

# CHAPTER 4

## AGRICULTURE

### **OVER VIEW**

4.01 Agriculture is the mainstay of Orissa's economy providing livelihood support to a large section of the population. Agriculture and Animal Husbandry contributed 20.09% of the Net Domestic Product of the state in 2007-08 at 1999-2000 prices and provided employment directly or indirectly to around 70% of the total work force. The per-capita availability of cultivated land 0.39 ha. in 1950-51 has declined to 0.13 ha. by 2007-08.

4.02 Development of Agriculture in Orissa has lagged behind due to several constraints, like traditional method of cultivation, inadequate capital formation & low investment, inadequate irrigation facilities and uneconomic size of holdings. This dominant sector of the State's economy has become, more often than not, a helpless victim of natural calamities like flood, drought and cyclone. For sustaining economic development, much emphasis has been laid in the planning process for accelerating the pace of agricultural development, by increasing both production and productivity, taking steps to remove regional imbalances in cropping pattern and agricultural practices, evolving new variety of seeds, expanding irrigation facilities, extending supply of

institutional credit and also providing price support to farmers.

### **CROP IMPROVEMENT**

4.03 Domestication of plants has been done to increase yield, improve disease resistance, ease harvest, improve the taste & nutritional value and so such other characteristics of agricultural produces. Centuries of careful selection and breeding have had enormous effect on the characteristics of crop plants. Plant breeders use greenhouses and other techniques to get as many as three generation of plants per year, so that they can make improvements all the more quickly.

4.04 Improvement in production and productivity needs to be effected for meeting the increasing demand of the growing population to step up farmer's income and to increase agricultural exports. Taking all these aspects into consideration during the Seventh Plan, several new programmes were launched for development of Cereals, Pulses, Oilseeds, Jute etc. These programmes continued during the Eighth and subsequent Plan periods with the objectives of improving the level of production and productivity. Priority was laid on crop planning, productivity, expansion of area under cash crops, cropping intensity, use of fertilizers,

pest management, marketing and use of modern agricultural implements and farm machinery.

4.05 The State Government has developed a comprehensive Agricultural Policy during 2008. The Policy is intended to help rejuvenating the Agricultural Sector of Orissa and bringing improvement in the economic conditions of farmers. The main objectives set out in the State Agriculture Policy, 2008 are as follows:

- (i) *To bring in a shift from the present level of subsistence agriculture to a profitable commercial agriculture so that people would accept agriculture as a vocation.*
- (ii) *To promote sustainable agricultural development.*
- (iii) *To enhance productivity of important crops at least to match with national average (enhancing seed replacement, availability of quality planting materials, INM, IPM, Water Management, Farm Mechanization and Technology Transfer.*
- (iv) *To encourage crop diversification particularly in uplands and medium lands (e.g. Paddy to non-Paddy crops).*
- (v) *To focus on Horticultural crops including Dry Land Horticulture.*
- (vi) *To encourage modern farming system approach.*
- (vii) *To enhance water use efficiency through people's participation.*
- (viii) *To facilitate increased long term investment in agricultural sectors ( on farm as well as off farm) both by private sector, public sector and private and public partnership (PPP). Particularly for post-harvest management, marketing, agro-processing and value addition etc.*
- (ix) *To encourage contract as well as compact farming.*
- (x) *To increase access to credit for small and marginal farmers.*

- (xi) *To facilitate appropriate market linkages for agricultural produce with respect to which the State has competitive advantages.*
- (xii) *To implement integrated watershed development programme as watershed areas for National Resource Management (NRM) increased crop production as well as on farm and non-farm income.*
- (xiii) *To create appropriate institutions/ facilities to undertake regulatory enforcement and quality assurance activities matching to the emergent need.*
- (xiv) *To redefine the roles and responsibilities of the agricultural extension machinery by suitably restructuring the field extension setup.*

### **ENVIRONMENTAL PROBLEMS**

4.06 Agriculture may often cause environmental problems because it changes natural environment and produces harmful by-products. Source of the negative effects are:

- *Surplus of nitrogen and phosphorus in rivers and lakes.*
- *Detrimental effects of herbicides, fungicides, insecticides and other biocides.*
- *Conversion of natural eco-systems of all types into arable land.*
- *Consolidation of diverse bio-mass into few species.*
- *Soil erosion.*
- *Depletion of minerals in the soil*

### **ELEVENTH FIVE YEAR PLAN (2007-12)**

4.07 The objective of the 11<sup>th</sup> plan is to achieve 4% sustainable annual growth in agricultural production through better management of natural resources and scientific management of crops. It also aims at doubling farmers' incomes by the end of the Eleventh Plan. The following sectoral plan

strategies have been envisaged for realizing these objectives.

- *Substantially improve irrigation potential and its utilization.*
- *Improve water management, rain water harvesting and watershed development.*
- *Reclaim degraded land and focus on soil quality*
- *Bridge the knowledge gap through effective extension.*
- *Diversify into high value outputs, fruits, vegetables, flowers, herbs and spices, medicinal plants, bamboo, bio-diesel etc., but with adequate measures to ensure food security.*
- *Mixed farming to be encouraged and infarm animal husbandry and Fishery activities to be promoted.*
- *Provide easy access to credit at affordable rates.*
- *Improve the incentive structure and functioning of markets.*
- *Refocus on land reform issues.*

**PRODUCTION OF FOODGRAINS**

4.08 Food grain production in the State showing a fluctuating trend due to various natural calamities. During 2001-02, there was a record production of food grains of 75.40 lakh MT which declined to 35.55 lakh MT in 2002-03 due to severe drought in Kharif 2002. Again the food grain production increased to 71.52 lakh MT in 2003-04. Due to excessive rainfall with cyclonic weather in the coastal belt, the food grain production again declined to 69.65 lakh MT during 2004-05, which was less by 2.61% over 2003-04. During 2005-06, the food grain production in the State was about 73.59 lakh MT, which exceeds the food grain production of 2004-05 by 5.66% . But it is still 2.41% lower than the food grain

produced during 2001-02. During 2006-07, the food grain production in the state was about 73.45 lakh MT which is almost same as the food grain production in 2005-06. During 2007-08, the food grain production in the State has mounted to 81.44 lakh MT which is 10.88% more than the food grain production of 2006-07. Table 4.1 shows the food grain production in the State since 2002-03.

**Table - 4.1**  
**Food grain Production in Orissa.**  
( in lakh MT )

Total Food Crop	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Rice	32.44	67.34	65.37	68.59	68.25	75.41
Cereals	33.50	68.86	67.04	70.23	69.93	77.60
Pulses	2.05	2.66	2.61	3.36	3.52	3.84
Food grains	35.55	71.52	69.65	73.59	73.45	81.44

Source: Directorate of Economics and Statistics, Orissa, Bhubaneswar/ Directorate of Agriculture and Food Production, Orissa, Bhubaneswar.

**IRRIGATION**

4.09 Double cropping in existing farm land is one of the basic elements of green revolution. This presupposes two crop seasons per year instead of one that depend on the monsoon. So irrigation projects were built up to support crops with adequate water supply during the growing period. Water bodies were built up to store large volumes of monsoon water which were earlier drained into rivers and sea. Irrigated agricultural land comprises less than 30% of net area sown, but produces 40% to 50% of the World's food.

4.10 In Asia, irrigated land accounts for about 50% of the total amount of water diverted for irrigation, which in itself accounts

for 80% of the amount of fresh water diverted. In India, irrigation facilities cover about 43% of the rice growing area, where statewide distribution of irrigation is highly variable. In Andhra Pradesh, Haryana, Punjab, Tamilnadu over 95% of the area under rice/ paddy is irrigated. But in Bihar, Orissa, Uttar Pradesh only 30% to 45% of the cultivated area under paddy is irrigated.

**RICE**

4.11 Rice is the single most important food crop in India that occupies 44.0 million hectares of agricultural land which is the largest rice area in the world. It is grown in almost all states of India and the state of Orissa contributes 4.4 million hectares to rice cultivation practice (IRRI-2005). Rice is grown in three seasons in India. Autumn and winter (or Kharif) season from June to October and summer (or Rabi) from December to May. The Kharif season accounts for 88% and Rabi season accounts for 12% of the total production of rice.

4.12 Rice constitutes more than 90% of the total food grain production in the State. The average yield rate of rice in Orissa has increased from 15.34 quintal/ ha. in 2006-07 to 16.94 quintal/ ha. during 2007-08. The per capita production of food grains per annum, which was 185 kg in 2006-07, has also increased to 203 kg. in 2007-08.

4.13 The "Integrated Cereal Development Programme- Rice" is being implemented since 1994-95, with the objective of augmenting

paddy production and productivity as it is the single major cereal crop of the State. A major factor to boost agricultural production is to increase the coverage under HYV paddy. There has been a significant expansion of area under HYV paddy in Orissa despite inadequate irrigation facilities, shortage of inputs like HYV seeds, fertilizers and pesticides etc. During 2007-08, the area under HYV paddy has increased by 3.46% over 2006-07. The total irrigated and un-irrigated area under HYV paddy during 2007-08 was 3272.14 thousand ha. Area under HYV paddy over the years is presented in Table 4.2. In order to increase the production and productivity of rice, 144 Farmers Field Schools (FFS) were organised in non-ATMA districts and 7200 rice growers were trained in various aspects of rice production. During 2008-09, 178 Farmers Field School will be taken up for training of 7120 rice growers at a financial outlay of Rs.30.26 lakh.

4.14 During 2007-08, about 500 farmers were sent to different places within the state and 210 farmers to outside the state on exposure visits for experiential learning and adoption of best practices with an expenditure of Rs.11.72 lakh. It has been proposed to send 500 farmers on exposure visit within the state and 180 farmers to outside the state with an outlay of Rs.13.26 lakh during 2008-09.

4.15 With a view to encourage the farmers, to take up seed production of early varieties and to take up early varieties of paddy

suitable for escaping drought condition and saline– tolerant varieties of paddy in coastal districts, production incentive is being given to farmers @ Rs.100/- per quintal. During 2007-08, incentives amounting to Rs.31.47 lakh have been given for 3,14,700 qtls. of seeds. It has been proposed to provide incentive for 2,00,000 quintals during 2008-09 with an outlay of Rs.20.00lakh.

about 65,000 quintals of paddy seeds were sold to the farmers in a subsidized rate of Rs.130.00 lakh during 2007-08 and for encouraging use of green manure, incentives @ Rs.200/- per quintals for 935 quintals of Dhanicha seeds were provided to farmers. It has been programmed to distribute 400 quintals of green manure seeds at a subsidized rate during 2008-09.

4.16 In order to encourage varietal replacement and use of HYV paddy seeds,

**Table – 4.2**  
**Area under HYV Paddy in Orissa** (In thousand hectares)

Year	Autumn		Winter		Summer		Total	
	Irrigated	Un-irrigated	Irrigated	Un-irrigated	Irrigated	Un-irrigated	Irrigated	Un-irrigated
2000-01	32.03	367.48	866.08	1,155.97	206.74	-	1,104.85	1,523.45
2001-02	30.00	395.00	852.00	1,301.00	272.00	-	1,154.00	1,696.00
2002-03	20.99	382.66	859.63	1,225.75	177.55	-	1,058.17	1,608.41
2003-04	15.22	434.64	839.09	1,345.94	253.47	-	1,107.78	1,780.58
2004-05	28.00	406.00	925.00	1,351.00	293.00	-	1,246.00	1,757.00
2005-06	24.05	411.57	913.31	1427.90	325.49	-	1262.86	1839.46
2006-07	28.28	411.34	941.75	1466.62	314.60	-	1284.63	1877.96
2007-08	30.05	420.55	969.18	1518.62	333.74	-	1332.97	1939.17

Source : Directorate of Economics and Statistics, Orissa, Bhubaneswar.

**INTEGRATED SCHEMES OF OILSEEDS, PULSES, OIL PALM & MAIZE**

4.17 During 2004-05, Oilseed Production Programme (OPP), National Pulse Development Programme (NPDP), Accelerated Maize Development Programme (AMDP) and Oil Palm Development Programme (OPDP) have been merged into a single scheme named ISOPOM (Integrated Schemes of Oilseeds, Pulses, Oil palm and Maize) with 75:25 funding pattern between Central and State Governments. A programme with total outlay of Rs.16.85 crore including Rs.12.10 crore Central shares was proposed during 2007-08. Against this

proposal, Government of India have released Rs.7.50 crore during 2007-08 and the expenditure under the programme stood at Rs.8.76 crore by the end of January, 2008.

**Pulses**

4.18 Next to paddy, pulses are the important food grain crops. During 2007-08, the total area under pulses accounted for 8.50 lakh hectares, which constitutes 15.5% of the total area under foodgrain (54.80 lakh hectares) and contributed 4.73% (3.84 lakh MT) of the total food grain production of 81.44 lakh MT in the State. However the productivity of the pulses in the State is around 479 kg./

Hectare as against national average of 616 kg./ hectare. Non availability of suitable HYV seeds is the main constraint for productivity. Therefore, to meet the minimum requirement of the state, it has been proposed to increase the area under pulses and to raise productivity by adopting dry-land farming technique mixed and intercropping system and use of quality seeds and fertilizers. National Pulse Development Programme is being implemented in the State since 1994-95 with the objective of increasing production and productivity of pulses in the State. Assistance is being provided for breeder seeds, foundation seeds and block demonstration.

4.19 During 2007-08, 700 quintals of quality seeds sold to the farmers on subsidized rate and Rs.5.60 lakh has been spent for the purpose. To increase irrigation efficiency, 189 sprinkler sets have been supplied to the farmers at a subsidized rate with an expenditure of Rs.14.23 lakh. Besides, 148 Farmers Training Programmes were conducted for upgradation of farmers knowledge on crop production technology in which total 7400 farmers were trained with an expenditure of Rs.37.20 lakh @ Rs.15,000/- per training programme involving 50 farmers.

#### ***Oil Seeds***

4.20 The major oil seeds grown in the State are groundnut, sesamum, mustard and niger. Sunflower cultivation has also been

introduced in western Orissa. For improving oil seeds production in the State, emphasis is being laid on production of certified seeds, supply of input kits, subsidised sale of quality seeds, plant protection chemicals and equipments, and farm implements under the Centrally Sponsored Plan Scheme "Oil Seeds Production Programme" (OPP). The coverage under oil seeds in 2007-08 was 2.65 lakh hectares with production level of 1.72 lakh MT as against coverage of 2.57 lakh hectare and production level of 1.49 lakh MT during 2006-07. Out of the total area under oilseed crops during 2007-08, groundnut was cultivated in 84.09 thousand hectares which comprised 31.78% of the total area covered under oilseeds, followed by Niger (50.4 T.Ha.) 19.06% and sesamum (Till) (48.48 T. Ha.) 18.32%.

4.21 In order to improve the availability of HYV seeds, procurement of breeder seeds and production of foundation seeds and certified seeds under seed village programme are being given importance. During 2007-08, breeder seeds of 349 qtls. were procured from Govt. of India with an expenditure of Rs.16.77 lakh for production of Foundation and certified seeds as against 420 quintals of breeder seeds were procured in 2006-07 with an expenditure of Rs.18.89 lakh.

4.22 Under ISOPOM (Oilseeds), 27154 quintals of quality seeds of ground nut, sesamum, mustard were supplied to the

farmers at subsidized rate and an amount of Rs.428.68 lakh have been spent towards subsidy. Input subsidy is being provided on use of Gypsum and Rhizobium culture to boost the productivity of ground nut in the State. During 2007-08 (up to January, 2008), about 46792 ha. under gypsum and 13292 ha. under rhizobium were covered with an expenditure of Rs.134.83 lakh. In addition to these about 62516 nos. of Seed Minikits provided by Government of India were distributed to farmers free of cost.

4.23 During 2007-08, 70 nos. of Farmers Field School and 200 nos. of farmers training were conducted with an expenditure of Rs.37.00 lakh.

#### **COMMERCIAL CROPS**

4.24 The development of commercial crops like- sugarcane, jute, mesta, cotton, soyabean, groundnut, potato, chilly and onion is being given more thrust to improve the rural economy. Cotton is a major commercial crop predominately grown in the KBK districts in Kharif season. Area coverage under cotton is growing in Bolangir, Kalahandi and Rayagada districts. The production of cotton increased from 1.08 lakh bales in 2006-07 to 1.25 lakh bales during 2007-08. In the coastal districts, river bed potato cultivation is being promoted by using certified potato seeds and other

improved planting materials. Cultivation of Sugarcane, which is a high- value commercial crop, is being widely accepted by farmers. Steps are being taken to cover at least 1.5 lakh ha. under sugarcane during the next five years. The resulting production should provide sufficient feedstock not only to the existing sugar mills that are currently in operation in the State but also to the sugar mills that are likely to come up in the coming years. Sugarcane growers are provided with quality cane seeds, farm implements and drip irrigation under two schemes, namely, 'Sugarcane Development Programme' under the State Plan and 'Sustainable Development of Sugarcane Based Cropping System' under the Centrally Sponsored Plan. During 2007-08, 19.82 Th. Ha. area were brought under sugarcane cultivation with 1069.23 TMT production.

#### **CROPPING PATTERN**

4.25 Agro-climatic conditions exercise big influence on the type of crop to be grown in an area. About 74% of the cultivated area in the State is covered under paddy crop. Since the Eighth Plan, efforts are being made to divert land from paddy to cash crops like pulses, oil seeds, sugarcane, potato etc. to ensure better returns. Table 4.3 presents the cropping pattern of principal crops in Orissa from 2001-02 to 2007-08.

**Table - 4.3**  
**Cropping Pattern of Principal Crops in Orissa.**

(Figures in percentage)

Principal crop	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08 (P)
Paddy	76.2	77.7	76.4	76.9	75.46	75.70	73.72
All cereals	79.5	80.8	79.3	79.8	78.3	78.46	76.67
Total pulses	11.4	10.9	12.2	11.2	13.64	13.42	14.07
<b>Total food grains</b>	<b>90.9</b>	<b>91.7</b>	<b>91.5</b>	<b>91</b>	<b>91.94</b>	<b>91.89</b>	<b>90.74</b>
Oil seeds	5.5	4.9	5.2	5.6	4.57	4.38	4.38
Fibers	1.8	1.3	1.3	1.4	1.54	1.63	1.44
Other crops (sugarcane, potato, tobacco, chilly and ginger)	1.8	2.1	2	2	1.95	2.10	3.44
<b>All crops</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Total Area</b> (thousand hectare)	<b>5907</b>	<b>5499</b>	<b>5891</b>	<b>5840</b>	<b>5932</b>	<b>5880.17</b>	<b>6038.51</b>

P: Provisional Estimate

Source : 1) Directorate of Economics and Statistics, Bhubaneswar.  
2) Directorate of Agriculture and Food Production, Bhubaneswar.  
3) Directorate of Horticulture, Bhubaneswar.

4.26 From the above Table, it is clear that only paddy covered 93.72% of the total cropped area during 2007-08, followed by pulses (14.07%) and oilseeds (4.38%). The area under fiber crops accounted for 1.44% and other cash crops, which include sugarcane, potato, spices and tobacco etc. constituted 3.44% of the total gross cropped area under principal crops. Though the total crop area has increased by 2.69%, the percentage of foodgrain area to total cropped area has been declined by 1.79% over 2006-07.

### **CROPPING INTENSITY**

4.27 Cropping intensity is one of the indices of the level of agricultural development. The cropping intensity of the State went up from 151% in 2001-02 to 160% in 2007-08. Due to development of irrigation facilities more areas were brought under cultivation and farmers could raise more than one crop in same land

in the same year. Further, it is also revealed that the cropping intensity is highest in Puri district (211%) followed by Debagarh district (195%) and Jagatsinghpur district (193%). Lowest cropping intensity has been recorded in Sundargarh district (127%). Table 4.4 shows net area sown, gross cropped area and cropping intensity from 2000-01 to 2007-08. The cropping intensity shows an increasing trend since 2004-05.

**Table - 4.4**  
**Cropping Intensity during**  
**2001-02 to 2007-08**

(Area in' 000 Ha)

Year	Net area sown	Gross cropped area	Cropping intensity (%)
2000-01	5,829	7,878	135
2001-02	5,845	8,798	151
2002-03	5,680	7,853	138
2003-04	5,796	8,637	149
2004-05	5,739	8,718	152
2005-06	5,691	8,928	157
2006-07	5,654	8,960	158
2007-08	5,624	9,016	160

Source: Directorate of Agriculture and Food Production, Orissa.

**HORTICULTURE**

4.28 Orissa is blessed with varied agro-climatic conditions suitable for growing fruits, vegetables and spice crops. Hill tracts of KBK districts and of Kandhamal and Gajapati districts are suitable for intensive horticultural activities. The development of horticulture has importance not only for increasing the production of fruits and vegetables but also for improving the rural economy of the state by generating employment and income particularly for small and marginal farmers. Cultivation of commercial fruits, use of hybrid vegetable seeds, propagation of off-season vegetable cultivation, establishment of bio-centres for production of quality planting materials, use of quality potato seeds, installation of drip irrigation systems, beneficiary oriented cultivation of oil palm etc. are the major thrust areas in horticulture. Emphasis has been given for dissemination of technology by way of massive training programmes, incentives for production of quality planting materials and certified vegetable seeds.

4.29 National Horticulture Mission (NHM) is a Centrally Sponsored Plan scheme is in operation in 24 districts of the State with the objectives of increasing production of suitable fruits in the State thus enhance the economic status of farmers, promotion of export oriented agro-based industries through provision of subsidy on supply of quality planting materials, training and development of market

infrastructure etc. During 2007-08, it has been included under CSP scheme with a funding pattern of 85:15 between Government of India and State. The crops selected are mango, citrus, litchi and banana in fruits, cashew in plantation crops, ginger and turmeric in spices, betel vine and floriculture. The horticulture development programme is being conducted in the balance six Non-Mission districts, viz., Jharsuguda, Jagatsinghpur, Kendrapara, Jajpur, Boudh and Bhadrak through State plan scheme.

**FRUIT PRODUCTION**

4.30 During 2007-08, the area under fruit crops in the State was recorded as 295.50 thousand hectare comprising 148.24 th. ha. of mango, 23.10 th. ha. of banana, 26.77 th. ha. of citrus, 45.79 th. ha. of other fruits and 51.60 th. ha. of coconut. During 2007-08, the production of fruits was 11.54 lakh MT and 2824 lakh nuts. Table 4.5 shows the area, production of fruits in the State during 2006-07 and 2007-08.

**Table - 4.5**  
**Area, production and yield rate of fruits**

Name of the fruits	2006-07			2007-08		
	Area ('000 ha.)	Production ('000 MT)	Yield rate (Qil/ha.)	Area ('000 ha.)	Production ('000 MT)	Yield rate (Qil/ha.)
Mango	140.1	431.4	30.8	148.2	251.8	17.0
Banana	22.2	284.8	128.1	23.1	297.1	128.6
Citrus	26.5	206.0	77.7	26.8	211.7	7.9
Pine apple	0.7	7.4	108.5	0.7	7.5	109.0
Papaya	0.8	13.9	174.0	0.8	14.7	17.5
Coconut	51.0	2756*	5400**	51.6	2824*	5473**
Others	42.1	365.4	86.7	44.3	371.5	83.9
Total	232.4	1308.9	56.3	243.9	1154.3	47.3

\* in lakh numbers

\*\* numbers / hectare

4.31 For encouraging farmers to establish fruit orchards on their holdings assistance up to 75% of the cost of cultivation is being provided to the farmers @ Rs.15750/- per ha. of mango, Rs.11,250/- per ha. of cashew, Rs.9658/- per ha. of citrus, Rs.7875/- per ha. of litchi and 50% cost of cultivation @ Rs.15,000/- per ha. of banana under NHM. New fruits orchards consisting 14305 ha. of mango, 6000 ha. of cashew, 600 ha. of anla, 123 ha. of litchi, 750 ha. of banana and 329 ha. of citrus have been established with an expenditure of Rs.19.81 crore. Besides, 1200 ha. of mango, 152 ha. cashew, 155 ha. citrus, 73 ha. litchi, 150 ha. banana and 90 ha. anla have been taken up in non-mission area. It has been programme to cover 15500 ha. for plantation of mango, 6000 ha. cashew, 100 ha. litchi, 1800 ha. banana and 650 ha. of citrus during 2008-09 with an investment of Rs.32.88 crore..

**VEGETABLE DEVELOPMENT**

4.32 Suitable agro-climatic conditions and growing market demand has created a lot of scope for vegetable cultivation in the State. During 2007-08, the area covered under vegetable cultivation was about 133.12 thousand hectare and vegetable production was about 524.29 TMT. In order to increase the production and productivity of vegetables,

3.75 lakh nos. of vegetable minikits and 6181 quintals of potato seeds have been distributed among the farmers at a subsidized rate during 2007-08 under NHM programme. Also there is a programme to distribute 3 lakh nos. of vegetable, minikits and 7000 quintals of seeds potato to the beneficiaries during 2008-09.

**FLORICULTURE**

4.33 In order to meet the increasing demand of people for flower in cities and urban areas, cultivation of flower like rose, gladioli, marigold and tuberose has been promoted in the State. Financial assistance up to 50% of the cost of cultivation is being provided to the small and marginal farmers and up to 33% to the other farmers, ranging from Rs.7920/- to Rs.45,000/- per ha. for taking up commercial cultivation of flower in this fields. During 2007-08, Marigold in 243 Ha., Gladiolus in 130 Ha., Rose in 112 ha. and Tuberose in 108 ha. were cultivated. There is a programme to cover 1700 ha. under floriculture with a financial outlay of Rs.387.44 lakh during 2008-09. Area and production of different floricultural crops in the State during 2003-04 to 2007-08 is given in Table 4.7 below.

**Table - 4.7**  
**Area and Production of different Floricultural Crops.**

(Area in ha./ Prodn. In Qtl.)  
(Gladioli – in nos.of lakh spike)

Year	Marigold		Rose		Gladioli		Tuberose.	
	Area	Production	Area	Production	Area	Production	Area	Production
2003-04	194.64	14,581	41.62	92.19	11.37	11.37	33.62	540
2004-05	221.05	16,599	46.14	98.63	12.07	12.06	34.92	555
2005-06	243.05	17,514	111.55	245.55	129.65	129.64	107.50	1515
2006-07	333.00	26,640	246.25	505.86	311.70	311.70	196.00	1960
2007-08	243.00	17,514	112.00	245.55	130.00	648.00	108.00	1515

Source: - Directorate of Horticulture, Orissa, Bhubaneswar.

### Spices Cultivation

4.34 Ginger and turmeric are the major spices grown in the State. Although the State has a major share in production of ginger and turmeric, the varieties cultivated are mostly traditional and 'low yielding' Emphasis is being given on replacing the traditional varieties with improved ones through NHM programme for which assistance @ Rs.11,250/- per hectare of cultivation is provided. During 2007-08, spices were cultivated in 175.18 th ha. with 463.64 TMT production. Table 4.8 shows the area and production of different spices during 2006-07 and 2007-08.

**Table - 4.8**

### Area and Production of Spice crops in Orissa.

(Area in 000' hectares) (Production in 000' MT)

Spice	2006-07		2007-08	
	Area	Production	Area	Production
Onion	28.51	260.00	28.77	262.37
Garlic	11.04	35.51	110.49	35.56
Coriander	19.07	9.07	19.07	9.6
Chilly	75.12	63.93	75.13	63.92
Ginger	16.07	31.40	16.34	32.44
Turmeric	24.74	59.35	24.82	60.34
Total	174.55	459.26	175.18	463.64

Source: Directorate of Horticulture, Orissa.

4.35 It is also recorded that out of total spices production of 463.64 TMT in the State during 2007-08, 45.04 TMT (9.7%) were produced in Phulbani district followed by 41.31 TMT (8.9%) in Bolangir district and 37.74 TMT (8.1%) in Angul district. Similarly, out of total 463.64 TMT spices production, 262.37 TMT (56.6%) were onion, 63.92 TMT (13.8%) were chilly and 60.34 TMT (13.0%) were turmeric. It is programmed to provide assistance for 600 ha. of ginger and 800 ha. of turmeric cultivation on farmers field during 2008-09.

### HUMAN RESOURCE DEVELOPMENT

4.36 During 2007-08, 25 numbers of district level shows including 5 shows in non-mission district have been organised. Besides, 5700 farmers have been imparted planting training and 350 farmers have been sent on exposure visit to inside & outside the State. Out of these, 2000 farmers were trained and 250 farms were visited outside the State from mission district.

**PRODUCTION OF QUALITY PLANTING MATERIALS**

4.37 Development of horticulture is dependent on supply and use of quality planting materials. These planting materials of mango, k. lime, litchi, papaya etc. are being produced in the departmental farms and nurseries of the State for different plantation programmes in farmer's field as well as for supply to public. During 2007-08, 13.3 lakh mango grafts, 1.5 lakh k. lime seedlings, 0.5 lakh litchi goatees, 1.3 lakh papaya seedling etc. have been produced and distributed to the farmers.

**ORGANIC FARMING**

4.38 Organic farming is an important present day requirement of human being. Assistance has been provided to the farmers of non-mission districts for construction of 430 vermi-compost units. Similarly 625 vermicompost units have been constructed in the mission districts during 2007-08. There is a programme to construct 1200 vermi-compost unit during 2008-09 in the State.

**INPUT SUBSIDY**

4.39 Development of horticulture is depending on supply and use of quality inputs. To popularize fruit plantation in backyard of rural households, 1.83 lakh quality planting materials of different fruits have been supplied to public at block level at nominal price during 2007-08. It has been

programmed to distribute 2.5 lakh quality planting materials during 2008-09.

**ESTABLISHMENT OF REGIONAL COCONUT NURSERY**

4.40 This scheme envisages production of coconut seedling in farms and nurseries with financial assistance from Coconut Development Board (CDB) as well as State Government on 50:50 basis and its distribution/ supply to the farmers for area expansion of coconut in the State. Under this programme raising of 75,000 nos. of coconut seedling is in progress during 2007-08.

**OIL PALM DEVELOPMENT PROGRAMME (ISOPOM)**

4.41 Oil palm is an important commercial crop being promoted in the State. The scheme envisages on providing subsidy for oil palm seedling as well as on maintenance cost on newly created plantation with a financial assistance from Government of India and State Government on 75:25 basis. During 2007-08, area expansion programme including demonstration of oil palm in farmer's field has been taken up in 740 ha. land.

**MICRO IRRIGATION PROGRAMME**

4.42 This programme is in operation since 2006-07. The scheme envisages providing subsidy for drip irrigation and sprinkler irrigation suitable for fruit, vegetable, floriculture and medicinal plants etc. During 2007-08, drip irrigation has been installed in

465 ha. and sprinkler irrigation has been provided in 802 ha. of farmer's land.

**LAND REFORMS**

4.43 The main objective of land reforms is to establish a new agrarian structure based on social justice by reducing inequalities in possession of lands. Land reform measures initiated in the state envisages abolition of intermediary rights, tenancy reforms like regulation of rent, provision of security of tenure to tenants, distribution of ceiling surplus land to the landless agricultural labourers and small land holders, consolidation of land holdings, and updating and maintenance of land records.

4.44 Land ceiling is imposed to acquire surplus lands by the Government and redistribute it among landless people. By the end of 2006-07, 1, 62,587.201 acres of ceiling surplus land has been distributed among 1, 45,523 landless persons.

4.45 Most of the farmers in the State possess marginal or no cultivable land due to fragmentation of holdings. Consolidation of holdings includes preparation, correction, and updating of land records and amalgamation of small and scattered holdings in a rational manner with a view to ensure better land management and optimum utilisation of limited water resources. From inception of consolidation measures, 10,039 nos. of villages were taken up for consolidation, out of

which 797 villages have been excluded from the consolidation due to unsuitability. 130 villages have been amalgamated with nearby villages through 'Boundary Change Proceeding (BCP)' and 112 villages have been newly created through BCP and the balance 9224 villages with an area of 1446813 hectares of land have been taken up for consolidation work. Consolidation work of 7962 villages with an area of 125032 hectare have been completed by the end of 2007-08, out of which 6 villages with 1017 hectares of land have been completed during 2007-08.

**CROP INSURANCE**

4.46 The comprehensive Crop Insurance Scheme was introduced in the State in 1985 with an objective to provide financial support to farmers in the event of crop failure and to restore credit eligibility of farmers after crop failure for subsequent cropping season. The scheme was modified and made more liberal by Govt. of India and renamed as National Agricultural Insurance Scheme (NAIS) which is being implemented since 1999-2000, Rabi season. All farmers both loanee and non-loanee, irrespective of the size of their holding, are covered under the scheme which covers risk in respect of loss of yield to crops due to natural calamities like flood, cyclone, storm, hailstorm etc. and other non preventive risks like natural fires, and lightening. Crops like paddy, ground nut, maize, niger, red gram, mustard etc. and horticultural crops viz. cotton, sugarcane, potato, ginger, onion,

banana etc. are covered under this scheme. The State Government and Government of India share the premium (as subsidy) on 50:50 basis.

4.47 During Kharif, 2007 about 8.98 lakh hectares of cropped land belonging to 8.37 lakh farmers were covered under the insurance scheme and the sum insured was about Rs.1109.62 crore. In Kharif 2007, claims, amounting to Rs.23.32 crore was paid to 64083 beneficiaries for loss of paddy crop in the district of Sambalpur, Sonepur, Bhadrak, Jajpur, Angul, Khurda and Bargarh.

4.48 Similarly in Rabi season, 2007-08 about 1.38 lakh hectare of cropped land belonging to 1.32 lakh farmers were covered under the scheme. No claim was made for loss of any crop during 2007-08 Rabi season.

#### **DRY LAND FARMING**

4.49 Dry land farming is practiced under rain-fed condition over more than 60% of the cropped area of the State with a much lower yield rate. The programme of cultivation under rainfed condition aims at minimising dependence on monsoon through conservation of water in small projects and maximising production through diversification of crops, mainly from dry land paddy to pulses and oilseed crops. The intensive approach of this programme envisages development of watersheds for proper management of rain water while the extensive approach aims at

diversification of crops. Hence, for stabilising production in rainfed areas, more particularly in the KBK, Gajapati and Kandhamal districts, farmers need to be motivated to divert uplands for growing drought resistant crops. Inter-cropping is a very appropriate practice in dry land agriculture since it offers a kind of insurance against total crop failure in drought years. It also ensures proper utilisation of soil moisture as well as plant nutrients. The ideal inter-cropping system in Orissa is cereals and pulses, pulses and ragi, maize and arhar, and groundnut and arhar.

4.50 Another measure taken to make dry land farming remunerative is mixed farming Paddy crops, even in the medium and low land, suffer from moisture stress in the event of early retreat of monsoon. Early maturing variety of paddy cultivation is the solution to this problem. To store the monsoon run-off and to regulate release of water to increase moisture content of soil, water harvesting structures are being constructed in watershed areas.

4.51 Adoption of land and water conservation techniques and alternative land use systems like agro-forestry, agro-horticulture, and silvi pasture development can be taken up in dry land areas for increasing and stabilizing production.

#### **CONSUMPTION OF FERTILISER**

4.52 Optimum use of fertilizer in opportune time is an appropriate strategy for increasing

agricultural productivity. It also protects land fertility by meeting the nutrition requirement of crops. The fertilizer consumption in the State has increased from 402.88 TMT during 2006-07 to 451.90 TMT during 2007-08 showing an increase of 12.17%. Out of total 451.90 TMT, 272.10 TMT was Nitrogen, 116.77 TMT phosphates and balance 63.03 TMT potassium. The per hectare fertilizer consumption has been estimated at 52 kg., as against 47 kg. estimated during 2006-07. Further, it also reveals from the source that per hectare consumption of fertilizer in Balasore district found to be highest (126 kg./ha.) followed by Bhadrak (114 kg./ha.) and Bargarh district (107 kg./ha.). Lowest consumption has been recorded in Kandhamal district i.e. only 6 kg./ha. during 2007-08. Table 4.9 shows the fertilizer consumption in the State since 1961-62 to 2007-08.

**Table - 4.9**

**Fertiliser Consumption in Orissa**

(000' MT)

Year	Nitrogen (N)	Phosphates (P)	Potash (K)	Total	Kg. / hect.
1961-62	4.38	0.49	-	4.87	0.76
1971-72	37.43	8.38	4.01	49.82	7.25
1981-82	54.16	17.92	9.91	81.99	9.68
1991-92	126.22	41.52	28.29	196.03	19.96
2001-02	221.17	71.94	51.55	344.66	41.00
2002-03	185.41	62.86	42.29	290.56	39.00
2003-04	210.07	66.64	40.50	326.21	39.00
2004-05	223.54	77.99	53.77	355.30	43.00
2005-06	243.21	91.05	60.63	394.89	46.00
2006-07	256.54	92.77	53.57	402.88	47.00
2007-08	272.10	116.77	63.03	451.90	52.00

P: Provisional

4.53 Further, it also reveals that fertilizer consumption in the State is too low as compared to all other major states and at all India level. During 2002-03, the fertilizer consumption in the State was 39 kg./ hectare while in the neighboring states like Andhra Pradesh and West-Bengal, it was 128.44 kg./hect. and 122.23 kg /hect. respectively and 84.82 kg./hect. at all India level, i.e. per hectare consumption of fertilizer in the State is about half of the per hectare consumption at all India level and about one-third of the consumption in the neighbouring States like Andhra Pradesh, West Bengal etc. Table 4.10 shows the fertilizer consumption in some selected states since 2001-02.

**Table - 4.10**  
**Consumption of Fertilisers**  
**in some selected States.**

(kg./hect.)

Name of the State	2001-02	2002-03	2003-04	2004-05	2006-07
Andhra Pradesh	143.47	128.44	145.30	155.80	203.61
Assam	38.81	42.73	47.50	41.60	49.26
Bihar	87.39	87.15	81.00	85.70	152.32
Gujarat	85.52	77.76	94.70	106.80	111.07
Haryana	155.69	152.79	161.70	166.20	166.72
Karnataka	101.48	90.91	78.80	110.80	117.34
Kerala	60.72	68.17	64.20	67.40	57.00
Madhya Pradesh	39.96	36.44	51.60	56.00	47.13
Maharashtra	78.24	73.80	64.20	77.70	84.52
<b>Orissa</b>	<b>39.00</b>	<b>39.00</b>	<b>37.10</b>	<b>40.40</b>	<b>43.00</b>
Punjab	173.38	174.99	190.10	192.50	210.06
Tamil Nadu	141.55	114.00	114.50	152.90	183.67
Uttar Pradesh	130.44	126.51	125.70	125.50	140.37
West Bengal	126.82	122.23	114.10	129.00	127.50
Rajasthan	38.88	28.54	67.40	36.60	36.29
<b>All India</b>	<b>90.12</b>	<b>84.82</b>	<b>88.20</b>	<b>96.60</b>	<b>104.50</b>

P: Provisional

Figures of Directorate of Agricultural & Food production, Orissa, Bhubaneswar.

- Source: 1) Centre for Monitoring Indian Economy (CMIE), December, 2002.  
2) Agricultural Statistics at a glance, 2003, Government of India.

4.54 In order to promote balanced use of fertilizers, soil health cards will be issued to farmers and awareness will be created to enhance its use. The Junior Agriculture Officers of irrigated tracts have been provided with portable soil testing kits for the purpose. As a supplementary source of nutrient in integrated nutrient management system promotion of bio-fertilizers like Rhizobium culture, Azoto bacter, Azospirillum, Azolla and fortified composting including vermin composting and green manuring has been emphasized.

4.55 In order to provide assistance to the farmers in tribal areas, where off-take of fertilisers is very low, a transport subsidy of Rs.100 per tonne has been made available by State Government.

### **PEST CONTROL**

4.56 Timely use of pesticides is essential to prevent crop damage. As high yielding varieties of crops are susceptible to pests and diseases, plant protection measures are equally important like use of fertiliser. However, excessive use of pesticides may be hazardous to human health. As such, Integrated Pest Management (IPM) was made a thrust area in the Tenth Plan in order to achieve effective pest control in one hand and to curb its possible adverse effects on environment on the other. This technology inter-alia envisages encouraging the use of biological pest control measures, identifying

the most poisonous/ toxic pesticides and putting a ban on their use, and restricting the use of pesticides in a sustainable manner.

4.57 Consumption of pesticides/ insecticides in Orissa during 2007-08 has been recorded as 1152.50 MT comprising 664.75 MT in Kharif and 487.75 MT in Rabi with per hectare consumption 148.24 gm. The corresponding figures for 2006-07 were 1132.50 MT, 673.25 MT, 459.25 MT and 148.94 gm. Table 4.11 shows the consumption of pesticides in Orissa during 2000-01 to 2007-08.

**Table - 4.11**  
**Consumption of Pesticides in Orissa.**

Year	Total consumption (in MT)	Consumption per hectare (gm./hect.)
2000-01	993.55	N.A.
2001-02	1018.00	N.A.
2002-03	682.30	N.A.
2003-04	1028.50	N.A.
2004-05	987.00	118.00
2005-06	1039.00	138.53
2006-07	1132.50	148.94
2007-08	1152.50	148.24

### **AGRICULTURAL MARKETING**

4.58 The co-operative movement with its basic democratic set-up plays a crucial role in accelerating the tempo of social and economic progress. The phenomenal growth of co-operatives in the State is responsible for institutionalising the marketing initiatives in the areas like credit, fertiliser, pesticides, improved seeds, other inputs, agricultural products and consumer articles etc. During 2005-06, the total number of co-operative

societies was 4,612 with a membership of 52.22 lakh and working capital of Rs.3,273.56 crore. The Orissa State Marketing Federation has been functioning as the apex organisation with 51 Regional Co-operative Marketing Societies (RCMS) and 19 Co-operative Cold Storages. The Orissa State Tribal Development Co-operative Corporation and Orissa State Oil Seeds Growers' Federation are also functioning as apex marketing institutions. There are 213 Large size Agricultural and Multipurpose Societies (LAMPS) which provide a package of services including credit at a single contact point. One Jute Marketing Co-operative Society, 2 Coconut Growers' Marketing Co-operative Societies, 2 Cashew-nut Marketing Co-operative Societies, 2 Betel Marketing Co-operative Societies, 4 Forest Marketing Co-operative Societies, 27 Fruit and Vegetable Co-operative Societies, 15 Cotton Growers Co-operative Societies, 2 Sabaigrass Co-operative Societies and one Onion Co-operative Society are functioning for assisting the growers in procuring inputs and marketing the products.

4.59 Lack of marketing infrastructure leads to distress sale of farm products which works as disincentive for farmers' efforts. Therefore, farmers need to be assisted and advised on several aspects including market infrastructure, market intelligence, grading of farm produce and its proper storage. With

these ends in view, a scheme "Establishment of Krushak Bazar" under the Work plan has been introduced and this aims at creating primary rural markets extension, training of farmers and awareness campaigns.

**AGRICULTURAL CREDIT**

4.60 Agricultural credit is an essential input for augmenting agricultural production and helping the poverty stricken farmers of Orissa in meeting their investment requirements. Against the target of Rs.3738.57 crore, an amount of Rs.3657.28 crore of agricultural loan have been advanced during 2007-08 showing an achievement of 97.83% which is 10.23% higher than the agricultural loan advanced during 2006-07. Out of the total agricultural loan financed during 2007-08, the share of Co-operative Banks was 44.42%. Apart from crop financing, term lending for floriculture, horticulture, livestock, pisciculture, plantation and composite projects is also being encouraged. Table 4.12 reflects the amount of agricultural credit advanced in Orissa by different banks.

**Table - 4.12**  
**Agricultural Credit Advanced in Orissa.**  
(Rs. in crore)

Year	Commercial Banks	RRBs	Co-operative Banks	OSFC	Total
2001-02	266.4	396.20	532.25	0.54	928.99
2002-03	281.4	437.29	609	0.26	1,046.55
2003-04	434.9	602.55	724.03	0.31	1,326.88
2004-05	627.9	932.56	971.26	0.22	1,904.03
2005-06	842.3	1257.65	1443.06	0	2,700.71
2006-07	1224.93	516.15	1576.87	0	3317.95
2007-08	1513.87	518.74	1624.67	0	3657.28

Source: State Level Bankers' Committee, Bhubaneswar

**AGRO SERVICE CENTRE (ASC)**

4.61 Agro Service Centre helps farmers to use hired tractors and other agricultural implements. Establishment of Agro Service Centres has been taken up through APICOL under State Plan funded self employment programme and under RLTA for KBK districts with cost limited to Rs.2.00 lakh per unit. During 2007-08 (up to January, 2008) 209 ASCs have been setup and subsidy amounting to Rs.248.80 lakh has been released. It has been programmed to setup 250 ASCs during 2008-09.

**SOIL CONSERVATION AND WATERSHED DEVELOPMENT**

4.62 Watershed Development Programmes focus on harnessing and conserving land and water through various soil and water conservation interventions coupled with crop substitution and mixed cropping practices for increasing and sustaining the productivity of land and improving livelihood of the community. Soil Conservation activities are being taken up on watershed basis. Integrated Wasteland Development Project aided by the World Bank, Indo-Danish Comprehensive Watershed Development Project, National Watershed Development Project in rainfed areas and River Valley Programme under Central Sector are the important soil and water conservation programmes which are being implemented in the State. The primary objectives of these

programmes are to prevent land degradation, promote and balance the ecosystem, enhance soil capacity to retain moisture, and increase the fertility and productivity of the soil. People's participation has been built into the programmes at all stages, from planning to execution.

4.63 The total degraded land in the State is 61.21 lakh ha. which works out to 39.31% of the total geographical area of the State. By the end of 2006-07, 14656 water harvesting structures have been completed and about 156.17 thousand hectares irrigation potential have been created. During 2007-08, 703 water harvesting structure have been completed and irrigation potential to the tune of 9.235 th. ha. were created. It has been targeted to complete 942 WHS during 2008-09 with an aim to create 9.407 thousand hectare additional irrigation potential in Kharif session.

**WATERSHED MISSION**

4.64 Watershed Development Programmes are currently being implemented in the State under various Centrally Sponsored Schemes like Drought Prone Area Programme, (DPAP), Integrated Watershed Development Programme (IWDP), National Watershed Development Programme for Rainfed Area (NWDPA), River Valley Project (RVP), etc. The Watershed Development Programmes are also implemented with Additional Central

Assistance received under RLTAAP for KBK districts. One externally aided project funded by DFID namely Western Orissa Rural Livelihood Project (WORLP) is also currently being implemented in Baragarh, Kalahandi, Bolangir and Nuapada districts. The broad objectives of the mission are as follows:-

- i. *Identification and prioritization of blocks and GPs on the basis of some identified objective criteria such as moisture index, area under assured irrigation, topographical features and availability of waste land where comprehensive treatment is needed for improving soil and moisture regime.*
- ii. *Identification of particular watersheds.*
- iii. *Preparation of integrated watershed development programmes through active community participation.*
- iv. *Development of waste lands through appropriate interventions.*
- v. *Conservation of run-off water, recharging of aquifers, harvesting of rain-water and formulation and implementation of other related programmes.*
- vi. *Promotion of self-help groups of land- less persons.*

4.65 The soil and water conservation activities include construction of water harvesting structures, check dams, nalla bonding, contour trench, village tanks, storage tanks, gully plugging etc. Besides, appropriate plantation in the degraded lands and vegetative treatment in the catchments are also taken up under this programme.

4.66 The Orissa Watershed Development Mission (OWDM) was set up as a State level Umbrella Institution for monitoring, coordinating and strengthening the watershed

programme in the State. The watershed programmes were implemented through various Government agencies that acted as PIAs (Project Implementing Agency). In order to strengthen the effective implementation of the programme, offices of the Project Directors (Watersheds) have been created in Bolangir, Nuapada, Kalahandi and Baragarh districts. The programme in these districts are being monitored, supervised and implemented through Project Director, Watersheds. Emphasis is being given on community participation in Watershed Development programme. Besides, emphasis have also been given towards building the capacity and empowering the community to implement watershed programmes. Presently 32131 SHGs are functioning in various watersheds with 3.96 lakh members and 61,557 user groups have been formed with 6.16 lakh user members who have contributed Rs.21.78 crore towards Watershed Development Funds.

4.67 Integrated Wasteland Development Programme (IWDP) is being implemented in 23 districts except Bhadrak, Boudh, Jagatsinghpur, Kandhamal, Kendrapara, Nuapada and Puri. At present 1046 micro watershed projects are functioning under the scheme. Total outlay of these projects is Rs.307.57 crore for treating 5.44 lakh hectares, against which Rs.149.12 lakh have been released and Rs.127.19 crore have

been utilized for treating 2.34 lakh hectares. About 32,668 ha. was treated by utilizing 21.05 crore during 2007-08,.

4.68 Under the RLTAAP for KBK districts, 314 micro watershed projects have been taken up during 2002-03 with project cost of Rs.100.57 crore with tractable area of 1.67 lakh ha. Out of this provision, so far Rs.85.93 crore has been utilized treating 1.32 lakh ha. of land. This includes utilization of Rs.8.31 crore for treating of 0.13 lakh ha. during 2006-07.

4.69 Drought Prone Area Programme (DPAP) is in operation in 8 districts covering 47 identified blocks. Total 1319 micro watershed projects were sanctioned under the programme with project cost of Rs.381.54 crore for treatment of 6.678 lakh hectare, against which Rs.163.32 crore have been released by the end of March 2008, out of which Rs.135.62 crore have been utilized in treating 2,41,686 hectares. During 2007-08, 27,652 ha. were treated by utilizing 19.29 crore.

4.70 National Watershed Development Project for Rain-fed Areas (NWDPA) is being implemented as a component of CSP Macro Management of Agriculture. 237 watersheds (221 new and 16 spillover watershed of 10<sup>th</sup> plan) are programmed to be implemented during 11<sup>th</sup> plan period with

treatable area of 1,17,564 ha. and project cost of Rs.11937.70 lakh. During 2007-08, an amount of Rs.1301.98 lakh has been allotted and by now the same has been utilised treating an area of 28933 ha.

4.71 River Valley Project (RVP) is in operation in four catchments viz. Hirakud, Rengali – Mandira, Indrabati and Upper Kolab with the objective of treating degraded catchments area of multipurpose inter-state reservoirs with appropriate soil & water conservation measures to check silt inflow and to enhance the productivity of degraded land. During 11<sup>th</sup> plan period, it is proposed to take up 23 watersheds in above catchment with treatable area of 19,296 ha. During 2007-08, an amount of Rs.4.28 crore has been spent out of allotted funds of Rs.5.28 crore and 9,322 ha. land has been treated. It is proposed to treat an area of 7776 ha. with an outlay of Rs.5.28 crore during 2008-09.

4.72 The Western Orissa Rural Livelihoods Project (WORLP) was launched in 2000-01 with DFID assistance. The project is currently under operation in 14 blocks of Bolangir, 5 blocks of Nuapada, 6 blocks of Kalahandi and 4 blocks of Baragarh district. During 2007-08, the programme is being implemented in 290 watersheds and an amount of Rs.30.61 crore have been utilized and an area of 18,000 ha. was treated.

**AGRICULTURAL PROMOTION AND INVESTMENT CORPORATION LTD (APICOL)**

4.73 The Agricultural promotion and Investment Corporation of Orissa Limited (APICOL), since its inception in 1996 as a promotional organization, is engaged in promotion of commercial agricultural enterprises including agro based food and non food processing industries in the State. The corporation has been implementing various programmes through the agricultural extension network of the Department to encourage investment in the field of agriculture. It also acts as the channelising agency for release of subsidy under farm mechanisation component of the Work Plan for Macro Management of Agriculture.

4.74 During the year 2007-08, 57 agricultural enterprises (38 Agro Service Centres and 19 Commercial Agriculture Enterprises) have been promoted by APICOL with an investment of Rs.114.10 lakh. During 2008-09, it has been proposed to setup 100 commercial Agro-Enterprises and the required subsidy will be met out of self employment programme.

**FARM MECHANISATION**

4.75 Farm Mechanization has great significance for enabling farmers to take-up timely and quality agricultural operation, reducing cost of production and improving productivity. Various farm machineries, viz., power tiller, tractor, power raper, power

rotaretor, transplanter etc. have been supplied to the farmer at a subsidized rate worth of Rs.9.69 crore during 2007-08.

Farm Machineries	Nos. supplied	Subsidy released (Rs. in lakh)
Tractor	630	189.00
Power Tiller	2360	670.50
Hydraulic trailer	145	28.80
Reaper	130	22.11
Power roatvator	40	7.05
Others	248	51.71

4.76 During 2008-09, it has been proposed to subsidies 1817 power tillers, 40 paddy reapers, 24 paddy transplanters, 51 power oriented implements, 72 specialised power driven implements, 2042 tractors, and other farm mechanization to the farmers with total financial provision of Rs.849.58 lakh.

**ENTREPRENEURSHIP DEVELOPMNET PROGRAMME**

4.77 During 2007-08, an amount of Rs. 3.90 lakh has been spent towards imparting training to 65 unemployed graduates under the Programme. During 2008-09, it is programmed to impart training to 210 unemployed graduates with an outlay of Rs.10.00 lakh.

**ORISSA AGRO INDUSTRIES CORPORATION (OAIC)**

4.78 OAIC is engaged in marketing of various agricultural inputs including agricultural machineries/ equipments through a wide network of district as well as branch offices. Besides, the Corporation also executes tube wells, bore wells, direct lift irrigation projects for individuals as well as communities. It also provides other inputs

such as fertilizer, pesticides, cattle and poultry feeds to the farmers.

4.79 During 2007-08, the Corporation has made a turnover of Rs.109.08 crore against the target of Rs.133.08 crore. During 2007-08, the corporation has sold 711 tractors, 493 power tillers, 57 power reapers, 1726 diesel pump sets, 43 sprinkler sets. The Corporation has also energized 152 shallow tube wells and 57 bore wells during 2007-08.

#### ***CENTRAL RICE RESEARCH INSTITUTE (CRR)***

4.80 The Central Rice Research Institute (CRR) was established in Orissa in 1946 against the backdrop of the great Bengal Famine of 1943. This institute not only played a key role in ushering the country in an era of green revolution leading to self sufficiency in food supply in about 26 years from its inception, but also brought glory to the nation by providing research support to become the second largest exporter of rice in the world. The goal of the institute is to improve the income and quality of life of rice farmers. The main objective of the institution is to conduct basic, applied and adaptive research on crop improvement and resource management for increasing and stabilizing rice productivity in different rice ecosystems with special emphasis on rainfed ecosystem and the related a biotic stresses. Till now, about 75

high yielding varieties of rice have been developed for different types of land under different maturity groups by this institute and these have been released for cultivation by Central Variety Release Committee (CVRC) as well as State Variety Release Committee (SVRC). Besides, many varieties developed by this institute have been released in other States, by respective State Variety Release Committees and also in various countries. The farmers of Orissa have benefited a lot by cultivating the improved High Yielding Varieties (HYV) developed by this institute. Rice-fish farming system technology has been developed by CRR, Cuttack for rainfed low lands. This technology involves rain water harvesting-cum-recycling and diversified farming system. This farming system can increase farm productivity and income by about 15 times as compared to traditional rice farming and it can also generate employment round the year.

4.81 During 2008 the institute introduced five new high yielding varieties of seeds namely Satya Krishna, Nua lalajira, Nua Dhusura, Hanseswari and Chandan recommended for irrigated and rainfed shallow low land/ up land, deep water areas. The details of these high yielding varieties of seeds are given in table 4.13.

**Table - 4.13**  
**New high yielding variety of seeds introduced by CRRI**

Year	Name of the variety	Duration (days)	Yield (t/ha.)	Remarks
2008	Satya Krishna	135	5.0 – Kharif 6.0 – Summer	Recommended for irrigated and rain-fed shallow lowlands
2008	Nua Kalajira	145	3.0 – Kharif	Recommended for shallow low lands
2008	Nu Dhusura	145	3.0 – Kharif	Recommended for shallow low land
2008	Hanseswari	Photosensitive flowers in 4 <sup>th</sup> week of October	5.0 – Kharif	Recommended for rain-fed semi-deep water ecology of Orissa
2008	Chandan	125	6.0 - Summer	Recommended for cultivation in Summer season

Source: CRRI, Katak

4.82 This institute has also played a major role in transfer of technology from laboratory to farmer's field through Krishi Vigyan Kendras (KVKs), Institute of Village Linkage Programme (IVLP), Farming System Research Education (FSRE) etc.

4.83 Suitable rice production technologies for rainfed up lands, low land and irrigated rice including production technologies for hybrid rice and scented rice were field tested and transferred to farmers. The institute has also taken steps for evaluation and popularization of its varieties through frontline demonstration in farmer's fields. In addition, farmer's advisory service is provided through regular radio talk and TV telecasts on rice production technologies. The Institute also provides quality seeds of rice to farmers, government agencies and to others. The institute also provides consultancy services to interested agencies particularly in the field of testing of agrochemicals.

#### **ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY (OUAT)**

4.84 The Orissa University of Agriculture and Technology (OUAT), the second oldest

Agricultural University in the Country has grown into a full-fledged Institution having 7 constituent colleges imparting education and training in various aspects of Agriculture, Animal Husbandry and Veterinary, Forestry, Fisheries Sciences etc. The University has developed a research base for generation of technology capable of improving productivity, stability, profitability and sustainability of the major farming systems under varied agro-climatic situations of the State. Dissemination of the latest technology covering different areas of agriculture is achieved through various types of training, distance education programme, on-farm trials and demonstrations in farmer's fields, farmers fair and various Mass Communication programmes.

4.85 During 2007-08, 382 students passed degree courses on various streams viz. Agriculture, Agriculture Engineering, Fisheries, Home Science, Veterinary Science etc. Similarly, 159 students passed the Post Graduate degree and 29 students were awarded Ph. D. degrees during 2007-08. A new P.G. course in Agri-business

Management is being introduced in the university from 2007-08. There is a proposal to open a college of Horticulture at Chipilima, Sambalpur. During 2007-08, the university has made significant contributions in terms of crop improvement, crop production and crop protection.

4.86 During 2007-08, the university has produced 2.96 lakh quality planting materials of mango, guava, litchi, rose, cashew and other forest species and ornamental seedlings. Besides, OUAT also produced 351 quintals of Breeders, 8963.4 qtls. of Foundation and 1129.2 qtls. of Certified paddy seeds and 684.7 quintals of non-paddy seeds during 2007-08. There is a programme to take up production of 986.8 quintals breeder seeds, 7321 quintals foundation, 2012 quintal certified seeds of different fruit and vegetable crops and 4.73 lakh planting materials of different silvi cultural and horticultural crops in 2008-09.

4.87 At present, 27 Krishi Vigyan Kendras are functioning under OUAT. During 2007-08, 1161 training programmes on transfer of technologies to the farmers covering 18,385 farmers including farm women and rural youth were conducted. Besides, total 2875 frontline demonstrations on different crops in an area of 89.70 ha. were conducted in 2007-08. Also 201 farmers have been enrolled in 10 courses offered by the Distance Education Projects of the university during 2007-08. Advisory

Services have been rendered to 4519 farmers through Agricultural Technology Information Centre.

#### **AGRICULTURAL CENSUS**

4.88 According to Agricultural Census held in 2000-01, there were 40.67 lakh operational holding in the State covering an area of 50.81 lakh hectares as against 39.66 lakh operational holding covering an area of 51.44 lakh hectares during 1995-96 Census. Out of total 40.67 lakh operational holding recorded in 2000-01 census, 22.94 lakh holding (56.4%) belonging to Marginal Category, covered 22.7% of total area and 11.14 lakh small holdings (17.4%) covered 30.4% of the total area i.e., marginal and small holdings together constitutes 83.8% of the total nos. and 53.1% of the total area under operational holdings. The balance area belongs to semi-medium, medium and large operational holding. The number and area of operational holding for the last two agricultural censuses is given in table 4.14.

4.89 It is also revealed from the table that while the number of operational holdings exhibit increasing trend, the area under operational holdings show a declining trend. Also, while the average size of holding was 1.34 hectares in 1990-91, the same has decreased to 1.25 hectares in 2000-01.

4.90 Agricultural Census, 2000-01 also reveals that highest number of operational holdings were recorded in Mayurbhanj district

(3.26 lakh) followed by Ganjam district (2.80 lakh) and Keonjhar district (2.33 lakh), while the lowest number of holdings were recorded in Deogarh district (0.40 lakh). The same constituted respectively 8.0%, 6.9%, 5.7% and 1.0% of the total number of operational holding in the State.

4.91 Distribution of land holdings by different social groups as per 1995-96 & 2000-01 agricultural census is given in Table 4.14. As can be seen from this table there

were 5.69 lakh SC and 12.30 lakh ST operational holdings in the State with 5.14 lakh and 16.31 lakh ha. of total area respectively in 2000-01. Table 4.14 shows that the SC farmers had a share of 13.99% in the total number of holdings while their share in the total area constituted only 10.12 %. Similarly, the number of holdings of ST farmers formed 30.24% to the total number of holdings and their share in the total operational area was 32.10%.

**Table - 4.14**

***Distribution of Holdings among different Social Groups as per different Agricultural Census***

Holding size	Year	No. of operational holdings			Area of operation		
		(in lakh)			(lakh hectare)		
		SC	ST	All groups	SC	ST	All groups
Marginal (below 1.00 Ha.)	1995-96	3.73	5.87	21.45	1.66	3.09	10.64
	2000-01	3.93	6.39	22.95	1.81	3.47	11.55
Small (1.00 - 2.00 Ha.)	1995-96	1.22	3.54	11.06	1.65	4.88	15.22
	2000-01	1.25	3.70	11.14	1.71	5.17	15.44
Semi- medium (2.00 - 4.00 Ha.)	1995-96	0.43	1.81	5.44	1.13	4.85	14.51
	2000-01	0.43	1.70	5.01	1.12	4.58	13.44
Medium (4.00 - 10.00 Ha.)	1995-96	0.07	0.51	1.56	0.39	2.81	8.64
	2000-01	0.08	0.47	1.45	0.45	2.65	8.18
Large (10 Ha. & above)	1995-96	0.01	0.04	0.15	0.06	0.66	2.43
	2000-01	0.01	0.03	0.13	0.05	0.45	2.20
<b>Total</b>	1995-96	<b>5.46</b>	<b>11.78</b>	<b>39.66</b>	<b>4.89</b>	<b>16.29</b>	<b>51.44</b>
	2000-01	<b>5.69</b>	<b>12.30</b>	<b>40.67</b>	<b>5.14</b>	<b>16.31</b>	<b>50.81</b>

Source: Agriculture Census.

