.08	12.75	2.51	2.13
4.4 Cost of planting material for flowers for poly house/Shade net	Ha.	0.57	-	12.11	0	0
5.Organic Farming						
5.1Adoption of organic farming						
(a) Third Year	Ha.	-	308	0	9.19	7.81
5.2 Vermi compost units(No.)	No.	10	-	2.55	0	0
5.3Certification						
(a) Organic Certification (1st year)	No.	-	-	0	0	0
(b) Organic Certification (2nd year)	No.	-	-	0	0	0
(c) Organic Certification (3rd year)	No.	-	302	0	30.77	26.15
6.Pollination support through beekeeping						
6.1 Production of bee colonies by bee breeder	No.	150	-	0.89	0	0
6.2 Distribution of colonies with hives	No.	100	350	0.68	8.19	6.96
6.3 Equipment including honey extractor (4 frame), food grade container (30 kg), net, etc.	No.	10	-	0.59	0	0
7.HRD including Horticulture Institute						
7.1 Training of Field Staffs	No.	-	1	0	0	0
7.2Training of Farmers						
(a) Within the State	No.	300	-	2.66	0	0
(b) Outside the State	No.	60	90	2.65	0	0
(c) Within the District	No.	-	1000	0	0.99	0.84
7.3Exposure visit of farmers						
(a) Within the State	No.	150	-	4.59	0	0
(b) Within the District	No.	300	-	0.77	0	0
(c) Outside India	Project	-	2	0	1.35	1.15
7.4Training / Study tour of technical staff / field functionaries						
(a) Within the State	No.	40	-	1.7	0	0
B. INTEGRATED POST HARVEST MANAGEMENT						
1.Ref. vans /containers (6 MT)	No.	-	-	0	0	0
C. Establishment of Marketing Infrastructure for horticultural produce in Govt./Private/Cooperative sector						
1.Rural Markets/Apni Mandis/ Direct Markets	No.	-	-	0	0	0
D. MISSION MANAGEMENT						
1.State & Districts Mission Structure	No.	-	-	4.56	14.02	11.92

including additional manpower & project preparation cost						
2.Institutional Strengthening, hire/purchase of vehicles, hardware/software	No.	-	-	0	1.36	1.16
3. Seminars conferences, workshops, exhibitions, Kisan Mela, Horticulture Shows, Honey festivals etc.						
3.1 State Level	No.	-	1	0	0	0
Grand Total (Financial Target & Achievement)				**124.93**	**151.8**	**129.03**

National Vegetable Initiative for Urban Cluster (NVIUC)

Expenditure statement for the year 2012-13

Sr. No.	**Component**	**Physical Achievement**		**Expenditure**
		Unit	**No. of Units**	
1.	Vegetable cultivation (Open pollinated field)	Ha	100	12.87 lakhs
2.	Vegetable cultivation (Hybrid varieties)	Ha	20	
3.	Vegetable cultivation protected condition			
I	Green House Structure (pls specify type)	Sq. M	3680 sq. m	17.20 lakhs
II	Cost of planting material and other inputs of high value vegetables grown in green house / poly house / shade net house	Sq. M.	3680 sq. m	1.93 lakhs
4.	Promotion of IPM (area)	Ha	40	0.66 lakhs
			Total	**32.66 lakhs**

Status of area and production for 2013-14 in Goa

Sl No.	**Crops**	**Areas**	**Production**
1.	Banana	2.30	26.09
2.	Mango	4.78	9.13
3.	Pineapple	0.29	4.82
4.	Other fruits	3.83	41.30
	Total	**11.20**	**81.33**
5.	Vegetables	6.67	80.85
6.	Spices	0.73	0.23
7.	Plantation crops	85.43	120.36
(i)	Cashew	57.97	32.35
(ii)	Coconut	25.73	85.14
(iii)	Arecanut	1.73	2.87

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 12th February, 2014 before proceeding to districts. Thereafter, the Team appraised the Director Agriculture about the observations and recommendations of the team on 15th 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.

Visit of JIT to North and South Goa Districts

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.	Marietta Furtedo Fereira	Malkornem, Quepem, South Goa	Drip cashew, mango, sapota, Kokum coconut	2013-14	5.00	1500 6x5	99	• Advised to use drip frequently as cashew in under fruiting. • Also advised farmer to spray against Tea mosquito bug.
2.	Domnick Fernandes	Mal Kornem, Quepem, South Goa	Banana (AE) CV. Velchi	2011-12	2.2	5000	100	• The crop was not properly maintained having 5-6 suckers allowed to grow. • Advised to keep only one or two suckers, Taiwan Papaya planted in field having two-three seedling in one pit advised accordingly.
3.	Sunil A Ganpule	Parey, Sattary, North Goa	Naturally ventilated Poly house, Cucumber and Nursery (Cashew & mango)	2013-14	1008 sqm	Full produ-ction		• About 1.5 lakh plant prepared and sold to the farmers @ 30-50 per plant. • Attack of leaf miner and Downy mildew was very high in cucumber. • Unable to sale the produce in the market even @ Rs. 5/kg. • Total subsidy of Rs. 524160/- paid.
4.	Santosh V. Kelkar	Bambar, Nanoda Valpoi, Sattari, Noth Goa	Naturally ventilated poly house Capsicum cv. Indira (Green / Red)	2013-14	1008 sqm.	-do		• Subsidy of Rs. 5.04 lakh availed. • Farmer sale his produce to Goa State Horticultural corporation Ltd. • Heavy incidence of powdery

								mildew noticed and advised accordingly.
5.	Manjari Patil	Nirankul, Ponda North Goa	Naturally ventilated poly house (chrysanthi-mum)	2012-13	1344 sqm	Flower	-	• Subsidy Rs. 9.6 lakh availed • Flower chrysanthemum is new crop, yet to be bloom.
6.	Pratap Singh Abasaheb Rane	Catambarcem, Wadawal, Bicholim, North Goa	Nursery private Mango / cashew nut	2010-11	5.00	1000	-	• Availed Rs. 30,000 subsidy • Running cashew processing unit in the village • Nursery recognized by Goa Govt.
7.	Pratap Singh Apasahab Rana	Wondawal, Catambaram, Bicholim, North Goa	Banana (T.C.) G-9	2013-14	0.4	1000	95	• Subsidy Rs. 9000 availed by the farmer. • Gap filling still need to be done regularly due to monkey menace. • Boron need to be supplied in pits.
8.	Raquel Dias	Sangolda, Bardez North Goa (NVIUC)	Vegetable (1x0.3m) Drip	2013-14	0.23			• Proposed subsidy Rs. 42,000/- (under drip) is yet to be given to farmer. • Old chilli seedlings supplied by the Department, which have a viral problem. Advised accordingly. Bhindi crop damaged by leaf miner, advised accordingly.
9.	Mrs. Puspa Keonekar	Opa, Khandepur, Ponda, North Goa	Vermi compost unit	2013-14	-	-	-	• Subsidy amount Rs. 28296 under NHM and Rs. 14148 under State project availed. • Advised to produce vermi wash from vermi beds.

								• Advise to enrich the vermi compost by adding bio agents like *Trichoderma* / *Pseudomonas* etc. to control wilt / root disease in vegetables. • Assistance for Shredder also availed under State scheme (Rs. 37,500).
10.	Smt. Manjiri Patil	Nirankul Ponda North Goa	Naturally ventilated poly house	2013-14	1008 sqm.	-	-	• Subsidy amount Rs. 7.23 lakh availed. • Disease problem noticed in Gerbera. • Mites also found heavily, advised to control
11.	Ujwala, Majerekar	Bellavigta, Sangolda, Bardez, North Goa	Vegetables Brinjal, chilli under Drip	2012-13	0.4	-	-	• Brinjal / chilli crops are badly damaged by wilt advised accordingly. • Subsidy Rs. 66994 given on drip.
12.	Bala Krishnan	SBS cold Room, APMC Market, Shaikh Building, Ponda	Ripening chamber (6 chambers)	2011-12	6 room	6 rooms	-	• Subsidy Rs. 36 lakh availed. • Ripening chamber is underutilized due to non availability of banana as informed by owner. • T.C. banana needs to be grown around Goa.
13.	Govt. Farm Codar	Nursery- Govt. Farm, Codar Ponda						• It is very old Govt. farm having about 110 ha. Various kinds of fruit crops like cashew nut (6000), mango (16 cvs), 5000, Coconut (800) and oil palm are grown in 58 ha.

								• About 1 lakh grafted produced and sold every year. • Need upgradation in infrastructure, and technical support. • Air layering (in guava) is still done, advised for softwood grafting to be practiced.
14.	Kashinath Naik & Cluster of 1800 farmer under NVI	Consaulim Salcete, Margao	Vegetables & water melon (KYB, Augusta)	-	-	-	-	• Low lying paddy land is utilized for growing vegetables including water melon, which fetch good price in the market.

Wrap up meeting with the Director (Agriculture Goa)

Meeting to discussed the ongoing progress under NHM, RKVY, NMMI and VIUC in the State of Goa was held on 12th February, 2014, with P. Tufani, Director / Mission Director of Agriculture, Krishi Bhawan, Goa. Other officers viz. Dr. Olavio Farnandez, Deputy Director Agriculture, Nevil Alphonso, (ADA) and Shri A.P Sawant, APO participated in the meeting. Director was informed about the planting material plan indicating the requirement, and availability in the Goa and outsourcing, if any need to be given for ensuing season. Mother block for the nurseries should also established with more thrust on protected cultivation. Discussed the following points in the meeting.

1. Availability of crop Specific cluster in vegetables / flowers.
2. Management of Nurseries (private, public & Govt sectors) and their accreditation by NHB.
3. Vermi compost units and vegetable production under protected cultivation.
4. Micro irrigation programme and use of plastic in mulching, precision farming & timely release of budget etc. As informed by the Director that they did not receive the 2nd instalment of fund under NMMI.

On 15th February, attended the seminar on VIUC, i.e. Commercial cultivation of vegetable and flower held at Krishi Bhawan Auditorium at Krishi Bhawan, Tonca, Goa. The seminar was organized by Goa Chamber of Commerce (GCCI). Mr. Venkatesh Prabhudesai, Chairman, Agric Committee, GCCI, welcomed the president and presented the banquets to Shri Sripad Naik, Member of Parliament and Representatives of other department viz. Mr. Satish Tendulkar, Member Agriculture Committee, GCCI, Dr. N.D. Jambhale, Retired Prof. MPKV, Rahuri, Shri Gajendra Yadav, Area Manager, Kumar Biotech, Dr. P. Tufani, Director (Agriculture), Dr. Om Prakash, Chief Consultant (NHM) and Vegetable / Flowers farmers were also participated. Mr. R. S. Kamat, Director General, GCC proposed a vote of thanks to all participants.

As informed, Goa State has large floating population, which required fresh fruits and vegetables. The produce is imported from Karnataka, Maharashtra. There is demand-driven market due to increased 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.

In Goa, as informed that protected cultivation particularly for flower / vegetable cultivation is coming up in a big way, The State has taken steps to augment vegetable cultivation under protected cover under the scheme on vegetable Initiative for Urban clusters. Micro irrigation Technology is the need of hour to improve water use efficiency, which need to be promoted for horticultural crops. This technology needs penetration in the remotest area of Goa.

PHOTOGRAPHS

	
AEP of cashew nut	Under utilized Banana Ripening Chamber at Ponda
	
Vermi compost unit	Observing disease plants of Gerbera
	
Poly house	Cucumber under protected cultivation

Heavy incidence of leaf miner

Cashew Nursery

Powdery mildew in capsicum

Capsicum under protected cultivation

Borer in capscicum

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<tr><td colspan="2">Fungicides used for controlling capsicum diseases under poly house</td></tr>
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<tr><td>Raddish cultivation</td><td>AEP of Cashew nut</td></tr>
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<tr><td>Newly planted cashew under AEP</td><td>Cashew in fruiting</td></tr>
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Cashew apple	Stem Root borer infected Cashew nut plant
	
Cashew processing unit	Fresh Cashew nuts
	
Separation of cashew from cashew apple fruits.	Processing of cashew

JIT Goa

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<tr><td>Preparation of cashew liquor</td><td>Discussion with vegetable grower about management of disease / pest</td></tr>
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<tr><td colspan="2">AEP of banana under drip</td></tr>
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<tr><td>JIT discussing about problems in Rejuvenaiton of cashew</td><td>Polythene mulching in vegetable</td></tr>
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JIT Goa

Close up of mulching

Vegetable cultivation under drip (VIUC)

Vegetable production udner VIUC

Brinjal / chilli affected by wilt

JIT Goa

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<tr><td>Wilted Brinjal plant</td><td>Wilting in chilli</td></tr>
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<tr><td>JIT visiting vegetable field</td><td>Mulching in vegetable</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Vegetables under mulch</td></tr>
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