

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 22.46% of the Net Domestic Product of the state in 2006-07(A) at 1999-2000 prices and provided employment directly or indirectly to around 65% of the total work force as per 2001 Census. The per-capita availability of cultivated land was 0.39 ha. in 1950-51 and has declined to 0.14 ha. by 2004-05.

4.02 Development of Agriculture in Orissa has lagged behind due to several constraints, such as- 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.

AGRICULTURAL POLICY

4.05 Agricultural policy focuses on the goals and methods of agricultural production. At the policy level, common goals of agriculture includes –

- ◆ *Food safety: Ensuring that the food supply is free of contamination.*
- ◆ *Food security: Ensuring that the food supply meets the population needs.*
- ◆ *Food quality: Ensuring that the food supply is of a constant and known quality.*
- ◆ *Conservation*
- ◆ *Environmental impact*
- ◆ *Economic stability*

4.06 The State Government has developed a comprehensive Agriculture Policy and recognised agriculture as the status of an industry, considering the importance of this sector. The objectives of the above policy has been pursued vigorously during the Tenth Plan period to make Agriculture sector one of the growth engines for accelerating the pace of development in the State. The State Agriculture Policy, 1996 aims at doubling the production of food grains and oil seeds, generation of adequate employment opportunities in the rural sector and eradication of rural poverty within a specific

time frame. The main objectives set out in the State Agriculture Policy, 1996 are as follows:

- i. *To enhance the status of Agriculture from the present level of a subsistence one to a profitable and commercial venture, so that young persons can accept agriculture as a means of self employment.*
- ii. *To generate adequate employment opportunities.*
- iii. *To adopt integrated programmes for problem soils such as water logged areas, areas with soil erosion, dry / rain fed areas, area under shifting cultivation, waste land, saline and alkaline soil etc.*
- iv. *To create entrepreneurship in the field of agriculture and horticulture.*
- v. *To create skilled labourers for management of modern agriculture.*
- vi. *To help mechanization of agriculture to increase productivity.*
- vii. *To establish Agro-based and Food Processing Industries.*
- viii. *To provide irrigation facilities to 50% of cultivable land through completion of incomplete irrigation projects and promotion of individual and group irrigation projects.*
- ix. *To promote private enterprise in marketing of agricultural produces.*
- x. *To identify and promote thrust crops in different agro-climatic zones of the State.*
- xi. *To reorient agriculture towards export.*

ENVIRONMENTAL PROBLEMS

4.07 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 bio sides.*

- *Conversion of natural ecosystems of all types in to arable land.*
- *Consolidation of diverse biomass in to few species.*
- *Soil erosion.*
- *Depletion of minerals in the soil.*
- *Particulate matter, including ammonia and ammonium off-gasing from animal waste contributing to air pollution.*
- *Weed science – feral plants and animals.*
- *Odor from agricultural waste.*
- *Soil salivation.*
- *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 in farm 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 Agriculture is cited to have significant adverse impact on bio-diversity in many Nations. Bio-diversity Action Plans due to reduction of forests and other habitats are being taken when new lands are converted to farming. Some critics also attribute agriculture as the cause of current global climatic change.

ELEVENTH FIVE YEAR PLAN (2007-12)

4.09 The objective of the 11th 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.*

4.10 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. Table 4.1 shows the food grain production in the State since 2001-02.

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

Total Food Crop	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Rice	71.49	32.44	67.34	65.37	68.59	68.25
Cereals	72.81	33.50	68.86	67.04	70.23	69.93
Pulses	2.59	2.05	2.66	2.61	3.36	3.52
Food grains	75.40	35.55	71.52	69.65	73.59	73.45

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

IRRIGATION

4.11 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.

4.12 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

4.13 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 all most 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.

4.14 Rice constitutes more than 90% of the total food grain production in the State. The average yield rate of rice in Orissa which was 15.31 quintal / ha. in 2005-06 has increased to 15.34 quintal / ha. during 2006-07. The per capita production of food grains per annum, which was 180 kg in 2004-05, has also increased to 190 kg. in 2005-06 and which has remained at same level during 2006-07.

4.15 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. Area under HYV paddy has increased by 18.60% during the Tenth Plan Period, i.e. 2002-07. The total irrigated and un-irrigated area under HYV paddy during 2006-07 was 3162.59 thousand ha. Area under HYV paddy over the years is presented in Table 4.2. The State Agriculture Policy, 1996 accords priority to multiplication of high yielding varieties of seeds to replace the traditional varieties being used in the State. In order to increase the production and productivity of rice, 314 Farmers Field Schools (FFS) were organised and 15700 rice growers were trained in various aspects of rice production. It has been programmed to organise one FFS on rice in each block of non ATMA districts during 2007-08 and a total 3600 farmers will be trained in 144 nos. of FFS.

4.16 During 2006-07, about 1400 farmers were sent to different places within the state and 320 farmers to outside the state on exposure visits for experiential learning and adoption of best practices with an expenditure

of Rs.23.60 lakh. It has been proposed to send 500 farmers on exposure visit within the state and 210 farmers to outside the state with an outlay of Rs.11.72 lakh during 2007-08.

4.17 With a view to encourage the farmers, to take up seed production early 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 through Orissa State Seeds Corporation. During 2006-07, incentives amounting to Rs.35.00 lakh have been given for 35,000 qtls. of seeds. It has been proposed to provide incentive for 31,700 quintals during 2007-08 with an outlay of Rs.31.70 lakh.

4.18 In order to encourage varietal replacement and use of HYV paddy seeds, about 45,000 quintals of paddy seeds were sold to the farmers in a subsidized rate during 2006-07 and for encouraging use of green manure, incentives @ Rs.200/- per quintals of Dhanicha seeds were provided to farmers on 330 quintals of 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	1,427.90	325.49	-	1,262.86	1,839.46
2006-07	28.28	411.34	941.75	1,466.62	314.60	-	1,284.63	1,877.96

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

INTEGRATED SCHEMES OF OILSEEDS, PULSES, OIL PALM & MAIZE

4.19 During 2006-07, 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% and 25% financial assistance from the Centre and the State respectively. A programme with total outlay of Rs.11.43 crore including Rs.8.58 crore central shares was proposed during 2006-07. Against this proposal, Government of India had released Rs.5.24 crore during 2006-07 and the expenditure under the programme stood at Rs.7.15 crore.

Pulses

4.20 Next to paddy, pulses are the important food grain crops. During 2006-07, the total area under pulses accounted for 7.90 lakh hectares which constitutes 14.62% of the total area under food grain (54.03 lakh hectares) and contributed 4.79% (3.52 lakh MT) of the total food grain production of 73.45 lakh MT in the State. However the productivity of the pulses in the State is around 444 kg./hectare as against national average of 609 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.

4.21 During 2006-07, about 10.35 qtls. of Breeder Seeds of different pulse crops were procured through Govt. of India allocation for production of foundation seeds and 247 quintals of Foundation seeds were processed in 2006-07 for production of certified seeds. Subsidy to the tune of Rs.29.60 lakh was provided on 3700 qtls. of certified seeds sold to the farmers, it has been programmed to procure 21 quintals of Breeder Seeds for production of 100 quintals of foundation seeds and 2000 quintals of certified seeds during 2007-08 with an outlay of Rs.11.55 lakh. During 2006-07, 96 farmers training programmes were conducted and 4800 farmers were trained for up-gradation of their knowledge on production techniques.

Oil Seeds

4.22 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 2006-07 was 2.57 lakh hectares with production level of 1.49 lakh MT as against coverage of 2.71 lakh hectare and production level of 1.63 lakh MT during 2005-06. Out of the total area under oilseed crops during 2006-07, groundnut was cultivated in 30.6% of the total area covered under oilseeds, followed by Niger 21.3% and sesamum (Till) 19.6%.

4.23 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 were taken up during 2005-06 with an expenditure of Rs.28.56 lakh. During 2006-07, 420 qtls. of Breeder seeds were procured from Govt. of India with an expenditure of Rs.18.89 lakh and 939 qtls. of foundation seeds and 1600 qtls. of certified seeds have been produced.

4.24 Under 'Seed Distribution Programme', 80,615 qtls. of quality seeds of groundnut, mustard, till, niger, were supplied during 2006-07 to the farmers at subsidised rate with an expenditure of Rs.2.23 crore towards subsidy

for distribution of certified seeds. It has been programmed to distribute 73,000 qtls. of different certified seeds with an outlay of Rs.4.67 crore subsidy. Thirty farmers training programmes have been conducted in 2006-07, with an expenditure of Rs.4.50 lakh.

COMMERCIAL CROPS

4.25 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 0.57 lakh bales in 2005-06 to 1.08 lakh bales during 2006-07. 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. The production of sugarcane increased from 10.73 lakh M.T. during 2005-06 to 12.74 lakh M.T. during 2006-07.

CROPPING PATTERN

4.26 Agro-climatic conditions exercise big influence on the type of crop to be grown in an

area. More than 75% 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 2000-01 to 2006-07.

Table - 4.3
Cropping Pattern of Principal Crops in Orissa.

Principal crop	(Figures in percentage)						
	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07(P)
Paddy	77.5	76.2	77.7	76.4	76.9	75.46	75.70
All cereals	81.1	79.5	80.8	79.3	79.8	78.3	78.46
Total pulses	9.7	11.4	10.9	12.2	11.2	13.64	13.42
Total food grains	90.8	90.9	91.7	91.5	91	91.94	91.89
Oil seeds	5.9	5.5	4.9	5.2	5.6	4.57	4.38
Fibers	1.4	1.8	1.3	1.3	1.4	1.54	1.63
Other crops (sugarcane, potato, tobacco, chilly and ginger)	1.9	1.8	2.1	2	2	1.95	2.10
All crops	100	100	100	100	100	100	100
Total Area (thousand hectare)	5720	5907	5499	5891	5840	5932	5880.17

P : Provisional Estimate

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

4.27 From the above Table, it is clear that only paddy covered 75.70 % of the total cropped area during 2006-07, followed by pulses (13.4%) and oilseeds (4.4%). The area under fiber crops accounted for only 1.6% and other cash crops, which include sugarcane, potato, chilly, ginger and tobacco etc. constituted only 2.1% of the total gross cropped area under principal crops. The percentage of area under pulses & food grains has increased in 2006-07 over 2000-01

while that of paddy, cereals and oilseeds have declined.

CROPPING INTENSITY

4.28 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 158% in 2006-07. 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 (208%) followed by Jajpur district (190%) and Jagatsinghpur (188%). Lowest cropping intensity has been recorded in Sundargarh district (138%). Table 4.4 shows net area sown, gross cropped area and cropping intensity from 2000-01 to 2006-07. The cropping intensity shows an increasing trend since 2003-04.

Table - 4.4
Cropping Intensity for the Period
from 2001-02 to 2006-07 (P)

(Area in thousand hectares)

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

Source: Directorate of Agriculture and Food Production, Orissa.

HORTICULTURE

4.29 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. During the Tenth Plan stress was given for promoting integrated development of horticulture through area expansion of fruit crops, vegetables, spices, root and tuber crops and floriculture. Emphasis was also laid on dissemination of technology by way of massive training programmes, incentives for production of quality foundation and certified vegetable seeds.

4.30 'National Horticulture Mission' (NHM), a central plan scheme is operating in 19 districts of the state since 2005-06 with 100% central grant. The crops selected under the mission are mango, banana, litchi, citrus under fruits, category, cashew under plantation crops, category, spices like ginger and turmeric, betel vine and floriculture. Out of Rs.44.50 crore received from Government of India, an amount of Rs.39.06 crore has been utilized in 2006-07. During 2006-07 about 12.01 lakh mango grafts and 10.46 lakh cashew grafts have been supplied to the farmers under NHM for raising 17240 ha. of fruit-orchards covering 12,012 ha. of mango, 5028 ha. of cashew and 1700 ha. of banana with an expenditure of Rs.14.71 crore.

4.31 During 2006-07, the total area under fruit crops in the State was 306.64 thousand hectares, out of which mango area accounted for 140.59 thousand hectare, coconut 51.04 thousand hectare, banana 22.23 thousand hectare, citrus fruits 26.51 thousand hectare, pineapple 0.68 thousand hectare and papaya 0.80 thousand hectare. All other fruits covered 64.79 thousand hectare. Table 4.5 presents data on area, production and yield rate of different fruits crop during 2006-07.

Table - 4.5
Area, Production and Yield Rate of different Fruits in Orissa during 2006-07.

Name of the fruits	Area ('000 ha.)	Production ('000 MT)	Yield rate (qtl/ ha)
Mango	140.59	431.41	30.69
Banana	22.23	284.81	128.12
Citrus	26.51	206.02	77.71
Pine apple	0.68	7.38	108.53
Papaya	0.80	13.92	174.00
Coconut	51.04	2756 lakh nuts	540
Other fruits	64.79	481.32	74.29
Total	306.64	1424.86 & 2756 lakh nuts	55.75 & 2756 nuts per Ha.

P – Provisional

Source : Directorate of Horticulture, Orissa, Bhubaneswar.

4.32 Suitable agro-climatic conditions and growing market demand has created a lot of scope for vegetable cultivation in the State. During 2006-07 the area covered under vegetable cultivation was about 632 thousand hectare and vegetable production was about 7920 thousand MT. The yield rate of vegetable during 2006-07 stood at 125.40 qtls./hect.. The area, production and yield rate of vegetable have increased a little compared to 2005-06. The area, production and yield

rate of major vegetables is given below at Table- 4.6

Table - 4.6
Area, Production & Yield Rate of different Vegetables during 2006-07(P.)

Name of the vegetables	Area ('000 hect.)	Production ('000 M.T.)	Yield rate (qtls./hect.)
Brinjal	128.98	1913.82	148.38
Tomato	100.59	1337.47	132.96
Cabbage	33.78	933.34	276.30
C. Flower	45.12	641.64	142.21
Pea	4.84	42.15	87.09
Okra	71.48	620.86	86.86
Sweet Potato	47.16	403.87	85.64
Potato	12.84	165.03	128.53
Others	186.83	1862.26	99.68
Total	631.62	7920.44	125.40

P - Provisional

* Directorate of Economics & Statistics, Orissa, Bhubaneswar.

Source :- Directorate of Horticulture, Orissa, Bhubaneswar

FLORICULTURE

4.33 There is an increasing demand for flowers like rose, marigold, gladioli, tube-rose etc. in the State and most of the flowers are being imported from the neighbouring states like West Bengal, Andhra Pradesh. Therefore emphasis is being given to encourage farmers of the State to increase their farm income as well as to create employment opportunities through floriculture. Financial assistance up to 50% of the cost of cultivation for small and marginal farmers and 33% for other farmers, ranging from Rs.7920/- per hectare to Rs.45,000/- per hectare is being provided for commercial cultivation of flowers. Table 4.7 shows the area and production of different floricultural crops since 2003-04. It is revealed from the table that floriculture is becoming popular among farmers. During

2006-07 rose was cultivated an area of 246.25 hectare which accounts for an increase of about 120.75% over 2005-06. Similarly the Gladioli and Tube-rose cultivation also increased by 140.42% and 82.33% respectively over 2005-06. This shows the positive attitude of the farmer

towards floriculture. During 2006-07, about 26.6 thousand qtls. marigold, 0.51 thousand qtls. of rose and 311.70 lakh spike of gladioli were produced in the State. During 2007-08, it has been programmed to cover 2050 hectare under floriculture with an outlay of Rs.5.22 crore.

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		Tube rose.	
	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	26640	246.25	505.86	311.70	311.70	196.00	1960

P- Provisional

Source: - Directorate of Horticulture, Orissa, Bhubaneswar.

Spices

4.34 Ginger and Turmeric are the major spices grown in the State. Although, Orissa has a major share in production of ginger and turmeric, the varieties cultivated are mostly traditional and low yielding. Emphasis is being given for introduction of improved varieties. Assistance @ Rs.11,250/- per hectare is being provided for the purpose under National Horticulture Mission (NHM). It has been proposed to cover 2000 hectare (800 ha. ginger, 1200 turmeric) cultivation during 2007-08 with financial assistance of Rs.2.25 crore. During 2006-07, an area of 174.55 thousand ha. was brought under spices cultivation as against 171.86 thousand ha. cultivated in 2005-06 exhibiting an increase of about 1.6%. Production also increased by 4.5% over the same period.

Table 4.8 shows the area and production of different spices crops during 2006-07.

Table - 4.8
Area and Production of Spice crops in Orissa.

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

Spice	2005-06		2006-07	
	Area	Production	Area	Production
Onion	26.81	243.87	28.51	260.00
Garlic	11.04	35.43	11.04	35.51
Coriander	19.06	9.04	19.07	9.07
Chilly	75.12	63.29	75.12	63.93
Ginger	15.81	30.64	16.07	31.40
Turmeric	24.02	57.09	24.74	59.35
Total	171.86	439.36	174.55	459.26

Source: Directorate of Horticulture, Orissa.

4.35 Further it is also revealed from the Directorate of Horticulture that highest spice production in the State during 2006-07 was recorded in Phulbani district (43,416 MT) followed by Bolangir (40,628MT) and Angul (37,334 MT).

LAND REFORMS

4.36 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.

4.37 Land ceiling is imposed to acquire surplus lands by the Government and redistributed 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.

4.38 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 have been 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 144681 hectares of land have been taken up for consolidation work. Consolidation work of 7956 villages with an area of 1204015 hectare have been completed by the end of 2006-07, out of which 5 villages with 433 hectares of land have been completed during 2006-07.

CROP INSURANCE

4.39 The comprehensive Crop Insurance Scheme was introduced in the State in 1985 with an objective to provide financial support to farmers on 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.

4.40 During Kharif, 2006 about 8.90 lakh hectares of cropped land belonging to 8.80 lakh farmers were covered under the insurance scheme and the sum insured was about Rs.1071.19 crore. In Kharif 2006, no claim was made for any crop loss.

4.41 Similarly in Rabi, 2006-07 season about 2.00 lakh hectare of cropped land belonging to 2.00 lakh farmers were covered under the scheme, and claims amounting to Rs.46.02 lakh was paid to 12521 beneficiaries for loss of crops viz. paddy, ground nut, mustard, potato and sugarcane.

DRY LAND FARMING

4.42 Dry land farming is practiced under rain-fed condition over more than 60% of the cropped area of the State but 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.

4.43 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.

4.44 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

4.45 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 at the beginning of 10th Plan Period, i.e., 2002-03 was about 290.56 TMT, which has increased to 402.88 TMT by the end of 10th Plan Period, showing an increase of 38.66%. The per hectare consumption of fertilizer has increased from 39 kg. to 47 kg. during the same period.

4.46 Fertilizer consumption of 40643 MT in Baragarh district was found highest during 2006-07 followed by Balasore district (33297 MT) and Ganjam district (32046 MT) while that in Phulbani district was the lowest (1227 MT). However, the per hectare consumption of fertilizer was highest for Bhadrak district (104 kg./hectare) during 2006-07. Table 4.9 shows the fertilizer consumption in Orissa from 1961-62 to 2006-07. The per hectare fertilizer consumption in the state has increased from 39 kg. per hectare at the beginning of 10th Plan Period to 47 kg. per hectare by the end of the period 2006-07.

Table - 4.9
Fertiliser Consumption in Orissa.

Year	(000' MT)				
	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	266.54	92.77	53.57	402.88	47.00

P: Provisional

4.47 Further, it is 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.

Name of the State	(kg./hect.)				
	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
Orissa	39.00	39.00	37.10	40.40	43.00
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
All India	90.12	84.82	88.20	96.60	104.50

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.

4.48 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.

4.49 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

4.50 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.

4.51 Consumption of pesticides/ insecticides in the State shows a fluctuating trend. Consumption of pesticides in the State during 2003-04 was 1028.50 MT which decreased to 987.00 MT during 2004-05 and again it increased to 1132.50 MT in 2006-07. Per hectare consumption of pesticides in the State has increased from 138.53 gm. in 2005-06 to 148.94 gram in 2006-07.

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

AGRICULTURAL MARKETING

4.52 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.

4.53 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

4.54 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.2912.17 crore, an amount of Rs.3317.95 crore of agricultural loan have been advanced during 2006-07 showing an achievement of 113.93% which is 22.85% higher than the agricultural loan advanced during 2005-06. Out of the total agricultural loan financed during 2006-07, the share of Co-operative Banks was 47.53%. 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	Commer- cial 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

P : Provisional
Source: State Level Bankers' Committee, Bhubaneswar

FARM MECHANISATION

4.55 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 supplied to farmers and the subsidies released by APICOL during 2006-07 are indicated below.

Farm Machineries	Nos. supplied	Subsidy released (Rs. in lakh)
Tractor	630	189.00
Power Tiller	2029	575.58
Hydraulic trailer	100	20.00
Reaper	75	15.00
Others	83	16.55
Total	2917	816.13

4.56 During 2007-08, it has been proposed to subsidies 3446 power tillers, 84 paddy reapers, 2 paddy transplanters, 50 power oriented implements, 80 specialised power driven implements, 880 tractors, and other farm mechanization to the farmers with total financial provision of Rs.1406.13 lakh.

AGRO SERVICE CENTRE (ASC)

4.57 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 2006-07, 78 ASCs have been setup and subsidy amounting to Rs.142.00 lakh has been released. It has been

programmed to setup 250 ASCs during 2007-08.

SOIL CONSERVATION AND WATERSHED DEVELOPMENT

4.58 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.

4.59 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. Till the end of 8th Plan Period, a total area of

about 15 lakh hectare had been covered under various soil conservation schemes. During 9th Plan Period, another 3.22 lakh hectare was treated under various soil conservation measures. By the end of Tenth Five Year Plan, 2006-07 about 14655 Water Harvesting Structures have been completed and additional irrigation potential about 156.396 thousand hectares have been created including 2135 water harvesting structures completed during 2006-07 generating additional irrigation potential of about 34.788 thousand hectares.

WATERSHED MISSION

4.60 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 RLTA 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.*

4.61 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.

4.62 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 28568 SHGs are functioning in various watersheds with 3.54 lakh members and 56,002 user groups have been formed with 5.63 lakh user members who have contributed Rs.18.88 crore towards Watershed Development Funds.

4.63 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.3057.57 crore for treating 5.44 lakh hectares, against which Rs.130.45 lakh have been released and Rs.106.81 crore have been utilized for treating 2.01 lakh hectares. During 2006-07 about 28,100 ha. were treated by utilizing 17.03 crore.

4.64 Under the RLTP 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.77.62 crore has been utilized treating 1.13 lakh ha.

of land. This includes utilization of Rs.27.71 crore for treating of 0.34 ha. during 2006-07.

4.65 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.134.90 crore have been released by the end of March 2007, out of which Rs.115.80 crore have been utilized in treating 34471 hectares. It has been targeted to treat 35,000 hectare in 2007-08.

4.66 National Watershed Development Project for Rain-fed Areas (NWDPA) is being implemented as a component of CSP Macro Management of Agriculture. 212 recast watersheds of 9th plan period were carried over to 10th Plan for treating 138244 ha. at an estimated cost of Rs.62.11 crore. During 2006-07 an amount of Rs.31.56 crore have been utilized and 70139 ha. have been treated in 196 watershed.

4.67 River Valley Project (RVP) is in operation in four catchments viz. Hirakud, Rengali – Madira, 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. Thirteen ongoing water sheds were

being implemented during 2006-07 and an amount of Rs.2.34 crore was spent to treat 3777 ha. It is proposed to treat an area of 7776 ha. in 19 on going watersheds with an outlay of Rs.5.28 crore during 2007-08.

4.68 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 2006-07, the programme is being implemented in 290 watersheds and an amount of Rs.26.07 crore have been utilized and an area of 38,000 ha. was treated. It is proposed to continue the watersheds for treatment of 31,800 ha. at an estimated cost of Rs.30.21 crore during 2007-08.

AGRICULTURAL PROMOTION AND INVESTMENT CORPORATION LTD (APICOL)

4.69 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.

4.70 During the year 2006-07, 93 agricultural Enterprises (80 Agro Service Centres and 13 Commercial Agriculture Enterprises) have been promoted by APICOL with an investment of Rs.5.37 crore and an amount of Rs.1.12 crore incentive have been provided to 93 beneficiaries. During 2007-08 it has been proposed to setup 100 commercial Agro-Enterprises and the required subsidy will be met out of self employment programme.

TRAINING PROGRAMME

4.71 During 2006-07 an amount of Rs. 6.94 lakh have been spent towards imparting training to 120 unemployed graduates under Entrepreneurship Development Programme. During 2007-08 it is programmed to impart training to 210 unemployed graduates with an outlay of Rs.10.00 lakh.

ORISSA AGRO INDUSTRIES CORPORATION (OAIC)

4.72 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 fertilizers, pesticides, cattle and poultry feed to the farmers.

CENTRAL RICE RESEARCH INSTITUTE (CRRI)

4.73 The Central Rice Research Institute (CRRI) 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 25 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 70 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 CRRI, 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.

4.74 During 2005-06 the institute introduced six new high yielding varieties of seeds namely Ajay, Rajalaxmi, Naveen, Varshadhan, Geetanjali and Ketakijoha, 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 in 2005-06.

Year	Name of the variety	Duration (days)	Yield (t/ha.)	Remarks
2005-06	Ajay	135	7.5	Recommended for irrigated and rainfed shallow favourable low land condition
2005-06	Rajalaxmi	135	7.0	Recommended for irrigated and rainfed shallow favourable low land condition
2005-06	Naveen	120	4.5 (Kharif) 6.0(Summer)	Recommended for irrigated and rainfed shallow favourable low land condition
2005-06	Varshadhan	160	4.0	Recommended for rainfed semi-deep and deep water areas
2005-06	Geetanjali	135	5.0	Recommended for irrigated areas
2005-06	Ketakijoha	150	4.0	recommended for rainfed shallow low lands

4.75 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.

4.76 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)

4.77 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.

4.78 During 2005-06, 259 students passed degree courses on various streams viz. Agriculture, Agriculture Engineering, Fisheries, Home Science, Veterinary Science etc. Similarly, 137 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. During 2007-08, the university has made significant contributions in terms of crop improvement, crop production and crop protection.

4.79 During 2006-07, the university has produced 2.96 lakh quality planting materials of mango, guava, litchi, rose, cashew and other forest species and ornamental seedling. Besides, OUAT also produced 351 quintals Breeders, 8963.4 qtls. Foundation, 1129.2 qtls. certified paddy seeds and 684.7 qtls. non paddy seeds in 2006-07.

4.80 At present 27 Krishi Vigyan Kendras are functioning under OUAT. During 2006-07, 985 training programmes on transfer of technologies to the farmers covering 18,385 farmers including farm women and rural youth were conducted. Besides, total 1342 frontline demonstrations on different crops in an area of 818.8 ha. were conducted in 2006-07. Also 201 farmers have been enrolled in 10 courses offered by the distance education projects of the university during 2006-07. Advisory Services have been rendered to 4519 farmers through Agricultural Technology Information Centre.

AGRICULTURAL CENSUS

4.81 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 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 three agricultural census is given in table 4.15.

4.82 It is also revealed from the above 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.

4.83 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.

4.84 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 - 4.15

**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
Total	1995-96	5.46	11.78	39.66	4.89	16.29	51.44
	2000-01	5.69	12.30	40.67	5.14	16.31	50.81

Source: Agriculture Census.

