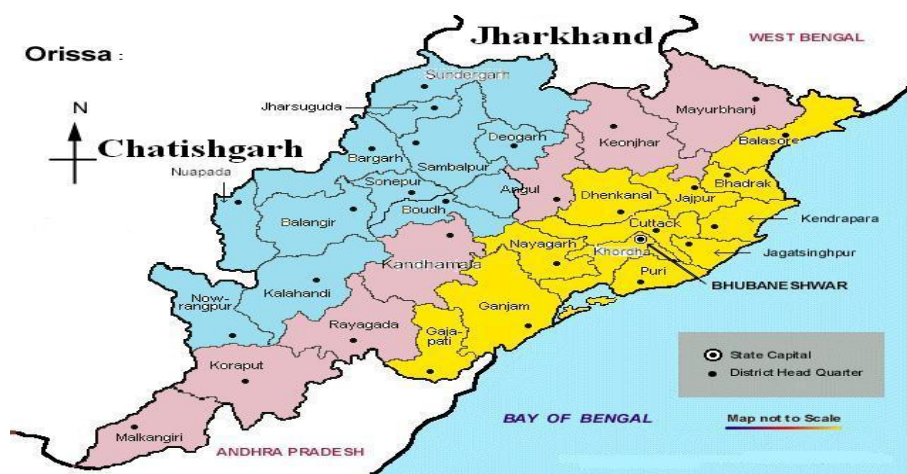


**Report of the Joint Inspection Team on their inspection visit to Khoda, Cuttack and Puri Districts of Odisha during September 2012(17 -22 September, 2012)**



**National Horticulture Mission**

**Department of Agriculture and Cooperation (DAC) ,**

**Krishi Bhawan, New Delhi**

**The joint Inspection Team (JIT) consisting of the following members visited during 17<sup>th</sup>-22 Sep.,2012 to Khoda, Cuttack and Puri districts of Odisha for monitoring NHM,RKVY,NMMI and NBI progress for the state of Odisha.**

1. Dr. R.C.Upadhyaya, Chief consultant (NHM), Ministry of Agricultural, Krishi Bhawan, New Delhi.
2. Dr. D.K. Dora, Professor and Head, PI, PFDC, Department of PHM, College of Agriculture, OUAT, Bhubaneswar, Odisha.
3. Sri R.R.Sharma, Assistant Commissioner, Dept. of Agriculture and Cooperation, Kishi Bhawan, New Delhi
4. Sri S.Raut, Assistant Director Horticulture (HQ), Representative from Directorate of Horticulture, Govt. of Odisha, Bhubaneswar, Odisha.

**Note:** District Officer of respective districts coordinated the field visits.

#### **Components of NHM, RKVY,NMMI and other programmes:**

- Crop specific cluster at district level.
- ☐ Nurseries management and progress including accreditation of nurseries.
- ☐ Vermin compost units under SHM.
- ☐ Flowers and vegetable production under protected conditions.
- ☐ Micro irrigation scheme and use of plastic in mulching, irrigation and precision farming.
- ☐ Placement of technical Staff at Management and also at field Level.
- ☐ Other activities and KVK, s support including Financial Progress: (Rs. in lakhs).
- National Mission on Micro Irrigation.
- National vegetable Initiative.

#### **Financial achievements – Year-wise (Fig. in lakh Rs.)**

Year	Central share receipt	State share receipt	Total	Expenditure
2005-06	3611.91	Nil	3611.91	599.21
2006-07	4450.00	Nil	4450.00	1711.61
2007-08	3812.16	659.07	4471.23	3016.75
2008-09	2341.00	412.94	2753.94	5922.57
2009-10	3500.00	617.64	4117.64	6405.32
2010-11	3259.00	575.11	3834.11	5434.98
2011-12	5355.00	944.99	6299.99	5119.70
<b>Total</b>	<b>26329.07</b>	<b>3209.75</b>	<b>29538.82</b>	<b>28210.14</b>

### Area and production of Horticultural Crops

Name of the Crop	Before NHM (2006-07)			After NHM 2007-08 to 2011-12		
	Area (Ha.)	Production M.T.	Productivity	Area (Ha.)	Production M.T.	Productivity
Mango	6750	28269	4.19	8900	48950	5.5
Cashew	4600	3450	0.75	6750	6410	0.95
Guava	240	2704	11.27	250	2800	11.2
Citrus	895	7782	8.7	950	8550	9
Litchi	6	18	3	10	27	2.7
Sapota	72	285	3.96	75	290	3.87
Banana	408	5141	12.6	410	5830	14.22
Coconut	1508	51 Lakh nuts	3382 nuts per Ha.	1700	71 Lakh nuts	4176 nuts per Ha.
Papaya	20	197	9.85	30	310	10.34
Pineapple	23	234	10.17	25	250	10
Others	1266	10881	8.6	1266	10881	8.6
<b>Total</b>	<b>15788</b>	<b>58961 &amp; 51 Lakh nuts.</b>	<b>4.12</b>	<b>20366</b>	<b>84928 &amp; 71 Lakh nuts.</b>	<b>4.5</b>

### Major cumulative achievements under NHM during 2005-06 to 2011-12

Fruit Plantation	146537.43 ha.
Vegetable seed Production (Distribution of Vegetable minikit)	1125000 nos.
Spices	7468.13 ha.
Nursery	121 nos.
Floriculture	11292.59 ha.
Vermi compost	3416 nos.
Training & Visit of Farmers	22363 nos.
Onion Storage Structure	3795 nos.

Aggregator for NVI trade as Udyan Fresh (Ref.Van) and retail A.C. outlet



### **General observations of JIT:**

- Overall progress of implementation of the programme in the State is satisfactory and needs for focus on Post Harvest Management and Marketing. More focus is needed on vermin composting, bee keeping, rejuvenation, mechanization and protected cultivation. Vermin compost unit design may be taken from [agri.university/ICAR](http://agri.university/ICAR).
- Farmers may be provided technological and input support for intercropping in newly established orchards to get additional income per unit area. Gap filling in the new orchards may be done timely both in the first and second year before payment. Planting material of same varieties may be supplied from accredited nurseries.
- Private sector nurseries as per guidelines of NHM are performing well. They are producing good quality planting material to cater the need of planting material. Nurseries established should be properly leveled with Varieties, date of sowing seeds, date of grafting and method of grafting etc. and should be accredited by National Horticulture Board. It is suggested that field functionaries posted at Govt. nurseries should have agriculture back ground preferably agriculture graduate.
- Under rejuvenation of cashew and mango, mostly canopy management may be taken up along with application of inputs. Rejuvenation/replacement of senile plantations is urgently needed of old and declined orchards of mango and cashew. Use of power saw would be needed at such locations.
- Adequate training need to be imparted to the beneficiaries availing subsidy for micro irrigation system. Post installation maintenance need to be ensured. Training on fertigation scheduling and application is also needed.
- It was observed that farmers are having small land holding and needs small tractors which are very convenient in pre-sowing field operations and also intercultural operations. Small tractors up to 10HP may be included in mechanization programme of the NHM.
- Cluster approach is not maintained in districts. Puri is low lying area adjoining sea shore (Eastern Ghat belt) and have limited scope for area expansion programme for fruit crops.
- Since farmers are not aware about NHM, NMMI and other central sponsored schemes It is suggested that awareness programmes /activities have to be

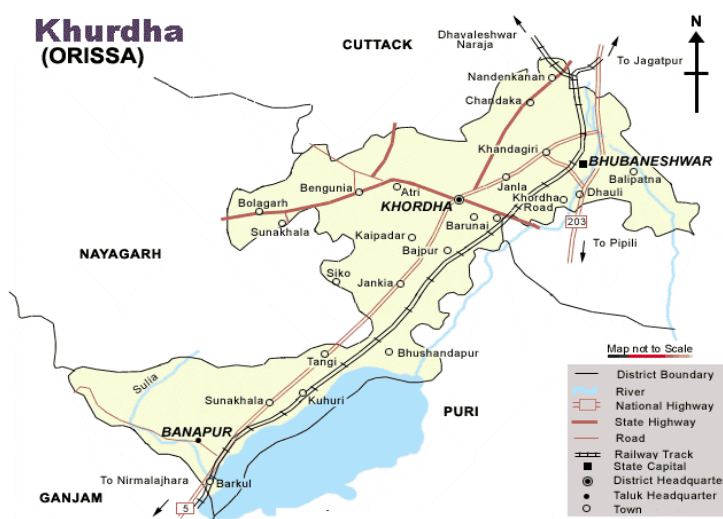
generated among the people through more intensive training programmes, and also print & electronic media.

- Coconut Seedlings of high yielding varieties to be supplied under C.D.B. programmes in all districts and more demonstration plots to be established in clusters.
- To make NHM more visible, display board along with the NHM logo need to be fixed in all fields of the beneficiaries.
- Tissue culture lab should be establish and strengthened existing one to provide disease free plant material of Banana in large scale to meet the demand of the farmers.
- Front line demonstration may be initiated in large number on pollination support through beekeeping in horticultural Crops to understand the role of Bee's as pollinator to enhance the crop productivity. The farmers may also be trained in the techniques of handling bee, transferring the hives and extraction of honey.
- It is suggested that interface interaction meetings may be organized with KVK's ,ICAR institutes and University to adopte location specific technical recommendation in farmers field. Officers and technical staffs also need refreshers training regularly at ICAR/CSIR institutions, SAUs.
- It was obseved by JIT that mushroom spawn programme was given to private sector who was not having technical expert for spawn production.It is suggested that spawn productio may be given in private sector where they have competant experts for such a highly technical work.
- It is suggested that M.O.U. may be done with poly house construction firms for maintenance of poly houses for two years.



## Khurda District :

The district is situated approximately 19 degree 40' to 20 degree 25' of North Latitude and between 24 degree 55' to 36 degree 5' of East longitude. The district is surrounded by Cuttack district in North and North-East, Nayagarh district in West, Puri district in south and by Ganjam district in South-West. The Chilika Lake is located in the south of the district. As per 1991 census the total population of the district is 15, 02,014 and the growth rate is 2.4 % per annum. The district of Khurda came into effect from 1st April, 1993 having been carved out of the erstwhile Puri district. The district is having 2 administrative Sub-divisions namely Khurda & Bhubaneswar, 10 Blocks, 7 Tahasils, 5 U.L.Bs, 23 Police Stations, 168 Grama Panchayats and 1567 revenue villages. The district of Khurda came into effect from 1st April, 1993 having been carved out of the erstwhile Puri district. Later on in the year 2000 the District name is changed as KHORDHA.



## DISTRICT PROFILE

1. Total Geographical Area of the District: 2887.50 Sq. Kms.

2. Total Population (as per 2001 Census) : 18,77,395

3. No. of Sub-Division: 02

(i). Khordha (ii) Bhubaneswar

4. No. of Blocks: 10

Khordha Sub-Division

Bhubaneswar Sub-Division

(i) Banpur

(i) Baliana

- |                |                   |
|----------------|-------------------|
| (ii) Begunia   | (ii) Balipatna    |
| (iii) Bolagarh | (iii) Bhubaneswar |
| (iv) Chilika   | (iv) Jatni        |
| (v) Khordha    |                   |
| (vi) Tangi     |                   |

5. Geographical Area : 281300 ha.

6. Cultivated Area : 138321ha.

i) High Land : 32505ha.

ii) Medium Land : 43338ha.

iii) Low Land: 48807ha.

7. Barren and unculturable Land:14467ha.

8. Forest Area: 61867ha.

9. Land Put to non-Agril. Use :46299ha.

10. Flood prone Area : 7888ha.

11. Rainfed Area : 71305ha.

12. Irrigated Area : 84309ha.

13. Normal Rainfall : 1408 mm.

14. Temperature :

(i) Maximum : 41.4 deg. Celcius

(ii) Minimum : 9.5 deg. Celcius

### **Climate and Soil:**

The climate of the district is tropical, characterized by high temperature, high humidity, medium to high rainfall and a mild winter. The normal rainfall is 1482.2 mm distributed over 72 rainy days. South West monsoon contributes about 81-83 % of the annual rainfall in 55-60 days during June-September. The annual temperature of the district is maximum, of 44.6° C and minimum, of 11.1° C.



The soil types differ widely from highly acidic to slightly alkaline and from light sandy to stiff clays. The soils are mainly acidic with the degree of acidity varying widely. Out of the cultivable area 258907 ha, about 54774 ha during Kharif and 9790 ha during Rabi is under irrigated condition (Kharif 18.5 lakh ha. + Rabi 8.5 lakh ha.) and 67% in non-irrigated. Khurda district on the basis of soil, climate topography, geohydrology and other resources are divided into two district sub-regions consisting of the following blocks as given below.

### **1. Deltaic Alluvium Sub-regions:**

Three Blocks namely, Balipatna, Baliana and Chilika came under Deltaic Alluvium Sub-region.

### **2. Laterite Sub-regions:**

Remaining 7 Blocks i.e. Bhubaneswar, Begunia, Bolagarh, Jatni, Khurda, Banpur and Tangi came under laterite sub-region.

#### **Soil Structure:**

Sandy Loam: 57943 ha., Loam: 25056 ha., Clay Loam: 15127 ha., Clay: 16500 ha.

### **Potential for Horticulture:**

The agro-climatic diversity in the district with its high rain fall distributed over a four-month monsoon and a reasonably moderate winter allows for growing a variety of horticultural crops. The agro-climatic conditions are immensely suitable for perennial fruit crops like mango, guava and Kagzi-limes; annual fruit crops like banana, pineapple and papaya; spices like ginger, turmeric and chilly, a variety of root and tubers and a whole range of vegetables. Of late floriculture is also showing excellent prospects. The district thus enjoys a natural comparative advantage for horticulture with possibilities for growing a diversified basket of fruits, vegetables, spices, tubers and flowers; whose potential has not been fully exploited.

**Area and Production of Horticulture Crops**  
**BLOCK WISE AREA, YIELD & PRODUCTION OF HORTICULTURAL CROPS IN**  
**Khordha DISTRICT**

	Vegetables			Condiments			Fruit Crops			Flowers		
	Area (Ha)	Yield (T)	Production	Area	Yield	Production	Area	Yield	Production	Area	Yield	Production
1	2	3	4	5	6	7	8	9	10	11	12	13
Khordha	377	96.26	36290	227	14.11	3203	1898	4.30	8161.4	8.4	8.4	70.56
Tangi	415	94.63	39271	303	13.47	4081.4	1440	5.2	7488	10.2	9.5	96.9
Begunia	1080	96.34	104047	79	14.52	1147	1633	6.1	9961.3	6.4	8.7	55.68
Bolagarh	550	97.77	53773	893	12.38	11055	1846	4.2	7753.2	9.5	8.3	78.85
Banapur	1011	92.89	93911	142	13.31	1890	1727	4.8	8289.5	6.2	8.5	52.7
Chilika	508	91.65	46558	139	15.29	2125	1269	4.2	5329.8	5.8	7.2	41.761
Balipatna	2072	94.18	195140	159	12.49	1986	1150	5.7	6555	12.4	9.1	112.84
Balianta	2214	94.63	209510	245	18.76	4596.2	1098	6.8	7466.4	10.8	9.7	104.76
Jatani	206	94.57	19481	55	11.05	607.75	1363	5.6	7632.8	6.2	8.7	53.94
Bhubaneswar	1707	95.07	162284	324	9.88	3201.12	1556	7.1	11047	7.3	8.8	64.24

**YEAR WISE ACHIEVEMENT OF HORTICULTURAL PROGRAMME**

**IN KHORDHA DISTRICT-2005-06 TO 2011-12**

SI No.	Name of the Scheme NHM	Achievement							
		2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Total
1	Cashiew Plantantion (in.ha)	147.12	330.5	459.4	353	264	270	275	2099.02
2	Mango Plantantion		248	449	368	560	300	225	2150

	(in ha.)								
3	Banana Sucker(in ha)	117	106	99	100	95	72.4	50	<b>639.4</b>
4	Banana Tissue Culture (in.ha)				6.6	7.7	1.01	0.8	<b>16.11</b>
5	K. Lime Plantation in.ha			23.5	12.4	40			<b>75.9</b>
	Total								<b>4980.43</b>

### **Nursery/ Farm / HDPO and their Capacity**

#### **a) Quality Planting Materials Production Centre (Departmental)**

<b>SI No</b>	<b>Name of the Production centre</b>	<b>Location</b>	<b>Crop Produced</b>	<b>Potentiality</b>
1	Derrace Farm	BBSR	Mango K.Lime	50000 25000
2	HDPO Khandagiri Farm	BBSR	Mango K.Lime Coconut	50000 15000 20000
3	Nimuna Farm	Chilika	Coconut K.Lime	10000 10000

### **Available Infrastructure facilities-**

#### **MARKETS-**

Local Market : - 45  
Regulated : - 01  
Un-regulated :- 57

**Cold Storage = 3**

### **Processing Units**

<b>SI.No</b>	<b>Name &amp; Address</b>	<b>Products</b>
1.	C.C.Centre, Khordha	Fruits & Veg
2	C.C.Centre, BBSR	-do-

**Field visit (Performance enclosed)**

1. Sadasib Mohapatra, AT/Po- Paikatigiria, Tangiapada, Aonla+Bael, 1 ha.+1 ha.
2. Gobinda Naik & 21 others Beneficiaries, At/Po-Haladipada, Nalpada Arjunpur, khurdha, Cashew, 22 ha.
3. Sadashiv Mahapatra, Village Tangiopada (Khurda) Establishment of Medicinal nursery under NMMP, Bael, Aonla, Aswagandha, Kalmegh
4. Subrat Ranjan Prusty, MGM Agriventure Pvt.Ltd., Gerbera, 0.4ha.
5. Lalatendu, Indrajit, At/Po- Bhusabanda, Kuhudui, Tangi, Mango, 4ha.
6. MGM-AGRI-VENTURE PVT. LTD./SUBRATA RANJAN PRUSTY, Gerbera, Rose in poly house(4000sq.mt..)

**Check list for Reviewing Progress on Area Expansion and Rejuvenation**  
**Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name and address of beneficiary whose field visited	Sadasib Mohapatra, AT/Po- Paikatigiria, Tangiapada
2	Total land available with the beneficiary (ha)	1 ha.+1 ha.
3	Crop cluster under which covered	Aonla+Bael
4	Name of the Project	Establishment of Small Nursery, Khordha
5	Source of planting material	Supplied by directorate
6	Number of plants planted	200 plants(A)+200plants(B)
7	. Date of planting	30.07.2011
8	Number of plants which survived (Also indicate percentage survival)	75%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs)	200000/- (Back ended subsidy Khordha, Bhubaneswar)
10	Amount paid and date of payment	22.08.2012
11	Mode of Payment	cheque
12	Source of irrigation water	Bore well
13	Whether Drip, System in use	Yes
14	Other inputs provided	Shadenet house, Compound wall
15	. Whether assistant availed for organic farming	No
16	. If so, area covered	
17	Assistance availed	
18	Available marketing facility for the crop	
19	Other infrastructure available in the vicinity	Compound wall, Land Development
20	General upkeep of the plot (Very Good/ Good/Average/ Poor)	Need proper maintenance and nursery labelling in nursery area.
21	Any other relevant observation by the J.I.T	
22	Whether NMMP Logo displayed	

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HOD, PFDC /    Asst. Director of NHM  
Prof. Vegetable    New Delhi

Dr. R.C. Upadhyaya  
Chief Consultant of NHM  
New Delhi

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name and address of beneficiary whose field visited	Gobinda Naik & 21 others Beneficiaries, At/Po-Haladipada, Nalpada Arjunpur, khurdha
2	Total land available with the beneficiary (ha)	22 ha.
3	Crop cluster under which covered	Cashew
4	Name & variety of crop planted	V 4
5	Source of planting material	Supplied by directorate
6	Number of plants planted	44000
7	. Date of planting	24.06.2009
8	Number of plants which survived (Also indicate percentage survival)	98%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs)	171600
10	Amount paid and date of payment	22.10.2008/25.09.2009/30.08.2010
11	Mode of Payment	Subsidy Reserve fund amount
12	Source of irrigation water	Bore well
13	Whether Drip, System in use	Yes
14	Other inputs provided	Shadenet house , Compound wall
15	. Whether assistant availed for organic farming	No
16	. If so, area covered	
17	Assistance availed	
18	Available marketing facility for the crop	Yes
19	Other infrastructure available in the vicinity	Compound wall , Land Developement
20	General upkeep of the plot (Very Good/ Good/Average/ Poor)	Good
21	Any other relevant observation by the J.I.T	
22	Whether NMMP Logo displayed	good

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HOD, PFDC /    Asst. Director of NHM    Chief Consultant of NHM  
Prof. Vegetable    New Delhi    New Delhi

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

**Establishment of Medicinal nursery under NMmp**

SL No.	Details	Remarks
1	Name of the Project	Establishment of Medicinal nursery under NMMP
2	Year of Implementation	2011-12
3	Project Period	3 years
4	Name of Implementing Agency	Asst. Director of Horticulture, Khordha
5	Location of Project	Paikartigiria, Khordha
6	Total project cost	Rs.4,00,000
7	Amount released by DAC	Rs.2,00,000 Back ended subsidy
8	Expenditure incurred	Rs.2,00,000 Back ended subsidy
9	Status of Project	Under progress
	Name of Nursery & crops for which plants are produced	Bael , Aonla, Aswagandha, Kalmegh
	Name of crops for which seeds produced	2nd year plants
	Quantity produced	
	Quantity sold	
	Rate	
	Amount realizes through sale	
	Whether NHM logo displayed	Yes

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HOD, PFDC /	Asst. Director of NHM		Chief Consultant of NHM
Prof. Vegetable	New Delhi		New Delhi

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name and address of beneficiary whose field visited	Subrat Ranjan Prusty, MGM Agriventure Pvt.Ltd.
2	Total land available with the beneficiary (ha)	0.4 ha.
3	Crop cluster under which covered	Gerbera
4	Name & variety of crop planted	
5	Source of planting material	Pune
6	Number of plants planted	4000 Sq.m.
7	. Date of planting	10.01.2011

8	Number of plants which survived (Also indicate percentage survival)	100%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs)	10,00,000
10	Amount paid and date of payment	10,00,000 September 2012
11	Mode of Payment	Account payee cheque
12	Source of irrigation water	Drip
13	Whether Drip, System in use	Yes
14	Other inputs provided	Poly House, cool chamber.
15	. Whether assistant availed for organic farming	
16	. If so, area covered	
17	Assistance availed	
18	Available marketing facility for the crop	Pune, Bangalore, Bhubaneswar.
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/ Poor)	Very Good
21	Any other relevant observation by the J.I.T	
22	Whether NMMP Logo displayed	yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name and address of beneficiary whose field visited	Lalatendu, Indrajit, At/Po- Bhusabanda, Kuhudui, Tangi
2	Total land available with the beneficiary (ha)	4 ha.
3	Crop cluster under which covered	Mango
4	Name & variety of crop planted	Amrapalli , Lat sundari
5	Source of planting material	Diversion from Directorate
6	Number of plants planted	400
7	. Date of planting	28.07.2008
8	Number of plants which survived (Also indicate percentage survival)	90%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs)	44825
10	Amount paid and date of payment	44825(10.09.2008,23.10.2010,12.10.2010)
11	Mode of Payment	Account payee cheque
12	Source of irrigation water	Bore well,dug well
13	Whether Drip, System in use	No
14	Other inputs provided	
15	. Whether assistant availed for organic farming	



16	. If so, area covered	
17	Assistance availed	
18	Available marketing facility for the crop	Khordha
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/ Poor)	Very Good
21	Any other relevant observation by the J.I.T	
22	Whether NMMP Logo displayed	yes

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	Prof. Vegetable	New Delhi	New Delhi

**Farmers field visit:**

**(Poly House/Cold storage/CA Storage/ Ref.Van/ Primary/ Mobile processing unit)**

Sl No	Details	Remarks
1	Name of the Project	MGM-AGRI-VENTURE PVT. LTD./SUBRATA RANJAN PRUSTY
2	Year of implementation	2011-12
3	Project Period	
4	Name of Implementing Agency	Secreatary,O.H.D.S.
5	Location of project	At-Patrapada,Po-Haripur,G.P.- Nuagarh,Tangi
6	Total project cost	37,40,000/-
7	Amount released by DAC	18,70,000
8	Expenditure incurred	18,70,000
9	Status	Funtional
10	Capacity of the Unit	4000m <sup>2</sup>
11	Commodity	Gerbera,Rose
12	Condition of infrastructure	Polygreen house,A.I./G.I. Pipe
13	Whether N.H.M Logo Displayed	Yes
14	Whether Funds Disbursed	Yes

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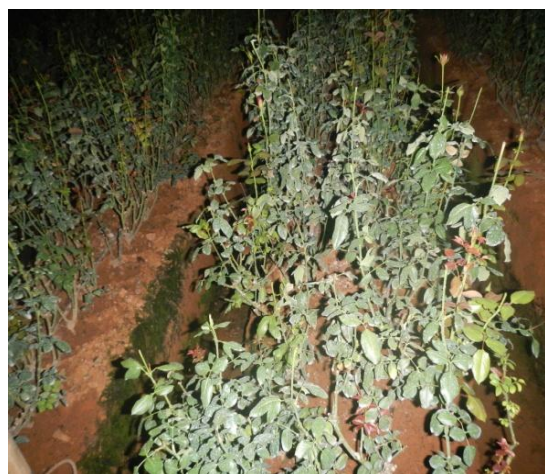
**Khurdha district photos:**



Polly house



Gerbera cultivation in polyhouse

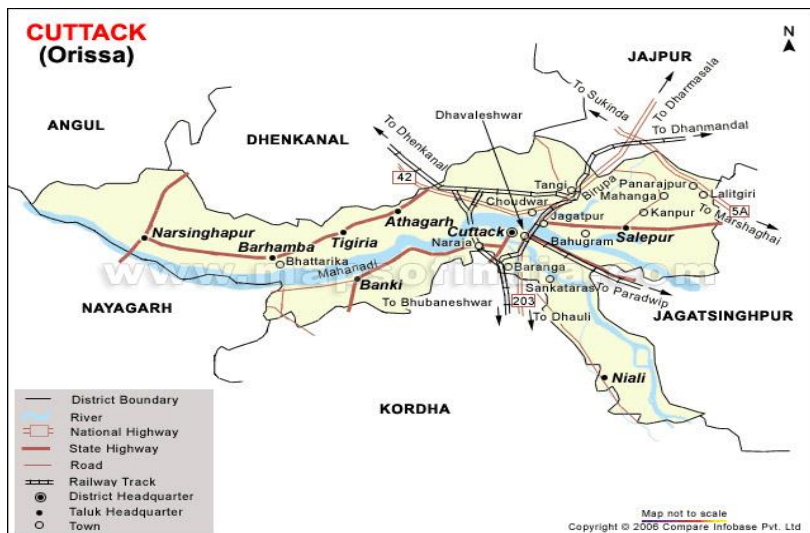






## Cuttack District :

Cuttack, the former capital of Orissa is situated in latitude 20.29' North and longitude 85.50' East and a distance of 29 K.m. from Bhubaneswar, the State capital of Orissa. The city of Cuttack stands at the apex of the delta of the Mahanadi, the great river of Orissa. The city extends from Mahanadi on the north to the Kathajodi on the south and covers an area of about 59.57 Kms and The total population of this district as per 2011 census is 26.18 lakhs. District Cuttack covers an area of 3932 sq.kilometer. Cuttack district is divided into three Sub-divisions namely: Cuttack, Athagarh and Banki. It has 15 Tehsils, 14 Blocks, 342 Gram Panchayat & 1966 villages.



### Geographical area and land use Features (Area in ha)

1	Geographical area	346472 ha
2	Forest Land	84341 ha
3	Land not available for cultivation (a) Non- Agriculture (b) Barren	52729 ha 9690 ha.
		<b>493232 ha.</b>
4	Cultivable waste Land	9824 ha
5	Permanent Pasture	10375 ha
6	Trees and Groves	11116 ha
7	Fallow Land	3295 ha
8	Others	-
9	Area sown( Net)	185055 ha
10	Area sown (More than once)	113222 ha
11	Net area irrigated	Kharif-1,13,600 ha <u>Rabi- 63,160 ha</u>
	<b>Total</b>	<b>113222 ha</b>

### Climate and soil:

District Experiences moderate warm humid climate and average annual rainfall is 1424.3 mm . Highest temperature 37°C and minimum occasionally comes below 10°C. temperature in the mid of day goes up to 41 to 42°C during May in recent years, under the influence of Loo from North India, Soil is loamy silting occurs due to flood inundation and river bank soil is alluvial . Some part of Tangi Choudwar block and Athagarh soil is yellow, laterite-red.

### Horticulture Development

For Horticulture, farmers give priority on good quality grafts/ seedlings, Vegetable seeds etc. Realizing it and under the influence of National Horticulture Mission Programme, some farmers have come forward to establish private nurseries in last years. Under the privilege of NHM programme in the district since 2005-06, farmers have established 11686 ha fruit, vegetable, spices, flower, tuber etc. and benefit of perennial fruit crops will be realized after a few years when plants will come to fruiting stage. Of late, farmers of this district have taken –up commercial floriculture. In one potential block, Nischintakoili, floriculture cluster has been created informally. In

Banki Sub-division, river side area is highly flood prone and in most of the area flood havoc is common. But, its soil is alluvial and highly silted. Vegetable is grown abundantly in the area although most of the years flood is a problem. Vegetable crop damage is common. But farmers are growing vegetable in patches without fear of flood . This sub-division has created vegetable local markets and also exporting to near by cities.

In spices, farmers were not much aware of getting benefits from spices like ginger, turmeric, onion , garlic except chilli. But after updating technical know how farmers are now being tempted for Ginger & Turmeric cultivation. Some of the watersheds are promoting cultivation of Ginger.As regards, cultivation of tuber crops farmers were traditionally cultivating sweet potato, Yam , colocasia etc, in river bank side and cultivable highlands. Under the privilege of NHM and ATMA, Cuttack, farmers are being prompted to cultivate promising varieties of yam in the district.

#### **AREA AND PRODUCTION OF HORTICULTURE CROPS**

**2007-08**

**2009-10**

Sl. No	Name of Crop	Area in ha.	Production (Ton)	Area in ha.	Production (Ton)
1	Vegetable	26031	345080	26031.00	237287.02 (Ton) 12089.96 (ton) (2 <sup>nd</sup> crop.)
2	Fruit	4223	28060	5260.3	44971.39 (Ton) 5422.28 (Ton) ( 2 <sup>nd</sup> crop)
3	Plantation	4594	120 (250 lakh nut ( coconut)	4594.00	44040.52 (Ton) 127.15 Lakhnut (Coconut)
4	Spices	5622	13060	5622.00	53858.76 (Ton)
5	Flowers				38.99 (Ton)

### Nurseries and their Capacities

SL. No	Sector	No of Nurseries	Seedlings/Grafts available
1	Departmental Nurseries	3 nos	Seedling -10,000 nos Graft-5000 nos.
2	Private Nurseries	14 nos	Seedling -10 lakh nos. Graft-8 lakh nos.

### AVAILABLE INFRASTRUCTURE FACILITIES MARKETS

Sl. No	Block	APMCS	
		Main market	Sub market
1	Cuttack sadar	Chhatrabazar, Cuttack	Bentakar
2	Tangi choudwar	Choudwar	Tangi, Bhagatpur
3	Salipur	Salipur	Paga, Rameswar, Sourihat
4	Barang	Trisulia	
5	Kantapada	Adaspur	
6	Niali	Niali	
8	Nischintakoili	Nischinta koili	Nemala, Tarat
8	Mahanga	Mahanga	Bilahat
9	Athagarh	Athagarh	
10	Baramba	Baramba	
11	Tigiria	Tigiria	Nuapatana, Balijhari
12	Narsighapur	Narasighapur	
13	Banki-1	Banki NAC	Tulasipur, Berhampura, Kalapathar
14	Banki-II	Jatamundia	



### Important Cold Storage in Cuttack district

SL NO	Name of Cold storage, adverse	Private/ Co-operative	Establishme nt	Capacity	Product stored
1	Cold storage, Jagatpur	Co-operative	1985	4000 M.T	Potato
2	Cold storage, Jobra	Cooperate	1978	7000 M.T	do
3	Cold storage-42 mauza	Private		}Not functioning	
4	Cold storage, Bahugam	Private		}Not functioning	

#### Observations:

- Conducting field visits and group discussion through field Technicians and block level junior field staff.
- Creating awareness in the public by making Publicity through print /electronic media centrally through Directorate and also by displaying boards/charts/photos regarding NHM programme in different Melas / Exhibitions.Distributing Leaflet/Chart etc.
- Creating awareness through plantation trainings/ exposure visits of farmers and at different training programmes conducted by ATMA / NGOs/ Exhibitions / Radio/ Television talks etc.In spite of making awareness though different media, some farmers complain that they are unaware of such programmes.
- Entrepreneurial development in horticulture is a bit cumbersome Banks are thinking many times before sanctioning a loan.

#### Progress of NHM Components:

This district is quite conducive to bring an average Horticultural growth Before NHM came into existence, there was, traditional fruit, vegetable and spices potential pockets in the district. Now-a-days, Location specific area development has been done through NHM programme. Although, there has been no significant overall growth with respect to area and productivity in Horticulture, floriculture clusters, area cluster in Cashew nut development has been created informally.

#### (a) Year wise Financial and physical progress

SI NO	Year	Physical(ha)		Financial(Rs)	
		Target(ha)	Achievet(ha)	Target(Rs)	Achievement
1	2005-06	2398.5 ha	2220.92 ha	66,06025/-	43,67,842
2	2006-07	4266.95 ha	3826.65 ha	91,21,622/-	87,35,626/-
3	2007-08	2763.74 ha	1834.52 ha	98,69,357/-	69,41,111/-

4	2008-09	1679.5 ha	1748.88 ha	1,01,55,482/-	85,48,204/-
5	2009-10	2293.86 ha	2055.4 ha	1,12,61,137/- (Funds received)	1,20,40,531/-
6	2010-11	1512.20ha	1505.80 ha	95,12,600/-	91,00,980/-
	2011-12	1610.80 ha	1610.80 ha	1,15,280/-	1,15,280/-
<b>GRAND TOTAL</b>		<b>16525.55 ha.</b>	<b>14802.97 ha</b>	<b>5,66,41,503/-</b>	<b>4,98,49,574/-</b>

### SALIENT ACHIEVEMENTS UNDER NHM 2005-06 to 2011-12

#### (b) Area expansion (Area in ha.):

Component	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	G.Total
<b>Perennial crops</b>								
Mango	0	100.4 ha	84.5 ha	300 ha	350 ha	350 ha	350 ha	1534.9 ha
Cashew	195.42 ha	404.55 ha	124.47 ha	157.3 ha	176 ha	200 ha	165 ha	1422.74 ha
Kagzilime	0	0	0	14 ha	40 ha	0	20 ha	74.0 ha
<b>Non-Perennial crops</b>						0	0	
Banana	44.7 ha	94.7 ha	29.1 ha	84.98 ha	47.4 ha	40 ha	70.8 ha	410.88 ha
Ginger	0	49.9 ha	0	0	0	0	0	49.9 ha
Turmeric	0	14.5 ha	0	0	0	0	0	14.5 ha
Yam	0	0	11.25 ha	0	4 ha	0	0	15.25 ha
Vegetable	1928.5 ha	3055.5 ha	1457.0 ha	840.1 ha	1262 ha	1120 ha	1230 ha	10893.1 ha
Flower crops	52.3 ha	107.1 ha	128.2 ha	352 .5 ha	176 ha	170 ha	216 ha	1202.1 ha
<b>Total</b>	<b>2220.92 ha</b>	<b>3826.65 ha</b>	<b>1834.52 ha</b>	<b>1748.88 ha</b>	<b>2055.4 ha</b>	<b>1880 ha</b>	<b>2051.8 ha</b>	<b>15618.17 ha</b>

**PROJECT MODE PROGRAMME ( Rs. in Lakh)**

Sl No.	Component	Unit	Amout ( Rs.lakh)
2005-06			
1	Poly green house	7 nos	
2006-07			
1	Estt of model nursery in public sector	1no	18 lakh
2	Estt of model nursery in private sector	1 no	18 lakh
3	Estt of Small nursery in private sector	1 no	1.5 lakh
4	Construction of green house	7nos	0.22 lakh
5	Drip irrigation	70 ha	
6	Sprinkler irrigation	120 ha	11.26 lakh
7	Drip demonstration	10 ha	
2007-08			
1	Plastic Tunnel	45 nos	0.1 lakh
2008-09			
1	Construction of green house	30 nos	1.78 lakh
2	Construction of shade net house	10 nos	0.1 lakh
3	Construction plastic tunnel	45 nos.	0.1 lakh
2009-10			
1	Drip Irrigation	24.793 ha	9.19 lakh
2	Sprinkler Irrigation	39.0 ha	
2010-11			
1	Drip Irrigation	33.80 ha	31.133 lakh
2	Sprinkler Irrigation	113.00	
2011-12			
1	Drip Irrigation	31.91 ha	17.65 lakh
2	Sprinkler Irrigation	79.0 ha	

**Impact of NHM** – In the last five years, National Horticulture Mission Programme has helped to increase area and productivity of fruit, flowers, Vegetable ,Cashew ,spices and tuber crops .

**Field visit (Performa enclosed)**

1. Murali DharPradhan, Dhaipur, Athagarh, Mango, 0.4ha.
2. Parsuram Nayak Rajadarshanpur, Athagarh, Mango, 4ha.
3. Satyananda Beura; Nuabandha, Athagarh, cashew, 1.6.
4. Ajaya Kumar Deo, Rajaballvapur, Athagarh, Mango, 1.00 ha
5. Pabitra Sahoo, Block Tigiria, cashew, 0.4ha
6. Ashok Majhi, Block-Tigiria, cashew, 1.00 ha.
7. Gourahari Pradhan, Block Tigiria,Mango, 0.60 ha.
8. Girish Kumar Swajin Block Tigiria, Mango. 0.4 ha.
9. Niranjan Rout Block-Tigiria, Mango, 1 ha.
10. Sanjiv Pattnaik, Block Tigiria, Mango, 0.8ha.
11. Sribacha Ku. Jena, Nuapatna Block-Tigiria, Mango, 1 ha.
12. Sribacha Ku. Jena Nuapatna Block-Tigiria, cashew, 0.4 ha.
13. Sulochana Das, Nuapatna Block Tigiria, cashew, 1.3 ha.
14. Binaya Kumar Sahoo Nuapatna, Block-Tigria, Mango, 0.1ha.
15. Prafulla Kumar Rout, Gokanakh Block-Tigiria,Mango, 0.1ha.
16. Maheswar Dehury, At/Po/GP-Kankadajodi, Block-Baramba, Mango, 1.60 ha.
17. Rabindra Kumar Mohapatra GP-Baramba, Block-Baramba, Mango, 1ha.
18. Srinibash Panda, Damangadia GP Beliapal, Block-Baramba, cashew, 4 ha.
19. Rabindra Kumar Mohapatra GP-Baramba, Block-Barmaba, Mango, 1 ha.

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Murali DharPradhan, Dhaipur, Athagarh
2	Total Land available with the beneficiary (Ha.)	0.4 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango (Amarapali)
5	Source of planting material	Departmental Farm
6	Number of plants planted	40 (0.4 ha)
7	Date of planting	2011-12

8	Number of plants which survived      Also indicate percentage survival	92%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	6600/-
10	Amount paid & date of payment	3960/-
11	Mode of payment	By cheque
12	Source of irrigation water	-
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	-
20	General upkeep of the plot Very good/good/Average/poor	-
21	Any other relevant observations by the J.I.T	-
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Parsuram Nayak Rajadarshanpur, Athagarh
2	Total Land available with the beneficiary (Ha.)	0.6
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango (Amarapali)
5	Source of planting material	Deaprtmental Farm
6	Number of plants planted	60 (0.6 ha)
7	Date of planting	2011-12
8	Number of plants which survived      Also indicate percentage survival	56(93%)

9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	9900/-
10	Amount paid & date of payment	5940/-
11	Mode of payment	By Cheque
12	Source of irrigation water	Douge Well
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Satyananda Beura; Nuabandha, Athagarh
2	Total Land available with the beneficiary (Ha.)	1.6 ha
3	Crop cluster under which covered	Cashew
4	Name & Variety of crop planted	Cashew(v4)
5	Source of planting material	Govt. Farm
6	Number of plants planted	320(1.6 ha)
7	Date of planting	2011-12
8	Number of plants which survived Also indicate percentage survival	94%

9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	32000/-
10	Amount paid & date of payment	19200/-
11	Mode of payment	By Cheque
12	Source of irrigation water	-
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Pravakar Sahoo, Somnath Pur, Athagarh
2	Total Land available with the beneficiary (Ha.)	0.8 ha
3	Crop cluster under which covered	Cashew
4	Name & Variety of crop planted	Cashew)v4)
5	Source of planting material	Cashew Corporation, Dhenkana
6	Number of plants planted	160(0.8 ha)
7	Date of planting	2011-12
8	Number of plants which survived Also indicate percentage survival	158 (98%)



9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	16000/-
10	Amount paid & date of payment	9600/-
11	Mode of payment	By Cheque
12	Source of irrigation water	Tank
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	Nil
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Ajaya Kumar Deo, Rajaballvapur, Athagarh
2	Total Land available with the beneficiary (Ha.)	1.00 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Small Nursery
5	Source of planting material	Govt. Farm
6	Number of plants planted	100 Mango
7	Date of planting	2010-11
8	Number of plants which survived Also indicate percentage survival	98%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	150000/-

10	Amount paid & date of payment	123500/- (Land develop, Barbed ware, watching shad, VC)
11	Mode of payment	By Cheque
12	Source of irrigation water	Bore Well
13	Whether Drip, Sprinkler system in use	Yes
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	Vermicompost
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Pabitra Sahoo, Block Tigiria
2	Total Land available with the beneficiary (Ha.)	0.4 ha
3	Crop cluster under which covered	Cashew
4	Name & Variety of crop planted	Cashew(v4)
5	Source of planting material	Deptt. Farm
6	Number of plants planted	0.80/0.04 he
7	Date of planting	2011-12
8	Number of plants which survived Also indicate percentage survival	95%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	3640/-, 1600+1600/-
10	Amount paid & date of payment	3640/-

11	Mode of payment	By Cheque
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16-	If so area covered	-
17-	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Ashok Majhi, Block-Tigiria
2	Total Land available with the beneficiary (Ha.)	1 ha
3	Crop cluster under which covered	Cashew
4	Name & Variety of crop planted	Cashew(v4)
5	Source of planting material	Deptt. Farm
6	Number of plants planted	200 (1 ha)
7	Date of planting	2009-10
8	Number of plants which survived Also indicate percentage survival	96%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	9100+4000+4000=17,100
10	Amount paid & date of payment	17,100

11	Mode of payment	By cheque
12	Source of irrigation water	-
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Gourahari Pradhan, Block Tigiria
2	Total Land available with the beneficiary (Ha.)	0.60 Ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango(Amarapali)
5	Source of planting material	Govt. Farm
6	Number of plants planted	60 (10.60 ha)
7	Date of planting	2012-13
8	Number of plants which survived Also indicate percentage survival	
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	4530+1980+1980
10	Amount paid & date of payment	Nil

11	Mode of payment	
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Girish Kumar Swajin Block Tigriria
2	Total Land available with the beneficiary (Ha.)	0.4 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango
5	Source of planting material	Govt. Farm
6	Number of plants planted	40 (0.4 ha)
7	Date of planting	2010-11
8	Number of plants which survived Also indicate percentage survival	96%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	3020+1320+1320
10	Amount paid & date of payment	3020+1320=4340/-
11	Mode of payment	By Cheque
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No

14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation**  
**Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Niranjan Rout Block-Tigiria
2	Total Land available with the beneficiary (Ha.)	1 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Govt. Farm
5	Source of planting material	100 (1 ha)
6	Number of plants planted	2009-10
7	Date of planting	96%
8	Number of plants which survived Also indicate percentage survival	7550+3300+3300
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	7550+3300+3300=14,150/-
10	Amount paid & date of payment	By Cheque
11	Mode of payment	-
12	Source of irrigation water	No
13	Whether Drip, Sprinkler system in use	Nil
14	Other inputs provided	No
15	Whether assistance availed for organic farming	-
16	If so area covered	-

17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Sanjiv Pattnaik, Block Tigiria
2	Total Land available with the beneficiary (Ha.)	0.8 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango
5	Source of planting material	Govt. Farm
6	Number of plants planted	80 (0.8 ha)
7	Date of planting	2011-12
8	Number of plants which survived Also indicate percentage survival	95%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	6040+2640+2640
10	Amount paid & date of payment	6040/-
11	Mode of payment	By Cheque
12	Source of irrigation water	Well
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	



20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Sribacha Ku. Jena, Nuapatna Block-Tigiria
2	Total Land available with the beneficiary (Ha.)	1 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango
5	Source of planting material	Govt. Farm
6	Number of plants planted	100 (1 ha)
7	Date of planting	2010-11
8	Number of plants which survived Also indicate percentage survival	96%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	7550+3300+3300
10	Amount paid & date of payment	7850+3300=11,150/-
11	Mode of payment	By Cheque & Online
12	Source of irrigation water	Well
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	

22	Whether NHM logo displayed	Yes
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**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Sribacha Ku. Jena Nuapatna Block-Tigiria
2	Total Land available with the beneficiary (Ha.)	0.4 ha
3	Crop cluster under which covered	Cashew
4	Name & Variety of crop planted	Cashew(v4)
5	Source of planting material	Govt. Farm
6	Number of plants planted	80(0.4 ha)
7	Date of planting	2010-11
8	Number of plants which survived Also indicate percentage survival	96%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	3316+1600=4916/-
10	Amount paid & date of payment	4916/-
11	Mode of payment	By Cheque
12	Source of irrigation water	Well
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Sulochana Das, Nuapatna Block Tigiria
2	Total Land available with the beneficiary (Ha.)	1.4 ha
3	Crop cluster under which covered	Cashew
4	Name & Variety of crop planted	Cashew (v4)
5	Source of planting material	Govt. Farm
6	Number of plants planted	280 (1.4 ha)
7	Date of planting	2010-11
8	Number of plants which survived Also indicate percentage survival	96%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	11606+5600
10	Amount paid & date of payment	17,206/-
11	Mode of payment	By Cheque
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack, Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Binaya Kumar Sahoo Nuapatna, Block-Tigria
2	Total Land available with the beneficiary (Ha.)	0.4 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango
5	Source of planting material	Govt. Farm
6	Number of plants planted	40 (0.4 ha)
7	Date of planting	2012-13
8	Number of plants which survived Also indicate percentage survival	96%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	3020+1320+1320
10	Amount paid & date of payment	Nil
11	Mode of payment	Nil
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack, Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Prafulla Kumar Rout, Gokanakh Block-Tigiria
2	Total Land available with the beneficiary (Ha.)	0.4 ha
3	Crop cluster under which covered	Mango
4	Name & Variety of crop planted	Mango
5	Source of planting material	Govt. Farm
6	Number of plants planted	40(0.4 ha)
7	Date of planting	2012-13
8	Number of plants which survived Also indicate percentage survival	96%
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	3020+1320+1320
10	Amount paid & date of payment	Nil
11	Mode of payment	Nil
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	No
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack, Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	Yes

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Maheswar Dehury, At/Po/GP- Kankadajodi, Block-Baramba
2	Total Land available with the beneficiary (Ha.)	1.60 ha.
3	Crop cluster under which covered	
4	Name & Variety of crop planted	Mango
5	Source of planting material	Supplied by the Hort. Deptt.
6	Number of plants planted	160 nos.
7	Date of planting	August-2010
8	Number of plants which survived Also indicate percentage survival	150
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	26400/-
10	Amount paid & date of payment	15840+5280=21120/-
11	Mode of payment	By A/c Pay Cheque
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack, Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Rabindra Kumar Mohapatra GP- Baramba, Block-Baramba
2	Total Land available with the beneficiary (Ha.)	1.00 ha
3	Crop cluster under which covered	
4	Name & Variety of crop planted	Mango
5	Source of planting material	Supplied by the Hort. Deppt.
6	Number of plants planted	100nos.
7	Date of planting	August-2010
8	Number of plants which survived Also indicate percentage survival	100
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	16500/-
10	Amount paid & date of payment	9900+3300=13200/-
11	Mode of payment	By A/c Pay Cheque
12	Source of irrigation water	Bore Well
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack, Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Srinibash Panda, Damangadia GP Beliapal, Block-Baramba
2	Total Land available with the beneficiary (Ha.)	4.00 ha
3	Crop cluster under which covered	
4	Name & Variety of crop planted	Cashew
5	Source of planting material	Supplied by the Hort. Deppt.
6	Number of plants planted	800nos.
7	Date of planting	August-2011
8	Number of plants which survived Also indicate percentage survival	800
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	
10	Amount paid & date of payment	
11	Mode of payment	By A/c Pay Cheque
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & Cuttack, Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	



**Check list for Reviewing Progress on Area Expansion and Rejuvenation  
Activities under National Horticulture Mission(NHM) by joint inspection**

1	Name & Address of beneficiary whose field visited	Rabindra Kumar Mohapatra GP- Baramba, Block-Barmaba
2	Total Land available with the beneficiary (Ha.)	1.00 ha
3	Crop cluster under which covered	Small Nursery
4	Name & Variety of crop planted	Mango
5	Source of planting material	Supplied by the Hort. Deptt.
6	Number of plants planted	320 nos.
7	Date of planting	August-2012
8	Number of plants which survived Also indicate percentage survival	320
9	Total amount of subsidy assistance due to the Beneficiary as (Rs.)	312500/-
10	Amount paid & date of payment	207210/- (Ch.No.606621/20.3.12) & Ch. No.605981/30.03.2011)
11	Mode of payment	By A/c Pay Cheque
12	Source of irrigation water	
13	Whether Drip, Sprinkler system in use	No
14	Other inputs provided	Nil
15	Whether assistance availed for organic farming	
16	If so area covered	
17	Assistance availed	
18	Available marketing facility for use crop	Local Market & cuttack, Bhubaneswar
19	Other infrastructure available in the variety	
20	General upkeep of the plot Very good/good/Average/poor	
21	Any other relevant observations by the J.I.T	
22	Whether NHM logo displayed	

## Cuttack district photo







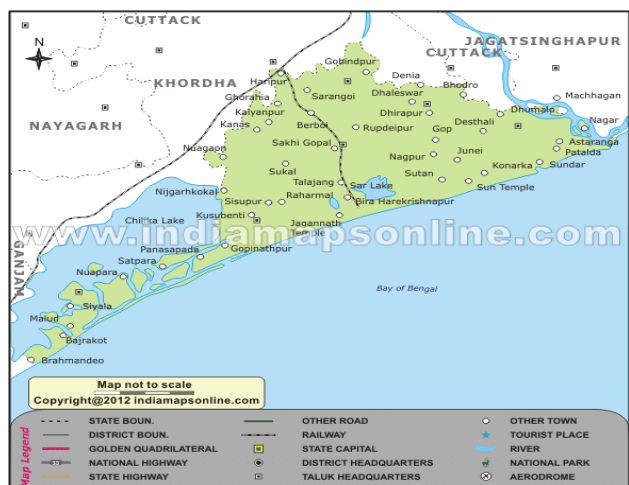
## Puri District:

The Puri district lies between the latitudes 19°28'N to 26°35'N and longitudes 84°29'E to 86°25'E. Puri is a district of Orissa and is one of the most popular and famous tourist spots of India. Covering a total geographical area of 3051 Square Kilometers, the district of Puri has a population of 1,697,983 according to the 2011 census. For the convenience of administration the district of Puri has been divided into several blocks, tahsils and municipalities. The district of Puri has been divided into 11 blocks, which includes:

Pipili, Krushna Prasad, Kakatpur, Nimapara, Puri,  
,Sadar,Satyabadi,Brahmagiri,Gop,Astarang, Kanas, Delang.

Lying on the coast line of the state of Orissa, the topography of the district of Puri is primarily affected by the Sea. The geography of the district of Puri can be divided into two completely different natural divisions, the littoral tract and the level alluvial tract. The sea coast of the district of Puri runs for about a unhindered stretch of 150.4 kilometers. A number of sandy ridges are found on the beaches of Puri and it is one such ridge that is responsible for the creation of the Chilika Lake. Most of the rivers that flow through the district of Puri are the tributaries of the Mahanadi river. These tributaries dry up in the summer months and are full during the monsoon months. The main rivers of the Puri district are:

- Bhargabi
- Kadua
- Daya
- Kushabhadra
- Prachi



## Climate and Soil:

The city of Puri has tropical climate where the maximum temperature reaches only 36°C and the minimum 15°C. Being nestled around the Bay of Bengal the coastal city has this kind of climate.

<b>Summer:Temperature:</b>	36°C	max	and	27°C	min.
<b>Winter Temperature:</b>	25°C	max	and	15°C	min.
<b>Average Rainfall:</b>				135.23	cm

**Summers**

Lying South of the Tropic of Cancer, the city enjoys tropical climate. The summer months last from March to June in Puri. The climate in summers becomes somewhat unbearable especially for the people visiting from cold regions as the mercury rises to 36°C and the days are invariably hot and hot winds blow. The summer temperature dips to a minimum of 27°C - 28°C only. If there is sudden rainfall then the humidity in the city rises due to the presence of the sea.

### Monsoons

The monsoon months of June to September receive a good and continuous amount of Rainfall in Puri. With the onset of Monsoon the city sometimes experiences heavy spells of rain due to its proximity to the Bay of Bengal. The climate becomes extremely humid during monsoons. If visiting the city during this season one would be continuously sweating due to the rise in humidity levels. The sea also becomes turbulent during monsoons and many a times the beaches are closed down or people are advised to not to go there. The month of July receives the heaviest rainfall and the local water bodies even get flooded during this time.

### Winter

The period between October to February is an ideal time to visit Puri and enjoy the pleasant weather. The winter season is not severe in this holy city. One probably needs to put on some light wool clothes at night but otherwise it is a pleasure to be here in Puri during this time of the year. The temperature does not dip down below 15°C here. The tourists mostly plan a visit to Puri in the Christmas holidays to enjoy their stay to the fullest at this beach city.

The whole of the district may be divided into two dissimilar natural divisions i) The littoral tract ii) The level alluvial tract

**i) The littoral Tract** The strip of the country lies between the alluvial and the Bay of Bengal. It assumes the form of a bear but sandy ridger which stretches along the sea-shore for the full length of the District, Varying from 6.5 km. to a few hundred metres in with . Accumulations of wind blown sand give rise to ridges parallel to the coast. It forms the dividing line between the Chilika lake and the ocean

## ii) The Level Alluvial tract

This level of alluvial region is full of villages and rice fields, watered by a network of channels, through which the water of distributaries of the most southerly branch of Mahanadi, find their way to the sea. There is no hill in Puri District except a small cultivate land are under plough. Generally biali or autumn rice, sarada or winter rice and dalua or spring rice these three types of rice are cultivated.

### ]Sea-coast Bays:

The length of the sea-coast of the district of Puri is nearly 150.4 km. Sandy ridges are found along the sea-coast which stretch into the districts of Jagatsingpur and Ganjam . One such sandy spit divides the lake Chilika from Bay of Bengal . These sandy ridges and dunes are formed by the strong monsoon currents which blow over the country for nearly 8 months of the year . The ridges vary from about 7 km to a few metres in width and have prevented most of the rivers of the district from finding their way into the ocean.

### Island :

No Island is found in the coastal waters of Puri, but the Chilika lake is separated from the Bay of Bengal by a group of Islands.

### River system:

All the rivers of Puri district have a common characteristic. In the hot weather they are beds of sand with tiny streams or none at all, while in the rains they receive more water than they can carry. Generally all rivers are distributaries of Mahanadi rivers.

**1) Kushabhadra River-** A branch of *Kuakhai* river originates from Baliana and meets the sea of **Bay of Bengal** at the shrine of Ramachandi, located 15 miles east of Puri. Its tributary *Mugei* joins with *Kushabhadra*.

**2) Daya River-** A branch of *Kuakhai* river drains into the **Chilika** lake. Two small rivers join with Daya river i.e. the *Gangua* and the *Managuni* below Kanas. Daya river has been attributed with problem of causing silt build-up in **Chilika Lake**.

**3) Bhargavi River-** A branch of *Kuakhai* meets the sea of **Bay of Bengal** after breaking up into numerous distributaries in the last two and half miles of its course. There are four main branches all branching off from the left bank viz. *Kanchi*, the *East Kania*, the *Naya Nadi* and the *South Kanchi* (which drains into Sar Lake); and by various channel the first three are interconnected and finally join the *Suna Munhi* river which falls into **Bali Harchandi** and ultimately drains to the Bay of Bengal sea via the mouth of Chilika. The *South Kania* gets lost in the marshes on the western shore of Chilika.

**4) Kadua River-** It is a monsoon fed river that drains into *Prachi* river.

**5) Prachi River-** It is a branch commencing from Puri and Jagatsinghpur district. It has its origin near Kantapara on Cuttack-Gop road and passes through the village of Kakatpur before draining into the sea of Bay of Bengal.

**6) Devi River-** It is a branch of *Kathajori*. It runs into Puri district near the extreme east forming numerous branches.

There are also a few small rivers worth a mention, chiefly *Ratnachira* and *Nuna*, which drain into *Bhargabi river* and *Daya river* respectively.

Map of lake Chilka with near-by settlement of Puri.

1. The Chilika Lake

2. The Sar Lake

### **Agriculture Porfile:**

1	No of P.A.C.S	213
2	Geographical Area in hecets	264988 Ha/ 3051 Sq. Km.
3	Cultivated Area in hecets	188745
a)	High land	45653
b)	Medium land	57654
c)	Low land	85438
13	Paddy Area in hecets	170658
a)	High land	27966
b)	Medium land	57254
c)	Low land	85438
14	Water logged Area in hecets	15192
15	Saline area in hecets	19480
16	Imigate Area in hecets	105106
17	Forest Area in hecets	18175
18	Misc trees groves in hecets	7524
19	permanent pasturcs in hecets	11328
20	Culturable waste in hecets	8226
21	Land pat to non-Agri use in hecets	17259
22	Baren & unculturable waste in hecets	8866
23	No. of High Schools	173
24	No. of Sanskrit Tol	10
25	No. of English Medium School	3
26	Total Population(2011 provisional)	1,697,983
(a)	Male	865,209
(b)	Female	832,774
31	No. of Police Stations	18

**Farmers Field Visit Performa enclosed):**

1. Santosh Behera Jasua Pur, Pipili Pipili, Puri, crop: Mango (Amrapalli)-1ha.
2. Santosh kumar padi Jasua Pur, Pipili Pipili, Puri., Mango (Amrapalli), 4.00ha.
3. Pratap Senapati Padaguna, Pipli Pipli, Puri, Mango (Amrapalli), 1ha.
4. Aparti Mohapatra, Village-Paripotali Block pipili, District-Puri, vegetable, 0.40 ha.
5. Tapan Jean/Sapna Jena Kashipur, Tanuja Jena. Sainsasan Nimapara, Puri, Banana, Bantal, 2.00 ha.
6. Bipin Ku, Barik Dalabyhanapur, Haripur, Nimapara, Puri, Banana (Bantal), 1ha.
7. Pranaya Ku. Moharathi Dalabhanapur, Haripur Nimapara, Puri, Banana (Patakapura) 1ha.
8. Kailash Ch. Swain Olikana, Sagada Nimapara, Puri, Banana (Bantal) mixed, 1.00 ha.
9. Diganta Ku. Dash Nimapara, Puri, Mango, mixed variety (Amarapali), 2.00 ha.
10. Saudamini Swain Andiasahi Nimapara, Puri, Mango (Amarpalli), 2.00 ha.
11. Sudarsan Sahoo Erabanga, Gop, Puri, Mango, Banana, 5.00 ha

**Check list for Reviewing Progress on Area Expansion and Reuvenation Activity under National Horticultutre Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Santosh Behera Jasua Pur, Pipili Pipili, Puri.
2	Total alnd available with the beneficiary (ha)	2.00 ha.
3	Crop cluster under which covered	1.00
4	Name and variety of crop planted	Mango (Amrapalli)
5	Source of planting material	Ekarmakanana, BBSR
6	Number of Plants planted	100 nos.
7	Date of Planting	July-2010
8	Number of Plants which survived (Also indicate percentage survial)	90 nos 90%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	16500
10	Amount paid and date of payment	7875
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well



13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	No
15	Weather assistance availed for organic farming	Vermi compost
16	If so area covered	-
17	Assistance availed	7500
18	Available marketing facility for the crop	Puri, BBSR
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/poor)	Good
21	Any other relevant observation by the J.I.T	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Santosh kumar padi Jasua Pur, Pipili Pipili, Puri.
2	Total land available with the beneficiary (ha)	4.00 ha
3	Crop cluster under which covered	2.50
4	Name and variety of crop planted	Mango (Amrapalli)
5	Source of planting material	Ekarmakanana, BBSR
6	Number of Plants planted	100 nos.
7	Date of Planting	July-2010
8	Number of Plants which survived (Also indicate percentage survival)	85 nos 85%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	16500

10	Amount paid and date of payment	7875
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well
13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	No
15	Weather assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for the crop	Puri BBSR
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/poor)	Good
21	Any other relevant observation by the J.I.T	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Pratap Senapati Padaguna, Pipli Pipli, Puri
2	Total land available with the beneficiary (ha)	1.00 ha
3	Crop cluster under which covered	0.4
4	Name and variety of crop planted	Mango (Amrapalli)
5	Source of planting material	Ekarmakanana, BBSR
6	Number of Plants planted	100 nos.
7	Date of Planting	July-2010
8	Number of Plants which survived	90 nos

	(Also indicate percentage survival)	90%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	16500
10	Amount paid and date of payment	7875
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well
13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	No
15	Weather assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for the crop	Puri, BBSR
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/poor)	
21	Any other relevant observation by the J.I.T	

#### **NMMI DRIP IRRIGATION**

1	Name of the beneficiary	Aparti Mohapatra
2	Address	Village-Paripotali Block pipili, District-Puri
3	Type of system installed	Drip irrigation system
4	Crop	Vegetable
5	Area	0.40ha.
6	Name of the company	Jain irrigation System Ltd
7	Estimated cost	Rs.58,367

8	Subsidy Amount	Rs.35,272
9	Date of completion	31.08.2012
10	Subsidy released	06.09.2012

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Tapan Jean/Sapna Jena Kashipur, Tanuja Jena. Sainsasan Nimapara, Puri
2	Total land available with the beneficiary (ha)	2.00 ha
3	Crop cluster under which covered	Banana cluster
4	Name and variety of crop planted	Banana, Bantal
5	Source of planting material	Local Source
6	Number of Plants planted	1875 nos.
7	Date of Planting	March-12
8	Number of Plants which survived (Also indicate percentage survival)	1700 90%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	6750 each
10	Amount paid and date of payment	25.75 each, 31.3.12
11	Mode of Payment	Account Payee
12	Source of Irrigation water	Deep bore well
13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	No
15	Weather assistance availed for organic farming	Yes
16	If so area covered	2.00

17	Assistance availed	7500
18	Available marketing facility for the crop	Local BBSR, Puri
19	Other infrastructure available in the vicinity	Organic manure unit under CDB
20	General upkeep of the plot (Very Good/ Good/Average/poor)	Good
21	Any other relevant observation by the J.I.T	

1.	Name and address of beneficiary whose field visited	Bipin Ku, Barik Dalabyhanapur, Haripur, Nimapara, Puri
2	Total alnd available with the beneficiary (ha)	1.00 ha.
3	Crop cluster under which covered	Banana
4	Name and variety of crop planted	Banana (Bantal)
5	Source of planting material	Local
6	Number of Plants planted	625
7	Date of Planting	March-12
8	Number of Plants which survived (Also indicate percentage survial)	600 96%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	6750
10	Amount paid and date of payment	2575
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well
13	Weather Drip, Sprinkler, system in use	No
14	Other inpurts provided	No
15	Wheather assistance avialed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for the crop	Local BBSR, Puri
19	Other infrastructure avialable in the vicinity	-
20	General upkeep of the plot (Very Good/ Good/Average/poor)	Average
21	Any other relevant observation by the J.I.T	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Pranaya Ku. Moharathi Dalabhanapur, Haripur Nimapara, Puri
2	Total land available with the beneficiary (ha)	3.00 ha
3	Crop cluster under which covered	1.00
4	Name and variety of crop planted	Banana (Patakapura)
5	Source of planting material	Own source/ Local collection
6	Number of Plants planted	2500 nos
7	Date of Planting	March-2012
8	Number of Plants which survived (Also indicate percentage survival)	2300nos. 92%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	16875 (1 <sup>st</sup> year)
10	Amount paid and date of payment	10,300/- 19.1.12
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well
13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	No
15	Weather assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for the crop	Local Market, BBSR, CTC
19	Other infrastructure available in the vicinity	Poultry, pisciculture
20	General upkeep of the plot	Good

	(Very Good/ Good/Average/poor)	
21	Any other relevant observation by the J.I.T	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Kailash Ch. Swain Olikana, Sagada Nimapara, Puri
2	Total land available with the beneficiary (ha)	1.00 ha
3	Crop cluster under which covered	0.4
4	Name and variety of crop planted	Banana (Bantal) mixed
5	Source of planting material	Local, NHM supply
6	Number of Plants planted	625 nos.
7	Date of Planting	March-2012
8	Number of Plants which survived (Also indicate percentage survival)	600 nos. 96%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	6750
10	Amount paid and date of payment	2575
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well
13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	NHM Vermi compost
15	Whether assistance availed for organic farming	Yes
16	If so area covered	8.6*6.6*3.3*(2 Acs,)



17	Assistance availed	7500
18	Available marketing facility for the crop	Local market, BBSR, Puri
19	Other infrastructure available in the vicinity	No
20	General upkeep of the plot (Very Good/ Good/Average/poor)	Good
21	Any other relevant observation by the J.I.T	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Diganta Ku. Dash Nimapara, Puri
2	Total land available with the beneficiary (ha)	2.00 ha
3	Crop cluster under which covered	1.00
4	Name and variety of crop planted	Mango, mixed variety (Amarapali)
5	Source of planting material	Ekamarkanan Nursery, BBSR
6	Number of Plants planted	100 nos.
7	Date of Planting	July-2009
8	Number of Plants which survived (Also indicate percentage survival)	70 nos. 70%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	16500 (three instalments)
10	Amount paid and date of payment	16500 (three instalments)
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well, Pond
13	Weather Drip, Sprinkler, system in use	No

14	Other inputs provided	No
15	Weather assistance availed for organic farming	Yes
16	If so area covered	Vermi Hatchery
17	Assistance availed	27,500
18	Available marketing facility for the crop	Local Market BBSR. Puri
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/poor)	Good
21	Any other relevant observation by the J.I.T	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Saudamini Swain Andiasahi Nimapara, Puri
2	Total land available with the beneficiary (ha)	2.00 ha
3	Crop cluster under which covered	0.4
4	Name and variety of crop planted	Mango (Amarpalli)
5	Source of planting material	Ekamarkana, BBSR
6	Number of Plants planted	40NOS.
7	Date of Planting	July-2011
8	Number of Plants which survived (Also indicate percentage survival)	35nos. 75%
9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	3690
10	Amount paid and date of payment	3100- 31.1.12

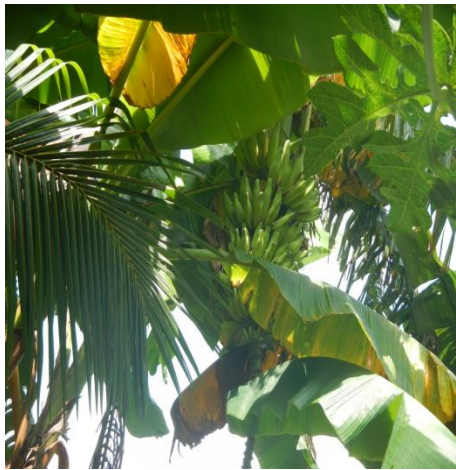
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well, pond
13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	No
15	Weather assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for the crop	BBSR, Puri
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/poor)	
21	Any other relevant observation by the J.I.T	

**Check list for Reviewing Progress on Area Expansion and Rejuvenation Activity under National Horticulture Mission (NHM) by Joint Inspection Team.**

1.	Name and address of beneficiary whose field visited	Sudarsan Sahoo Erabanga, Gop, Puri
2	Total land available with the beneficiary (ha)	5.00 ha
3	Crop cluster under which covered	0.8
4	Name and variety of crop planted	Mango, Banana
5	Source of planting material	Local, Ekamarkanana, BBSR
6	Number of Plants planted	2000 nos.
7	Date of Planting	March-2012
8	Number of Plants which survived (Also indicate percentage survival)	1800 nos. 90%

9	Total amount of subsidy assistance due to the beneficiary as (Rs.)	13500
10	Amount paid and date of payment	8240
11	Mode of Payment	Account payee
12	Source of Irrigation water	Bore well, pond
13	Weather Drip, Sprinkler, system in use	No
14	Other inputs provided	No
15	Weather assistance availed for organic farming	No
16	If so area covered	-
17	Assistance availed	-
18	Available marketing facility for the crop	Local, BBSR, Puri
19	Other infrastructure available in the vicinity	
20	General upkeep of the plot (Very Good/ Good/Average/poor)	
21	Any other relevant observation by the J.I.T	

## Puri District Photo







## **STATE: ODISHA**

### **Introduction**

**1.1** Horticulture consisting of fruits, vegetables, spices, floriculture, root & tuber crops, mushrooms, medicinal & aromatic plants as well as plantation crops has emerged as a core sector in agriculture due to its substantial increase both in area and production. Today horticulture has established its credibility in improving income through increased productivity, generating employment and in enhancing export besides providing household nutritional security. The growing economic importance of horticultural crops especially fruits; vegetables and flowers could be attributed to the increasing demand arising from domestic as well as overseas markets. The increasing domestic demand could be attributed to the increase in income, population growth, changing consumption pattern and growing awareness for better nutrition. At national level horticulture sector has emerged as a potential player in the Indian economy contributing 30% to GDP in agriculture from more than 8.5% area under horticultural crops as well as a means of diversification in overall development of agriculture. The earlier seasonal availability of fruits and vegetables has now extended to all the year round, increasing the per capita consumption of fruits and vegetables. The national goal of achieving 4% growth in agriculture can be achieved through the major contribution in growth from horticulture.

One important trend observed in the last five years is that horticulture development has gradually moved out of its rural areas to urban areas and from traditional agricultural enterprise to the corporate sector. This trend has led to the adoption of improved technology, greater commercialization and professionalism in the management of production and marketing of different horticulture crops. The National Horticulture Mission Schemes have helped in exploring the horticulture potential of the State since 2005-06 as it provides scope for taking up a variety of components in areas of development of planting material, production and productivity improvement programmes, PHM and marketing.

Odisha is the 10<sup>th</sup> largest state in area and 11<sup>th</sup> in population in the country, accounting for 5% of the geographical area and 4% of the population of the country.

The state has a geographical area of 1.56 lakh sq. km and population of 3.68 crores as per 2001 census. Administratively the state is divided into 30 districts, 58 subdivisions, 314 CD blocks, 171 tahasils, 35 municipalities and corporations, 6234 gram panchayat and 11349 villages. Out of the total population, Scheduled Caste and Scheduled Tribes constitute 17% and 22% of the total population respectively. 85% of the population lives in rural area. Cultivators and agricultural labourers constitute 65% of the total workforce. The total literacy percentage is 63.08. The state is located in the eastern region of the country and spreads 450 kms along the Bay of Bengal.

**1.2. Climate:** The climate of the state is tropical, characterized by high temperature, high humidity, medium to high rainfall and a mild winter. The normal rainfall is 1482.2 mm distributed over 72 rainy days. South West monsoon contributes about 81-83 % of the annual rainfall in 53-57 days during June-September. The mean annual temperature of the State is 26.89<sup>0</sup> C with mean annual maximum of 32.56<sup>0</sup> C and mean annual minimum of 21.30<sup>0</sup> C.

**1.3. Soil :** From the physio-graphic point of view, the State consists of four Zones, viz. (i) Northern Plateau (ii) Eastern Ghat zone (iii) Central Table lands, and (iv) Coastal plain zone. However, on the basis of climate, soil, rainfall, topography and crops suitability, the state has been divided into ten Agro- Climatic zones. The soil types differ widely from highly acidic to slightly alkaline and from light sandy to stiff clays. The soils are mainly acidic with the degree of acidity varying widely. Further, about 4 lakhs hectares are exposed to saline inundation, 3.54 lakh ha. to flooding and 0.75 lakh ha. to water logging particularly in the deltaic areas.

**1.4. Irrigation:** The total irrigation potential created so far from all sources is about 39.31 lakh ha. (Kharif 26.65 lakh ha. & Rabi 12.66 lakh ha.). The gross irrigated cropped area is 27 lakh ha. Which is about 68% of the potential created? The source wise irrigation potential created so far (up to 2004-05) is indicated below.

Sr. No.	Sources	Kharif	Rabi
1.	Major & Medium	12.38	5.63
2.	Minor (Flow)	4.98	0.71
3.	Minor (Lift)	3.64	2.19
4.	Other sources	5.65	4.13
<b>TOTAL</b>		<b>26.65</b>	<b>12.66</b>



**1.5. Potential for Horticulture:** The agro-climatic diversity in the State with its high rain fall distributed over a four-month monsoon and a reasonably moderate winter allows for growing a variety of horticultural crops. The agro-climatic conditions are immensely suitable for perennial fruit crops like mango, litchi, guava, oranges and limes; annual fruit crops like banana, pineapple and papaya ; spices like ginger, turmeric and chilly, a variety of roots and tubers and a whole range of vegetables. The low-temperature hilly areas at higher altitude offer ideal conditions for growing off-season vegetables. Of late floriculture is also showing excellent prospects. The State thus enjoys a natural comparative advantage for horticulture with possibilities for growing a diversified basket of fruits, vegetables, spices, tubers and flowers; whose potential has not been fully exploited.

**1.6. Land Availability:** The state has a total cultivable area of 61.65 lakh hectares. Out of this, 15.57 lakh hectares are low lands, 19.14 lakh hectares are medium lands and 26.94 lakh hectares are high lands. In Odisha generally Agricultural crops particularly Paddy are grown in the Low & Medium land area in a consolidated manner. So there is vast scope to convert the Up lands and waste lands of the state for Horticultural crops. It was envisaged during the preparatory phase of NHM to cover at least 7.0 lakh ha. lands, out of which we have achieved only 3.10 lakh ha. under NHM and other schemes during last 5 year. Hence, there is immense scope for crop diversion particularly to horticultural crops.

**1.7.Farming structure:** According to the agricultural census there were 40.66 lakh operational farm holdings occupying 50.81 lakh ha with an average land holding of 1.25 ha the marginal and small farmers constitute 85% of the farmers who have access about 50% of the operational area. Thus the remaining 50% is occupied by only 15% of landholders as depicted.

#### **FARM HOLDINGS- CATEGORY WISE**

<b>Category of farmers</b>	<b>Holding size (ha)</b>	<b>Nos (Lakh)</b>	<b>Area (Lakh ha)</b>
Marginal	< 1.0	22.95	11.55
Small	1.0-2.0	11.13	15.44
Semi-medium	2.0-4.0	5.00	13.44
Medium	4.0-10.0	1.45	8.18
Large	> 10.0	0.13	2.20
<b>Total</b>	<b>1.25</b>	<b>40.66</b>	<b>50.81</b>

## NATIONAL HORTICULTURE MISSION IN THE STATE

### The mission:

- National Horticulture Mission (NHM) is a flagship programme supported by Ministry of Agriculture, Government of India in Horticulture sector in the country. It was launched in 2005-06 (September, 2005).
- The Orissa state is implementing the mission activities over 24 districts listed as below:

Year	Districts Covered
2005-06	Bolangir, Balasore, Cuttack, Gajapati, Keonjhar, Khurda, Koraput, Kalahandi, Mayurbhanj, Malkangiri, Nawarangpur, Nuapada, Nayagarh, Puri, Rayagada, Sonepur
2006-07	Ganjam, Phulbani, Dhenkanal
2007-08	Bargarh, Deogarh, Sambalpur, Sudargarh, Angul

### • Impact of NHM:

- The State has not only become self sufficient in production of quality planting material of mango, cashew nut, ginger & turmeric etc. but also started exporting the quality planting material to the states of Chhatisgarh, West Bengal & Jharkhand.
- 142 nos. public sector nurseries have been upgraded with water supply, shadenet, farm equipments, irrigation facilities etc.
- Floriculture has come up in big way particularly gladiolous, marigold, tuberose & rose etc.
- Spices cultivation – ginger & turmeric has been popularized in Kandhamal & Koraput districts.

### Financial achievements – Year-wise (Fig. in lakh Rs.)

Year	Central share receipt	State share receipt	Total	Expenditure
2005-06	3611.91	Nil	3611.91	599.21
2006-07	4450.00	Nil	4450.00	1711.61
2007-08	3812.16	659.07	4471.23	3016.75
2008-09	2341.00	412.94	2753.94	5922.57
2009-10	3500.00	617.64	4117.64	6405.32

2010-11	3259.00	575.11	3834.11	5434.98
2011-12	5355.00	944.99	6299.99	5119.70
<b>Total</b>	<b>26329.07</b>	<b>3209.75</b>	<b>29538.82</b>	<b>28210.14</b>

- **Major cumulative achievements under NHM during 2005-06 to 2011-12**

Fruit Plantation	146537.43 ha.
Vegetable seed Production (Distribution of Vegetable minikit)	1125000 nos.
Spices	7468.13 ha.
Nursery	121 nos.
Floriculture	11292.59 ha.
Vermi compost	3416 nos.
Training & Visit of Farmers	22363 nos.
Onion Storage Structure	3795 nos.

#### **Area and production of Horticultural Crops**

<b>Name of the Crop</b>	<b>Before NHM (2006-07)</b>			<b>After NHM 2007-08 to 2011-12</b>		
	<b>Area (Ha.)</b>	<b>Production M.T.</b>	<b>Productivity</b>	<b>Area (Ha.)</b>	<b>Production M.T.</b>	<b>Productivity</b>
Mango	6750	28269	4.19	8900	48950	5.5
Cashew	4600	3450	0.75	6750	6410	0.95
Guava	240	2704	11.27	250	2800	11.2
Citrus	895	7782	8.7	950	8550	9
Litchi	6	18	3	10	27	2.7

Sapota	72	285	3.96	75	290	3.87
Banana	408	5141	12.6	410	5830	14.22
Coconut	1508	51 Lakh nuts	3382 nuts per Ha.	1700	71 Lakh nuts	4176 nuts per Ha.
Papaya	20	197	9.85	30	310	10.34
Pineapple	23	234	10.17	25	250	10
Others	1266	10881	8.6	1266	10881	8.6
<b>Total</b>	<b>15788</b>	<b>58961 &amp; 51 Lakh nuts.</b>	<b>4.12</b>	<b>20366</b>	<b>84928 &amp; 71 Lakh nuts.</b>	<b>4.5</b>

### Soils of Orissa

Orissa is a state with different physiographic and agro-climatic zones. Soils are generally fertile, but some deficient and problematic soils need proper management. Important crops like rice, pulses, oil seeds, sugarcane, coconut and turmeric are grown and one-tenth of the rice production of India is contributed by Orissa.

### Geographical Situation

The state of Orissa lies in the tropical belt in the eastern region of India 17°31' - 22° 27' north latitude and 81° 27'-87°30' east longitude. The state is surrounded by West Bengal in the north-east, Bihar in the north, Andhra Pradesh on the south-west, Madhya Pradesh on the north- west and on the east it is having a long coast line of 480 kilometers with the Bay of Bengal. It is the tenth largest state in India covering an area 15.57 m hectares.

## Land Utilization Pattern

The land use in Orissa state can be seen in Table 1.

Table 1: Land Utilization Pattern of Orissa

Sl.No	Land use	Area (mha)	Area (%)
1	Total geographical area	15.57	-
2	Reporting area per land utilization statistics	15.54	99.80
3	Forests	6.60	42.47
4	Not available for cultivation	0.90	5.79
5	Other uncultivated land excluding fallow land	1.30	8.36
6	Fallow land	0.64	4.12
7	Net area sown	6.13	39.44
8	Area sown more than once	2.61	-
	Total cropped area	8.74	

## Physiography

The state can be broadly divided into four physiographic zones based on the existing relief features. These are given as follows.

### 1. The northern plateau

It is a continuation of Chotanagpur plateau of Bihar and chiefly comprises of the districts of Mayurbhanj, Keonjhar, Sundergarh covering about 23 percent of the total area of the state. There are a number of hill ranges rising to elevation of 610 to 914 metres above the mean sea level. The topography is from undulating to gently rolling. On the east of the plateau lie the Semlupal ranges of Mayurbhanj district. The Gandhamardan and Meghasan hills of Keonjhar district serve as natural barrier to monsoon wind. The region constitutes the watersheds of river Baitarani, Salandi, and Budhabalanga. The hills are thickly wooded with sub-tropical forests.

## 2. Central table land

This part consists of generally flat with undulating and folded topography covering the Mahanadi river basin with its tributaries of Ib, Iira, Ong and Tel.

## 3. The eastern ghat

It consists of hill ranges covering 36 percent of the total area of the state. The region has the river Tel and its tributaries in the north and Vamsadhara and Nagabali in the south-east and Machkund in the South-west

## 4. The coastal region

It runs from north to south of the state in a strip ranging in width from 24 to 72 km bordering the sea coast. The coastal plain is characterised by a number of deltas mainly formed by the rivers Subarnarekha, Mahadi, Brahmani and Baitarani.

## Climate

The climate is characterized by high temperature and medium rainfall. Topography, however, modifies the local climate greatly. The average annual rainfall of the state is 1498 mm. Mean annual temperature for the state is 26.2°C. Mean summer temperature from April to June is 30.3°C and mean winter temperature from December to February is 21.3 degree centigrade.

The climate may be classified under hot moist subhumid and hot and dry sub-humid. The climate of Koraput district is, however, warm and humid.

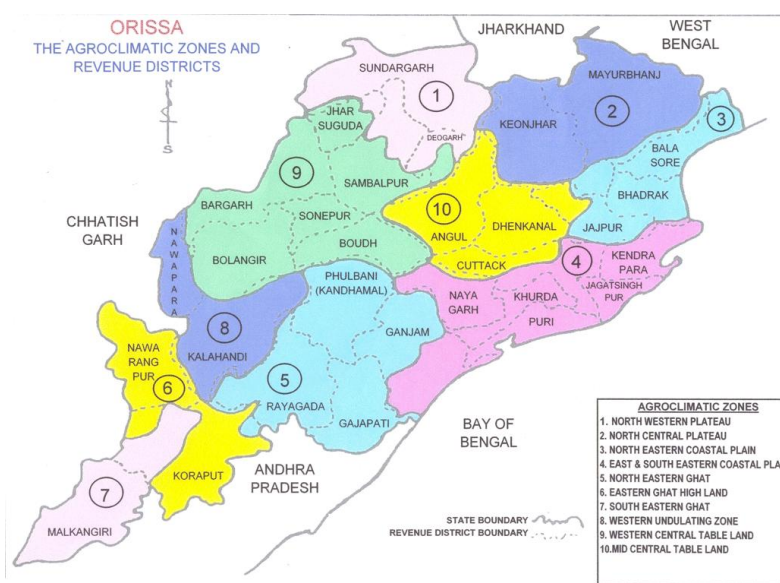
Integrating the effect of land from the topography, climate, soils and crop adoptability, the state is divided into 10 agroclimatic zones as shown in Table.2.

**Agro-climatic Zones of Orissa**

Sl.No	Zone	District	Broad soil group
1	North western plateau	Sundargarh	Mixed red & yellow
2	North central plateau	Keonjhar	Red
3	North eastern coastal plain	Balasore	Coastal alluvial
4	East & south eastern coastal plain	Puri & Cuttack	Deltaic alluvial & laterite
5	North eastern ghat	Phulbane	Red loam & brown forest

6	Eastern Ghat highland	Koraput	Red & laterite
7	South eastern Ghat	-do-	Red
8	Western undulating	Kalahandi	Red & black
9	West central table	Sambalpur Bolnagar	Mixed red & black
10	Mid central table land	Dhenkanal	Red & laterite

**For full detail please refer to the Map of agro-climatic zones of orissa)**



## Vegetation

The natural vegetation of the state belongs to northern tropical moist deciduous forests in the eastern ghat region and the northern tropical dry deciduous forests in the north-west-ern districts of Sambalpur, Sundergarh, Mayurbhanj and Keonjhar, Sal (*Shorea robusta*) is the principal flora. Besides sal, top canopy mixed forest trees of *Anogeissus latifolia*, *Terminalia tomentosa*, *Petrocarpus marsupium*, *Adina cordifolia*, *Lagerstroemia parviflora*, *Dillenia pentagyna*, *Bridelia retusa* etc.

The lower canopy consists of *Gardenia* sp, *Phyllanthus emblica*, *Flemingia chafferi*, *Indigofera pulchella*, *Phoenix acaulis*, *Milletia* sp etc. The forest canopy has been reduced to 25 percent of the total geographical area of the state due to deforestation.

## **Soils**

Soils of Orissa are mainly developed by the relief, parent material and climate. The biotic features, mainly the natural vegetation follows the climatic pattern. Soils of Orissa have been divided into 8 broad soil groups which are given in detail here.

### **Red soils**

The main features are coarse texture, single grained to weakly granular structured surface soil, highly porous with low available water holding capacity. These put severe limitations for rainfed farming. These soils are non saline and do not contain any lime kankar or free carbonate. The red colour is due to presence of iron oxides. These soils are moderately acidic and are generally deficient in nitrogen, organic matter and molybdenum. Boron deficiency symptoms have been observed in vegetable crops. The added phosphorus is generally fixed in these soils due to presence of free iron and aluminium oxides.

### **Laterite and lateritic soils**

These soils contain lateritic mass within control section of the profile. The lateritic mass is characterized by compact to vesicular sometimes honey-combed structure, composed essentially of a mixture of hydrated oxides of iron and aluminium with small amount of manganese and titanium oxides and quartz as a necessary diluent. These soils are highly permeable and are poor in nitrogen, phosphorus, potassium

and calcium. They are generally acidic in nature.

### **3. Red and yellow soils**

They occur as a catenary association in undulating and rolling terrains which differ in depth, texture, colour and cropping systems. Soils of uplands are comparatively coarser in texture having red and yellowish red colour, shallow in depth and are well drained. Ferruginous nodule are invariably met within these soils. Soils are comparatively more acidic than those of lower reaches. The soils of low lying areas, especially of bottom land situation are formed on colluvial, and alluvial deposits. These are of fine texture, deep and show pale yellow greyish and olive shade of colour. They occasionally show effect of mottling due to submergence in monsoon and drying thereafter.

The cropping systems followed in yellow soils is rice followed by pulses/oilseeds with residual soil moisture or supplementary irrigation and that followed in upland red soils is monocrop of pulses/oilseed/millet.



#### **4. Coastal salt affected alluvial soils**

Alluvial soils with high total soluble salts (Electrical conductivity greater than 4 mmhos/cm) are included under this group. The salinity of soil may be due to littoral deposits or the incursions of brackish tidal water. The salts are mainly composed of chlorides and sulphates of sodium, magnesium and to a lesser extent of calcium and potassium. Bicarbonates and carbonates are rarely found. Soils in lacustrine sediments of the lake Chilka also get affected by salts due to flooding of brackish lake water during monsoon and a build up of subsoil salinity due to high ground water table under lowlying situation.

#### **5. Deltic alluvial soils**

These soils have variable texture ranging from coarse sands to clays, depending upon the geomorphology of flood plain and the type of alluvium carried by the flowing river. The delta areas of the state show four well defined divisions from north to south such as (a) north Balesore containing sandy or sandy loam soil, (b) delta of Baitarani and Brahmani with soil varying from clay loam to stiff clay, (c) delta of Mahanadi with soils stratified into clay, silt sand and greys and (d) Rushikulya delta which is more sandy in nature.

These soils are generally fertile, but soils with low nitrogen and phosphorus are also found. The sandy alluviums of river Subarnarekha are deficit in potassium too. Soil reaction is slightly acidic to neutral.

#### **6. Black soils**

These are formed due to specific lithology or topography. Parent rocks of basic granulites, calc-gneiss, pyroxenites and granodiorites are conducive to formation of black soils. These rocks invariably contain plagioclases in appreciable amounts, which on weathering makes the soil environment rich in calcium. A lime kankar zone at some depth in the profile and free carbonates are usually present. Soils exhibit deep and wide cracks in summer seasons. The texture is clay and the structure is angular blocky. The water infiltration in these soils is slow and erosion on upland situation is severe. Soils are low to moderate in nitrogen and potassium, rich in calcium and respond to 10 nitrogen and phosphorus. Soils are moderately alkaline (pH 7.5 to 8.5).

#### **7. Mixed red and black soils**

Catenary formation of such soils are encountered in areas of predominately red soils. Red soils generally occur on upland ridges, while black soils are found on lower topographic situations, due to enrichment of calcium on their exchange complex, fine textured colluvium and alluvium.

## **8. Brown forest soils**

These are mainly brown coloured, formed in association with forest growth. The organic matter is moderate to high in these soils. These are fertile, slightly acidic and are suited for horticultural crops in higher elevations.

### **Problem Soils and their Management**

More area can be brought into cultivation if the problematic soils are properly reclaimed and managed.

#### **Problem soils**

The problem soils of Orissa can be grouped into three, classes, viz., 1. Upland, low fertile, low water retentive acidic soils, 2. Low land soils posing iron toxicity problems and 3. Coastal salt affected soils.

##### **1. Low fertile acidic soils**

The red and laterite and lateritic group of soils generally belong to this category which constitute about two-third of the total areas in the state. These soils have been developed due to intensively weathered parent material of varying composition of sandstone, quartzite, granite gneiss, khondalities either in situ or over transported material. Soil developed due to ferruginous sandstone belonging to the Benchmark soils of Bhubaneshwar series are acidic in nature and medium in organic carbon content. The texture of these soils varies from sandy loam to sandy clay loam with depth. The available water holding capacity of these soils is low.

Soils are highly permeable and susceptible to droughts during frequent dry spell in the rainy season emergence of seedling is obstructed due to a shallow crusting developed after beating action of a rain because of cementation of colloidal iron oxides.

Soils have low nutrient retention capacity and are strongly acidic. Soils contain low available nitrogen, phosphorus and potassium. Legumes suffer from calcium deficiency. A mixed cropping of groundnut, redgram or finger millet-red gram is more remunerative than single rice crop. Productivity is low under the farming system, followed by local farmers.

##### **2. Low land soils posing iron-toxicity problems**

In the landscape of rolling topography, soils located on valley slope, toe-slope lands receive washing of lateritic constituents rich in iron due to seepage. Rice crops grown on such soils show bronzing due to iron toxicity which get accentuated under waterlogged situations developed due to underlying clay substratum that restricts vertical drainage.

### **3. Coastal salt affected soils**

These soils are developed along sea coasts constituting 0.4 m hectares. Otherwise salt free, alluvial soils get salt affected because of tidal incursions of brackish sea water and breach of salt embankment through high tidal bore during cyclones. In the districts of Puri and Ganjam, salt affected soils have originated because of flooding of lake Chilka. During rainy season the salt content is low (Electrical conductivity in 1:2 water extract is 2-3 m mhos/cm) because of dilution and flushing off salt through leaching under heavy rain, salt tolerant rice varieties are grown with fair yield under favourable climatic conditions.

In rainy season, deep standing water conditions prevails in the tract. But in the off monsoon period of November to May, the soil profile is progressively recharged with salts through capillary rise to sub-soil salts due to dessication. Practically the land remains fallow during the period and therefore the areas are mono cropping. Exchangeable sodium percent ranges from 18 to 27 per cent in the profile.

#### **Management**

General measures that are followed in the reclamation of these soils are mentioned here.

1. Acidic soils can be managed by the application of organic manures and liming material.
2. Improving drainage facilities by constructing deep drains around the field, checking lateral seepage water by constructing check embankments across the slope reduces the iron toxicity.
3. The sodium content of saline soils can be removed by flooding and by growing resistant varieties.

#### **Soil Fertility Status**

The major and micro nutrient content of the soils generally indicate the fertility status.

##### **1. Nitrogen, phosphorous & potassium status**

Soils of Orissa are generally low to medium in these nutrients.

##### **2. Secondary and micro nutrients**

About 2/3 rd of the cultivated area in the state is highly to mildly acidic in reaction and deficiency of calcium and magnesium has not been reported so far. In highly

leached sandy lateritic soils, zinc deficiency is occurred, which is corrected by application of 40-50 kg zinc sulphate per hectare.

Red and laterite soils are deficient in molybdenum. Boron deficiency is found in highly porous upland lateritic soils particularly in the surface due to heavy leaching. Application of 10 kg borax/ha or spray application of 0.1 to 0.2 per cent solution helped in correcting the deficiency. Bronzing in rice which is associated with higher iron concentration in the soil is observed mainly in the kharif season. It occurs in poorly drained acid soils especially those situated adjacent to ferruginous lateritic highlands. Bronzing is manifested due to presence of high amount of easily decomposable organic matter, application of sulphur containing fertilizers, insufficient supply of phosphorus and potassium excess iron and low manganese in the soils.

### **Fertilizer Recommendation**

Fertilizer recommendations of different crops in the state are given in Table.3.

#### **Fertilizer Recommendations of Different Crops in Orissa**

Sl.No	Crops	Nitrogen	Phosphorus	Potassium
		(kg/ha)		
1	Rice	60	30	30
2	Wheat (irrigated)	80	50	25
3	Wheat (rainfed)	30-40	50	25
4	Finger millet (Ragi)			
	a. kharif	30	15	15
	b. rabi & summer	50	25	25
5	Maize	100	50	50
6	Sugarcane	200	100	60
7	Potato	80-120	75	100
8	Jute	50-60	20-30	30-40
9	Groundnut	20	40	40
10	Pulses	20	30	20

### **Techniques for Efficient Fertilizer Use :**

The acceptability of a fertilizer source depends on agronomic efficiency and cost per unit of nutrient. The farmers are adopting the split application of nitrogen in order to improve its efficiency. In kharif season, it is applied in 2 or 3 splits to avoid the risk of

rain uncertainty. This not only improves the yield but also provides certain flexibility to the farmers in matching nitrogen application with weather conditions. Urea super granules or briquettes has been found to be very useful in improving the nitrogen efficiency however commercial production and marketing of super granules have not yet been there, and so farmers have not started using it. Incubation of dry soil with urea (4:1) for about 48 hours has been found to be highly beneficial. A rabi crop grown under stored moisture is unable to fully utilize the native soil nutrient and, therefore, it does well when fertilizer is placed deep. In rabi season NPI NPK are preferable for better efficiency. Granulated sources perform better than the powdered forms.

Under submergence condition the solubility of native phosphorus is higher. Completely water soluble sources are less efficient for upland red and lateritic soils due to high phosphorus fixation.

By the experiment results, legume particularly in neutral and alkaline soils show that nitrogen and phosphorus fertilizers (water soluble sources) mixed together give better result than applied separately, as phosphorus is required for efficient functioning of rhizobia. Therefore, under such condition di ammonium phosphate (DAP) should be preferred. The phosphorus application should be done in the furrows for better efficiency as by this a higher concentration of phosphorus in solution is developed in the rhizosphere of the plant root.

The native soil potassium is not sufficient to take care of the crop unless soil has medium to high level of available potassium. Non exchangeable soil potassium also contributes to availability. Rice straw and panicles have high concentration of potassium. If straw is incorporated into the field, only 5 percent of the total amount of potassium is removed. In coarse sandy soils, split application of potassic fertilizer has yielded good results.

Among the micronutrients, use of boron and molybdenum have been beneficial in many situations for upland cereals, pulses, and vegetables like tomato, cabbage and cauliflower.

