

CHAPTER 4

AGRICULTURE

4.01 Agriculture plays a dominant role in the economy of the State like Orissa. While Agriculture and Animal Husbandry contributed 25.97 percent of the Net State Domestic Product of the State in 2003-04 (Q) at 1993-94 prices, the Agriculture alone provided direct and indirect employment to around 65 percent of the total work force of the State as per the 2001 Census.

4.02 Agriculture in Orissa continues to be characterized by low productivity due to traditional agricultural practices, inadequate capital formation and low investment, inadequate irrigation facilities and uneconomic size of holdings. Nearly 62% of the cultivable land is rain fed and exposed to the vagaries of monsoon. The per-capita availability of cultivated land which was 0.39 hectare in 1950-51 has declined to 0.15 hectare in 2003-04. Out of the total no. of operational holdings of 39.66 lakh, 81.98% is held by small and marginal farmers as per Agricultural Census 1995-96. Most of these small and marginal farmers do not have the means to make adequate investment in agriculture due to poverty.

4.03 Agriculture is a complex and multi-dimensional enterprise. Its development depends on various factors like agro-climatic conditions, technology, inputs, system of land holdings and other socio-economic factors. 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 fertilisers, pest management, marketing and use of modern agricultural implements and farm machinery.

4.04 Recognising the importance of this sector to the State's economy, the State Government have come up with a comprehensive Agriculture Policy according agriculture the status of an industry. The objectives of the above policy shall be pursued vigorously during the Tenth Plan to make Agriculture sector one of the growth engines for accelerating the pace of development of 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 subsistence agriculture 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 Industries 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 enterprise.
- ix. To promote private enterprise in the 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.

PRODUCTION OF FOODGRAINS

4.05 Table 4.1 presents data on production of food grains in the State during the last five years i.e. 1999-2000 to 2003-04. Production of food grains has fluctuated over the years. During 2001-02, there was a record production of food grains of 75.40 lakh M.T., comprising a bumper production of rice of 71.49 lakh M.T. But during 2002-03, agriculture sector got a major set back due to severe drought in the State during Kharif-2002. The July rainfall was deficient by 60% which is the lowest during last 40 years. The prolonged dry spell severely affected the growth of different crops. The Rabi prospects also became bleak due to failure of rains during October and November. This caused rapid

depletion of soil moisture specially in inland districts. Due to poor storage position of reservoirs, irrigation was available for about 3 lakh hectare during Rabi season of 2002-03. All these factors had seriously affected the food grain production which declined to a very low level of 35.55 lakh MT in 2002-03 as against 75.40 lakh MT during the previous year. The situation again revived during 2003-04. The food grains production again reached the record level of 71.52 lakh M.T. and production of rice only was about 94.16% of total food grains production, i.e. 67.34 lakh M.T. Food grains production during 2003-04 has been doubled in comparison to the previous year.

4.06 Rice is the principal food crop of the State. The average yield rate of rice in Orissa which was 7.59 quintal / hect. in 2002-03 increased to 14.96 quintal / hectare during 2003-04. The per capita availability of food grains per annum which was 95 kg in 2002-03 has increased to 188 kg in 2003-04. The contribution of Orissa to the food grain basket of the country, which was 2.07% in 2002-03, is estimated at about 3.42% in 2003-2004.

Table 4.1

Foodgrain Production in Orissa

(in lakh MT)

Sl. No.	Food Crop	1999-00	2000-01	2001-02	2002-03	2003-04(P)
1	2	3	4	5	6	7
1	Rice	51.87	46.13	71.49	32.44	67.34
2	Total cereals	53.58	47.67	72.81	33.50	68.86
3	Total pulses	2.44	2.08	2.59	2.05	2.66
Total foodgrains (Sl, 2 +3)		56.02	49.75	75.40	35.55	71.52

R : Revised Estimate P : Provisional Estimate

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

Directorate of Agriculture and Food Production, Orissa, Bhubaneswar.

RICE

4.07 “The Integrated Cereal Development Programme-Rice” is being implemented in the State since 1994-95, with the objective of augmenting paddy production

and enhancing productivity of rice through adoption of a package of scientific practices. A major component of this programme is to increase coverage of area under High Yielding Variety (HYV) seeds. Despite inadequate irrigation facilities, shortage of HYV seeds, low use of fertilizers and pesticides, there has been significant expansion of area under HYV crops in the State. Area under HYV paddy has increased by 12.13% during the period from 1999-00 to 2003-04. The total area under HYV paddy both irrigated and un-irrigated during 2003-04 was 2888.36 thousand hectares which is presented in table 4.2. The Agriculture Policy, 1996 accords priority to multiplication of high yielding variety of seeds to replace the traditional varieties being used in the State. Seed multiplication is organised through departmental agricultural farms, Orissa State Seeds Corporation, Seed Village Programme and private registered seed growers. Certified seeds are supplied to farmers through 628 departmental sale centers located in all the 314 blocks of the State. During 2003-04, 18 additional seed sale centers were opened in the KBK blocks under RLAP. During 2002-03, 2.09 lakh quintals of seeds of different varieties of crops were sold to the farmers where as during kharif 2004 the quantity of seed sold is 1.10 lakh quintals. During 2003-04, 13162 hectare of area were registered with Orissa State Seed Certification Agency (OSSCA) for production of certificate seeds and 1,76,781 quintals of seeds of various kinds were certified by the Agency.

Table 4.2
Area under HYV Paddy in Orissa

(In thousand hectare)

Sl. No.	Year	Autumn		Winter		Summer		Total	
		Irrigated	Un-irrigated	Irrigated	Un-irrigated	Irrigated	Un-irrigated	Irrigated	Un-irrigated
1	2	3	4	5	6	7	8	9	10
1	1999-00	22.85	310.61	811.98	1048.64	381.81	-	1216.64	1359.25
2	2000-01	32.03	367.48	866.08	1155.97	206.74	-	1104.85	1523.45
3	2001-02	30.00	395.00	852.00	1301.00	272.00	-	1154.00	1696.00
4	2002-03	20.99	382.66	859.63	1225.75	177.55	-	1058.17	1608.41
5	2003-04	15.22	434.64	839.09	1345.94	253.47	-	1107.78	1780.58

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

PULSES

4.08 The total area under pulses accounted for about 13.28% (7.16 lakh hectare) of the area under food grains (53.89 lakh hectare) and contributed about 3.72% (2.66 lakh MT) of total food grain production (71.52 lakh MT), of the State during 2003-04. In

order to increase production of pulses, it is proposed to increase the coverage of area under pulses and to raise productivity through the adoption of dry farming technology, adoption of mixed and inter-cropping system, use of quality seeds, use of phosphoric fertilisers, and adoption of need based plant protection measures. National Pulse Development Programme is being implemented in the State since 1994-95 with the objective of increasing the production and productivity of pulses in the State. Assistance is provided for breeder seeds, foundation seeds, seed village programme, certified seeds, block demonstration etc.

OIL SEEDS

4.09 Groundnut, sesamum, mustard and niger are the main oil seed crops grown in the State. Sun-flower cultivation has also been introduced in Western Orissa. For improving oil seeds production in the State, emphasis is laid on production of certified seeds, supply of input kits, subsidized sale of quality seeds, plant protection chemicals, plant protection equipments, and farm implements under the Centrally Sponsored Plan scheme “Oil Seeds Production Programme” (OPP). The coverage under oil seeds in 2003-04 was 3.08 lakh hectare with production level of 1.59 lakh MT as against coverage of 2.68 lakh hectare and production level of 1.15 lakh MT during 2002-03. Out of the total area under oilseed crops during 2003-04, Groundnut was cultivated in 25% of this area followed by till in 12%. 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 in to a single scheme christened ISOPOM (Integrated Schemes of Oilseeds, Pulses, Oil palm and Maize) with a total outlay of Rs.750.30 lakh. During 2004-05, it is targeted to produce 6.42 lakh M.T. of Oilseeds.

COMMERCIAL CROPS

4.10 In the overall strategy for agricultural development in the State, commercial crops like sugarcane, jute, mesta, cotton, soyabean, groundnut, potato, chilly, onion etc. are being given more thrust. Paddy and other food grains are being encouraged only in land which is suitable for their cultivation. In low rain fed areas of Kalahandi, Koraput, Bolangir, Nowrangpur and Rayagada, cotton cultivation has been encouraged. The

production of cotton increased from 0.47 lakh bales in 2002-03 to 0.84 lakh bales during 2003-04. It is targeted to produce 1.60 lakh bales of cotton during 2004-05. In the coastal districts, river bed potato cultivation is being promoted by using certified potato seeds and other improved planting materials. Sugarcane cultivation has been accepted by farmers in the State because it is a high value commercial crop. Steps are being taken to cover at least 1.5 lakh hectares 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 7.53 lakh M.T. during 2002-03 to 8.58 lakh M.T. during 2003-04. It is programmed to increase the production of Gur to 2.55 lakh M.T. during 2004-05.

CROPPING PATTERN

4.11 More than 70% 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 1999-00 to 2003-04.

Table 4.3
Cropping Pattern of Principal Crops in Orissa.

(Figures in percentage)

Sl. No.	Principal crop	1999-00	2000-01	2001-02	2002-03	2003-04(P)
1	2	3	4	5	6	7
1.	Paddy	76.4	77.5	76.2	77.7	76.4
2.	All cereals	79.8	81.1	79.5	80.8	79.3
3.	Total pulses	10.9	9.7	11.4	10.9	12.2
	Total food grains	90.7	90.8	90.9	91.7	91.5

4.	Oil seeds	5.6	5.9	5.5	4.9	5.2
5.	Fibers	1.4	1.4	1.8	1.3	1.3
6.	Other crops (sugarcane, potato, tobacco, chilly and ginger)	2.3	1.9	1.8	2.1	2.0
All crops		100	100	100	100	100
Total Area (thousand hectare)		6020	5720	5907	5499	5891

P : Provisional Estimate , R : Revised Estimate

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

4.12 Table 4.3 shows that during 2003-04 paddy was the major cereal crop in the State with coverage of about 76.4% of the total gross cropped area under principal crops, followed by pulses (12.2%), and oilseeds (5.2%). The area under fiber crops accounted for only 1.3% and other cash crops, which include sugarcane, potato, chilly, ginger and tobacco etc. constituted only 2.0% of the total gross cropped area under principal crops. The percentage of area under pulses & food grains has increased in 2003-04 over 1999-00 while that of cereals, oilseeds, fibers has declined. Efforts are being made for diversion of paddy area to non-paddy area.

CROPPING INTENSITY

4.13 Cropping intensity is one of the indices of the level of agricultural development. Table 4.4 shows that cropping intensity declined from 151% during 2001-02, to 138% during 2002-03. However it again increased to 149% in 2003-04.

Table 4.4.
Cropping Intensity for the Period from 1998-99 to 2002-03

(Area in thousand hectare)

Sl. No.	Year	Net area sown	Gross cropped area	Cropping intensity (%)
1	2	3	4	5
1	1999-00	6075	8524	140
2	2000-01	5829	7878	135
3	2001-02	5845	8798	151
4	2002-03	5680	7853	138
5	2003-04(P)	5796	8637	149

Source : Directorate of Agriculture and Food Production, Orissa.

HORTICULTURE

4.14 Orissa has vast potential for development of horticulture. Different agro-climatic zones have been identified in the State for development of specific fruits, vegetables and spices. Hill tracts of KBK districts and of Kandhamal and Gajapati districts are suitable for intensive horticultural activities. 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. The Tenth Plan proposals have been formulated for promoting integrated development of horticulture through area expansion of fruit crops, vegetables, spices, root and tuber crops and floriculture. Emphasis has also been given for dissemination of technology by way of massive training programmes, incentives for production of quality foundation and certified vegetable cultivation. Effort of macro management is further supplemented in pro-active agriculture policy of the State by providing opportunities to entrepreneurs to choose horticulture as a profession and a means of sustainable income generation.

4.15 Out of the total area of 275.13 thousand hectare under fruit crops in the State during 2003-04, mango orchards accounted for 115.11 thousand hectare, coconut 50.44 thousand hectare, banana 20.13 thousand hectare, citrus fruits 25.92 thousand hectare, pineapple 0.98 thousand hectare and papaya 0.73 thousand hectare. All other fruits covered 61.82 thousand hectare. Table 4.5 presents data on area, production and yield rate of different fruits during 2003-04.

Table 4.5

Area, Production and Yield Rate of different Fruits in Orissa during 2003-04

Sl. No.	Name of the fruits	Area ('000 hect.)	Production ('000 MT)	Yield rate (qtl/ hect)
1	2	3	4	5
1	Mango	115.11	405.17	35.20
2	Banana	20.13	240.36	119.40
3	Citrus	25.92	194.36	74.98
4	Pine apple	0.98	10.79	110.10
5	Papaya	0.73	13.92	19.09
6	Coconut	50.44	2434 (nuts)	4826 (nuts)

7	Other fruits	61.82	400.69	64.82
Total		224.69 +50.44 (nuts Area)	1265.29 and 2434 (lakh nuts)	56.31 and 4826 no.of (nuts)

Source : Directorate of Horticulture, Orissa, Bhubaneswar.

4.16 The total area and production of vegetables during 2003-04 was 623.14 thousand hect. and 7701.96 thousand M.T. respectively as against 621.98 thousand hect. and 7604.36 thousand M.T. during the previous year. Table 4.6 presents data on area, production and yield rate of different vegetables during 2003-04.

Table 4.6

Area, Production and Yield Rate of different Vegetables during 2003-04

Sl. No.	Name of the vegetables	Area ('000 hect.)	Production ('000 M.T.)	Yield rate (qtls./hect.)
1	2	3	4	5
1	Brinjal	127.58	1850.00	145.01
2	Tomato	100.17	1329.95	132.77
3	Cabbage	33.50	925.13	276.16
4	C. Flower	44.93	636.65	141.70
5	Pea	4.75	41.44	87.24
6	Okra	71.37	619.40	86.79
7	Sweet Potato	47.03	393.56	83.68
8	Potato*	7.30	75.82	103.86
9	Others	186.51	1830.01	98.12
Total		623.14	7701.96	123.60

* Directorate of Economics & Statistics, Orissa, Bhubaneswar.

Source :- Directorate of Horticulture, Orissa, Bhubaneswar

FLORICULTURE

4.17 Floriculture has been given due thrust. During 2002-03, 852 units of demonstration of rose, marigold, crossandra, gladioli and jasmine have been conducted and further 175 demonstration of Tuberose are being take-up. During 2003-04, 4,100 units of demonstration were taken covering an area of 267 hect. with Tuberose, Gladiolis, Rose and Marigold. Similarly, during 2004-05 there is a programme to conduct 6,000 demonstrations with a financial outlay of Rs.134.00 lakh under work plan. In KBK district 300 no. of demonstration will be conducted with a financial outlay of Rs.7.00 lakh.

Table 4.7

Area and Production of different Floricultural Crops for the year 2003-04.

(Area in ha./ Prod'n. in Qtl.)

Year	Marigold		Rose		Gladioli		Tube rose.	
	Area	Production	Area	Production	Area	Production	Area	Production
1	2	3	4	5	6	7	8	9
2003-04	194.64	14581	41.62	92.19	11.366	1136800	33.62	540

Source:- Directorate of Horticulture, Orissa, Bhubaneswar.

4.18 Production of quality planting material is essential for expansion of area under horticultural crops. For this purpose, development of departmental orchards and nurseries for production of quality planting materials has been extended to 15 lakh numbers. During Tenth Plan, a provision of Rs.318.33 lakh has been made for production of quality planting materials of different fruit crops in the departmental farms. The scheme also envisages maintenance of 98 departmental orchards covering 1,020.52 hectares of fruit plants. During 2003-04, under Kalpabrikshya Yojana 40,000 nos. of families have been supplied with 2-lakh numbers of fruits saplings free of cost. An additional 2520 nos. of BPL families will be covered during 2004-05 under this programme with an outlay of Rs.0.50 lakh. During 2004-05, there is a programme to cover 5095 hectares under compact area plantation of different fruits with a financial involent of Rs.81.64 lakh under the Work plan. Under RLTA for KBK, 1230 hect. is programmed to be covered with an outlay of Rs.42.68 lakh. During 2004-05, there is a programme to cover 1025 hectares, under Banana cultivation with a financial outlay of Rs.76.25 lakh and 10 hectares under pineapple with a financial outlay of Rs.12.50 lakh in KBK districts. During 2003-04, to popularize seasonal and off season cultivation in KBK, seed minikits comprising of five different vegetables in their backyards,. 60,000 such vegetable minikits costing Rs.75/- each have been supplied to the beneficiaries (at a nominal cost of Rs.10/-) implying a subsidy of Rs.65/- with total subsidy cost of Rs.45.00 lakh. This programme will continue during 2004-05 in KBK district for distribution of 50,000 no. of vegetable minikits with a financial outlay of Rs.37.50 lakh. The low cost onion storage structure were introduced in 2002-03 to facilitate the onion growers to storage their produce. During 2003-04, 250 such structures were constructed with an expenditure of Rs.10 lakh. During 2003-04, 1582 demonstrations have been conducted in the Farmers Field by supplying quality planting materials of ginger and turmeric with an expenditure of Rs.25.29 lakhs. For transferring the production technology of different flowers to the farmers, 1200 farmers have been trained on package of practices of floricultural crops, 150 farmers were sent outside the state on exposure visit to learn the advanced technology. During 2004-05 it is programmed to train additional 1200 farmers on package of practices of floriculture crops.

4.19 The State Government have signed an agreement with the APEDA (Agricultural & Processed food products Export Development Authority) in January,2003 for setting up an Agri. Export Zone (AEZ) on ginger and turmeric for contiguous districts of Kandhamal and Koraput for the purpose of export promotion of these commodities. Under Cashew Development Programme, 3341 hectares have been covered during 2003-04 under new plantation by distributing 4,68,165 nos. of grafts to the beneficiaries. During 2004-05, there is a proposal to cover 3325 ha. under cashew plantation with a financial provision of Rs.224.91 lakh.

LAND REFORMS

4.20 Land reforms continues to be an integral part of the overall strategy of poverty alleviation. Land reform measures include abolition of intermediary rights, tenancy reforms that includes 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.

4.21 The basic objective of land ceiling laws is to acquire ceiling surplus land and to distribute it among land less persons. By the end of 2003-04, 1,63,658.351 acres of ceiling surplus land has been distributed among 1,46,450 landless persons as against 1,63,512.860 acres distributed to 1,46,034 persons by the end of the previous year.

4.22 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 ensuring better land management and optimum utilisation of limited water resources. Since inception, 10039 villages have been brought under the fold of consolidation operation of which 760 villages were exempted by the issue of notification u/s 5 (i) of the O.C.H & P.F.L. Act, 1972 due to unsuitability for consolidation and balance 9,279 villages have been taken up for consolidation work. Out of these 9,279 villages, only in 7,845 villages consolidation operation covering an area of 11,96,437 hectares of land was completed by the end of financial year 2002-03. During 2003-04, consolidation operation in another 84 villages, covering an area of 2592 hectares have been completed.

CROP INSURANCE

4.23 In order to provide financial support to cultivators in the event of crop failure on account of natural calamities, a Comprehensive Crop Insurance Scheme (CCIS) was launched in the State during 1985. The scheme was voluntary in nature and covered all farmers availing crop loans from Co-operative Banks, Commercial Banks and Regional Rural Banks. A modified and more liberal scheme formulated by Government of India in the name of National Agricultural Insurance Scheme (NAIS) has been implemented since Rabi season of 1999-00. The State Agriculture Policy, 1996 envisages extension of insurance cover to crops like sugarcane, cotton, jute, biri, mung, arhar, gram, peas, sunflower soyabeans, til, niger and maize etc.

4.24 During Kharif-2002, crops like paddy, groundnut, maize, niger, red gram, cotton were covered under National Agricultural Insurance Scheme and an amount of Rs.244.03 crore was paid to 8,39,345 farmers for the loss of crops over an area of 13.78 lakh hectare. Similarly, an amount of Rs.59.53 lakh was paid to 6696 farmers for the loss of crops like paddy, groundnut, mustard, potato, sugarcane covered under insurance over an area of 1.23 lakh hectare during Rabi season of 2002-03. During Kharif-2003, crops like paddy, groundnut, maize, redgram, cotton, potato and sugarcane were covered under insurance over an area of 6.34 lakh hectare and benefited 38188 number of farmers. The amount of subsidy given during Rabi-2003 is amounting Rs.57.58 lakhs and premium collected is Rs.279.21 lakh.

DRY LAND FARMING

4.25 Nearly 62% of the cultivable land in the State is rain fed and depends on monsoon. The farmers in the State grow paddy widely in all situations despite the risk of moisture stress and low yield. In respect of upland paddy, it has been observed that only early varieties (with duration of 90 days or less) has a reasonable chance of success. In drought situation, even early varieties suffer a setback. Under such situations, other upland crops like ragi, gram, biri, groundnut etc. can give a more stable yield with smaller fluctuations. 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 commendable 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.

4.26 Dry-land farming technology, however, has to be location specific depending on the type of soil, rainfall pattern and agrarian practices. Sustainability in crop production can be achieved through appropriate soil and water management, run-off water collection and recycling, provision of farm ponds, percolation tanks, adoption of improved agronomic practices, crop substitution, inter-cropping, mixed cropping, use of fertilizers at optimum levels, use of improved implements, and need based pest control measures.

4.27 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

4.28 Application of chemical fertilizers and organic manure plays a vital role in increasing productivity. It also protects land fertility by meeting the nutrient requirement of crops. Consumption of chemical fertilizers in the State has increased from 35.51 kg per hectare in 1998-99 to 39.00 kg per hectare in 2003-04. During 2003-04, the total fertiliser consumption in the State was 326.17 thousand MT as against 290.56 thousand MT during 2002-03. In order to boost agricultural production, the Agriculture Policy, 1996 emphasizes increased use of chemical fertilizers and organic manure. The fertilizer consumption is proposed to be increased to 74 kg per hectare by 2006-07.

4.29 Continuous use of chemical fertilizers with gradual decline in application of organic manure such as farmyard manure and compost, affects the nutrient status and physical and chemical properties of the soil. Besides, injudicious use of chemical fertilizers can also pollute the environment, particularly water. Bio-fertilizers has become an important tool for sustained agricultural production which reduces dependence on chemical fertilizers and thus reduces cost of cultivation. Government encourages production and use of Green Manure, Azolla, Blue Green Algae etc. For encouraging use of green manure, incentives @ Rs.200/- per quintal were provided to the farmers on 970 quintal of seeds of Dhanicha (green manure) at an expenditure of Rs.1.94 lakh. It is proposed that during 2004-05, 1100 quintal of green manure seeds will be distributed with the financial provision of Rs.2.20 lakh.

4.30 Table 4.8 presents data relating to per hectare consumption of fertilizer for major States in the country from 1998-99 to 2002-03. The per hectare consumption of

fertilizer in Orissa at 39.00 kg in 2002-03 was much below the national average of 84.82 kg. and lower than the consumption in all the major States except Madhya Pradesh and Rajasthan. The per hectare consumption of fertilizer was highest in Punjab (174.99 kg) and lowest in Rajasthan (28.54kg) during 2002-03. The per hectare fertilizer consumption in Orissa has however increased substantially by 9.83% during the period 1998-99 to 2002-03 as against the corresponding decline of 2.60% at All India Level.

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

Table 4.8
Consumption of Fertilizer in Selected States

(kg / hectare)

Sl. No.	Name of the State	1998-99	1999-00	2000-01	2001-02	2002-03 (P)
1	2	3	4	5	6	7
1.	Andhra Pradesh	147.37	155.50	159.84	143.47	128.44
2.	Assam	18.93	27.94	35.68	38.81	42.73
3.	Bihar	81.95	85.22	97.48	87.39	87.15
4.	Gujarat	95.28	90.23	70.14	85.52	77.76
5.	Haryana	132.66	142.69	147.20	155.69	152.79
6.	Karnataka	93.31	103.30	109.52	101.48	90.91
7.	Kerala	62.32	72.46	59.38	60.72	68.17
8.	Madhya Pradesh	48.15	46.21	38.85	39.96	36.44
9.	Maharashtra	74.99	87.13	74.35	78.24	73.80
10.	Orissa *	35.51	42.28	40.52	39.00	39.00
11.	Punjab	169.43	184.22	166.69	173.38	174.99
12.	Tamil Nadu	143.49	158.74	145.31	141.55	114.00
13.	Uttar Pradesh	110.24	117.16	111.31	130.44	126.51
14.	West Bengal	103.78	129.04	113.68	126.82	122.23
15.	Rajasthan	33.98	42.37	31.06	38.88	28.54
	All India	87.08	93.81	86.34	90.12	84.82

P : Provisional

* Figures of Directorate of Agricultural and Food production, Orissa, Bhubaneswar.

Source : 1) Centre for Monitoring Indian Economy (CMIE), December, 2002.

2) Agricultural Statistics at a glance, 2003, Government of India.

PEST CONTROL

4.32 As high yielding varieties of crops are susceptible to pests and diseases, plant protection measures are essential for sustaining agricultural production. However, excessive use of pesticides may be hazardous to human health. As a result, Integrated Pest Management (IPM) will be one of the thrust areas during the Tenth Plan period in order to achieve effective pest control on 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. During 2003-04, 1028.50 MT of pesticides / insecticides were consumed in the State whereas it was 682.30 M.T. during the previous year.

AGRICULTURAL MARKETING

4.33 The Orissa State Marketing Federation has been functioning as the apex organisation under two-tier structure with 51 Regional Co-operative Marketing Societies (RCMS) and 15 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 383 Large size Agricultural and Multipurpose Societies (LAMPS) which provide a package of services at a single contact point. One Jute Marketing Co-operative Society, 2 Coconut Growers' Marketing Co-operative Societies, 17 Cashew-nut Marketing Co-operative Societies, 2 Betel Marketing Co-operative Societies, 4 Forest Marketing Co-operative Societies, 26 Fruit and Vegetable Co-operative Societies, 17 Cotton Growers Co-operative Societies, 2 Sabaigrass Co-operative Societies and one Onion Co-operative Society are functioning for assisting the growers in marketing their products.

4.34 As a result of lack of marketing facilities in many parts of the State distress sales of farm products are very common. This works as disincentive to sustain 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 Bazars" under the work plan has been emphasized and this aims at creating primary rural markets, extension and training of farmers, awareness campaigns.

AGRICULTURAL CREDIT

4.35 The total amount of agricultural loans advanced by different Commercial Banks, RRBs, Co-operative Banks and OSFC during 2003-04 was to the tune of Rs.1326.88 crore as compared to Rs.1046.55 crore in 2002-03. Out of the total agricultural loan financed during 2003-04, the share of Co-operative Banks was (54.57%) followed by Commercial Banks (32.78%) , RRBs (12.63%) and OSFC (0.02%). The investment made by different financing agencies in the agricultural sector in 2003-04 has increased by 26.75% over the previous year. The amount of loans financed by Co-operative banks, Regional Rural Banks and Commercial Banks has increased substantially by 18.89%, 7.54% and 54.55% respectively in 2003-04 in comparison to the previous year.

Table 4.9
Agricultural Credit Advanced in Orissa from 1999-00 to 2003-04

(Rs. in crore)

Sl. No.	Year	Commercial Banks	RRBs	Co-operative Banks	OSFC	Total
1	2	3	4	5	6	7
1	1999-00	197.30	95.14	467.48	-	759.92
2	2000-01	206.23	134.42	442.38	0.18	783.21
3	2001-02	266.40	129.80	532.25	0.54	928.99
4	2002-03	281.40	155.89	609.00	0.26	1046.55
5	2003-04(P)	434.89	167.65	724.03	0.31	1326.88

P : Provisional

Source : State Level Bankers' Committee, Bhubaneswar

FARM MECHANISATION

4.36 Consorted efforts have been made for popularization of large-scale use of tractors / power tillers / paddy reapers etc. under the different schemes being implemented. During 2002-03 emphasis has also been given on demonstration of specialized power driven farm implements to the farmers like self propelled paddy transplanter, tractor operated rotavator, power pulse thresher, maize Sheller, sugarcane ridger / cutter / planter etc. During 2003-04, 1493 power tillers, 521 tractors, 75 self propelled reapers, 7 self propelled paddy transplanters, 24 tractor drawn rotavator, 39 axial flow thresher and 101 thresher-cum-winnower have been supplied to the farmers at subsidised rates. During 2004-05, it has been proposed to subsidise 1200 powertillers, 75 paddy

reapers, 13 paddy transplanters, 200 power operated implements, 50 specialised power driven implements, 370 tractors, 37 rotavators with a financial provision of Rs.527.30 lakh.

4.37 To promote farm mechanization in KBK districts, 215 Power Tillers will be subsidized under the RLTA. It is also programmed to 2000 sets of manual and bullock drawn implements with a financial outlay of Rs.30.00 lakh. The corporation has completed the establishment of all the 500 Agro Service Centres Sanctioned under the World Bank assisted "Cyclone Restoration Programme". During 2004-05, it has been proposed to establish 250 Agro Service Centres including 20 under RLTA in KBK Districts.

TRANSFER OF TECHNOLOGY

4.38 Exposure visits of farmers within the State and outside of the State for specific crops has proved to be a good tool for transfer of technology. During the year 2003-04, 1000 farmers were sent outside the State and 1260 farmers were sent inside the State for exposure visits to facilitate such cross learning with a financial involvement of Rs.38.45 lakh. During 2004-05, it is proposed to send 800 farmers to outside the State and 800 farmers inside the state for exposure visits. And 800 farmers within the State with a financial outlay of Rs.30.00 lakh.

SOIL CONSERVATION

4.39 Watershed Development and Management of natural resources like soil and water couple with crop substitution and mixed cropping practices and income generating activities to raise economic standards of the rural poor constitute the core of present day development strategy. Soil Conservation activities are taken up on water-shed basis. An 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 sectors 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 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.

4.40 The total degraded land in the State is 61.21 lakh hectare 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 has been treated under various soil conservation measures. During 2003-04, Rs.249.78 lakh were utilized and an area of 2945 ha. was treated. It is proposed to cover 30,000 ha. area with Rs.2524.00 lakh during 2004-05 under the ongoing 134 watersheds and 60 new water sheds.

WATERSHED MISSION

4.41 The State Government have established a Watershed Mission during 2000-01 with a view to ensuring soil and water conservation through effective coordination between various watershed development programmes being implemented in the State by way of adequate monitoring and supervision. A perspective plan for watershed development in the State has been prepared for 10 years. 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.

4.42 The soil and water conservation activities include construction of water harvesting structures, check dams, nalla bunding, 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.

4.43 The Orissa Watershed Development Mission (OWDM) had been restructured during 2003-04 to function as a State level umbrella. The watershed programme

were implemented through various Government agencies that acted as PIAs (Project Implementing Agency) previously. Under the RLTAAP for KBK, Additional Central Assistance is made available for implementation of 314 Micro Watershed Projects taken up during 2002-03, with an expenditure of Rs.100.57 crores and covering an area of 1.67 lakh hectare. During 2003-04, Rs.1667.45 lakh was utilized for treating 26,773 hectare area. During 2004-05, treatment of the ongoing 314 watersheds will be continued for treating 30000 hectares with a budget outlay of Rs.18.00 crore.

4.44 Drought Prone Area Programme (DPAP) is in operation in 8 districts of Orissa covering 47 identified Blocks. Under the Drought Prone Area Programme (DPAP), 800 Micro Watershed Projects are under implementation and 30 number of projects have been completed in Bolangir and Sonepur districts. The total outlay for all the 830 sanctioned projects is Rs.23483.86 lakh for treatment of 4.23 lakh hectares against which Rs.4641.02 lakh have been released from Government of India share and Rs.2221.27 lakh as Government of Orissa share till March'2004.

AGRICULTURAL PROMOTION AND INVESTMENT CORPORATION LTD (APICOL)

4.45 APICOL was established in 1996 as a wholly owned Government Corporation with the objective of strengthening the rural economy by providing financial support for promotion and development of agro based and food processing industries including commercial agriculture and horticulture activities. During 2003-04, APICOL has promoted one agro and food processing unit with an expenditure of Rs.27.96 lakh. The Corporation also acts as an agent for implementing various incentive schemes provided by Government. During 2003-04, it has released Rs.9.17 lakh as subsidy in favour of 7units. APICOL also organises training programmes, seminars, workshops, and awareness programmes.

CENTRAL RICE RESEARCH INSTITUTE (CRRI)

4.46 The Central Rice Research Institute (CRRI) was established in the year 1946 at Cuttack with 60 hectare of land provided by the Government of Orissa. Till now, 63 high yielding varieties of rice have been developed for different types of land under different maturity groups by this Institute and released for cultivation by Central Variety Release Committee (CVRC) as well as State Variety Release Committee (SVRC). Besides, many varieties developed by this Institute were 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 developed by this institute. Rice-fish farming system technology has been developed by CRRRI, 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 also it can generate employment round the year. Submergence tolerance local varieties viz. Khuda, Khadara, Kusum, Gangasevli and Kalaputia have been identified and were found to be on par with the well known submergence tolerant variety FR13A. This institute has also played a major role in “transfer of technology” from laboratory to farmers field through its Krishi Vigyan Kendras (KVKs), Institute Village Linkage Programme (IVLP), Farming System Research Education (FSRE) etc. CRRRI is working on developing varieties resistant to insect-pests and diseases through application of biotechnological tools. The bacterial resistant genes have been pyramided in high yielding IR-64 and Swarna. The new line, thus, developed IR64GP22, IR64GP39 and IR64GP44 are resistant to many patho-types of Bacterial Leaf Blight and gives super yield also. Recently, CRRRI has identified two promising hybrids, i.e., CRHR 5 and CRHR 7. These two hybrids are medium duration and suitable for irrigated and favourable rain fed low land situation and under testing stage. The methane emission study revealed that application of potassium reduces methane emission from rice fields. Different varieties differ in the volume of methane emission also.

ORISSA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY (OUAT)

4.47 The OUAT has grown into a full-fledged Institution having 7 constituent colleges imparting education and training in various aspects of Agriculture, Animal Husbandry and Veterinary 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 fairs and various Mass Communication programmes. The University has strengthened its research base by establishing eight zonal research stations, 4 Zonal sub-stations, 10 commodity research stations and 13 adaptive research stations spread all over that state, along-with 46 All India Coordinated Research Projects and 41 National Agricultural Technology Projects currently operating in the University. There are 12 Krishi Vigyan Kendras operating in the University with 100%

assistance from ICAR for transfer of technology to the farmers field. During 2002-03, a new Rice variety “Jagabandhu”, Toria Variety “Anuradha”, while seeded sesamum (Til)- “Nirmala” black seeded sesamum “Prachi”, a new culture of Mung bean “Mutant of Dhauri”, and a new chili variety “Utkal Ara” have been released for Orissa by OUAT. The University has released 88 high yielding crop varieties including 46 rice varieties suitable for different agro ecological situations of the state. The three OUAT released rice varieties Viz, Lalat, Parijat and Khandagiri cover about two-third of 2.5 lakh hectare summer rice area of the state registering 300 kg/ha. additional yield thereby accruing the financial benefit of about Rs.2700 lakh annually during the summer season only. Research and extension activities of the University on mushroom have achieved success in the establishment of 53 spawn production units and boosting up of mushroom production significantly ensuring employment of more than 7,000 people. Presently about 10 tonnes/day of mushroom is available in the state. Introduction of Italian bee has brought out improvement in honey production in the state. Now Orissa produces 169 metric tones honey annually.

AGRICULTURAL CENSUS

4.48 The Agricultural Census 1995-96 shows that there were 39.66 lakh operational holdings in the State in comparison to 38.84 lakh as per the 1990-91 census registering an increase of 2.11% over a period of five years. The total area of the operational holdings which was 52.08 lakh hectare in 1990-91 has marginally declined to 51.44 lakh hectare in 1995-96. The average size of holdings which was 1.34 hectare in 1990-91 has decreased to 1.30 hectare in 1995-96. The distribution of number of operational holdings into different size classes and the area in each class is presented in Table 4.10.

Table 4.10

Number and Area of Operational Holdings in Orissa

Sl. No.	Holding size	No of operational holdings (in thousand)	Area of operation (thousand hectare)
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		1990-91	1995-96	% varia- tion	1990-91	1995-96	% varia- tion
1	2	3	4	5	6	7	8
1.	Marginal (below 1.0 hect)	2081 (53.58)	2145 (54.08)	3.08	1027 (19.72)	1064 (20.68)	3.60
2.	Small (1.0 hect to 2.0 hect)	1021 (26.29)	1106 (27.89)	8.33	1406 (27.00)	1522 (29.59)	8.25
3.	Semi-medium (2.0 hect to 4.0 hect)	585 (15.06)	544 (13.72)	(-) 1.88	1539 (29.55)	1451 (28.21)	(-) 5.72
4.	Medium (4.0 hect to 10.0 hect)	182 (4.68)	156 (3.93)	(-) 14.29	994 (19.09)	864 (16.80)	(-)13.08
5.	Large (10.0 hect and above)	15 (0.39)	15 (0.38)	0.00	242 (4.64)	243 (4.72)	0.41
Total		3884 (100.00)	3966 (100.00)	2.11	5208 (100.00)	5144 (100.00)	(-) 1.23

N.B. : Figures in brackets indicate percentage to total.

Source : Board of Revenue, Agricultural Census Division, Cuttack.

4.49 There were 5.46 lakh SC and 11.78 lakh ST operational holdings in the State with 4.89 lakh and 16.29 lakh hectares of total area respectively in 1995-96. Table 4.11 shows that the SC farmers had a share of 13.77% in the total number of holdings while their share in the total area constituted only 9.51%. Similarly the number of holdings of ST farmers formed 29.70% to the total number of holdings and their share in the total operational area was 31.67%. Data on distribution of operational holdings among all social groups are presented in Table 4.11.

Table 4.11

***Distribution of Holdings among different Social Groups
as per 1995-96 Agricultural Census***

Sl. No.	Holding size	No. of operational holdings (in thousand)	Area of operation (thousand hectare)
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		SC	ST	All groups	SC	ST	All groups
1	2	3	4	5	6	7	8
1	Marginal	373 (17.39)	587 (27.37)	2145 (100.00)	166 (15.60)	309 (29.04)	1064 (100.00)
2	Small	122 (11.03)	354 (32.01)	1106 (100.00)	165 (10.84)	488 (32.06)	1522 (100.00)
3	Semi- medium	43 (0.55)	181 (33.27)	544 (100.00)	113 (7.79)	485 (33.43)	1451 (100.00)
4	Medium	7 (4.62)	51 (32.69)	156 (100.00)	39 (4.51)	281 (32.52)	864 (100.00)
5	Large	1 (2.40)	5 (33.33)	15 (100.00)	6 (2.47)	66 (27.16)	243 (100.00)
Total		546 (13.77)	1178 (29.70)	3966 (100.00)	489 (9.51)	1629 (31.67)	5144 (100.00)

N.B. : Figures in brackets indicate percentage.

Source : Board of Revenue, Agricultural Census Division, Cuttack.

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