

CHAPTER 4

AGRICULTURE

4.01 Agriculture is the mainstay of State's economy and sustenance of the life of the people. It is a way of life of majority of Orissa's people. Agriculture and Animal Husbandry contributed 25.75 % of the Net Domestic Product of the state in 2004-05 at 1993-94 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 0.15 ha. In 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 and 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 during the planning process for accelerating the pace of agricultural development, by increasing both production and productivity, by taking steps to remove regional imbalances in cropping pattern and agricultural practices, to evolve new

variety of seeds, to expand irrigation facilities, to extend the supply of institutional credit and also a price support to farmers which shall place this dominant sector on a sound and safe footing.

4.03 Improvement in production and productivity needs to be effected to meet the increasing demand of the growing population, step up income of farmers and 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 fertilisers, pest management, marketing and use of modern agricultural implements and farm machinery.

4.04 Considering the importance of this sector, the State Government have come up with a comprehensive Agriculture Policy according agriculture the status of an industry. The objectives

CHAPTER 4

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 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 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.

ECONOMIC SURVEY

AGRICULTURE

- 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 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 The picture of production of food-grains in the State during the last five years, i.e., 2000-01 to 2004-05 is reflected in Table 4.1. 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 during Kharif-2002 due to which food grains production declined to a very low level of 35.55 lakh M.T. The situation again revived during 2003-04. The food grains production again reached a high 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.

During 2004-05 the production of food-grains again declined by 2.61% and that of rice by 2.93% over 2003-04 due to excessive rainfall with cyclonic weather in the coastal belt.

4.06 Rice is the principal food crop of the State. The average yield rate

of rice in Orissa which was 14.96 quintal / ha. in 2003-04 declined to 14.55 quintal / ha. during 2004-05. The per capita production of food grains per annum, which was 189 kg in 2003-04, has declined to 181 kg in 2004-05.

Table 4.1

Foodgrain Production in Orissa

(in lakh MT)

Sl. No.	Food Crop	2000-01	2001-02	2002-03	2003-04	2004-05(P)
1	2	3	4	5	6	7
1	Rice	46.13	71.49	32.44	67.34	65.37
2	Total cereals	47.67	72.81	33.50	68.86	67.04
3	Total pulses	2.08	2.59	2.05	2.66	2.61
Total food grains (Sl. 2 +3)		49.75	75.40	35.55	71.52	69.65

P : Provisional Estimate

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

RICE

4.07 Rice continues to be the staple food of the people and it is being cultivated widely in the State. 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. Rice covered a total area of 44.92 lakh hectares during 2004-05 which constituted 76.9% of the total area under cultivation. A major factor to boost agricultural production is the enlargement of 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 14.26% during the period from 2000-01 to 2004-05. The total irrigated and un-irrigated area under HYV paddy during 2004-05 was 3,003.00 thousand ha. Area under HYV paddy over 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. With a view to encourage farmers to take up seed production of extra early, early and saline tolerant varieties of paddy suitable for escaping drought condition, production incentives were given to farmers through the Orissa State Seeds Corporation,(OSSC). Seed multiplication is

organised through departmental agricultural farms, Orissa State Seeds Corporation, seed village programme and private registered seed growers. During 2004-05, 231.60 quintals of extra early,

10,215.70 quintals of early paddy and a total of 89,700.01 quintal of paddy seeds were supplied by the Orissa State Seeds Corporation (OSSC)

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	2000-01	32.03	367.48	866.08	1,155.97	206.74	-	1,104.85	1,523.45
2	2001-02	30.00	395.00	852.00	1,301.00	272.00	-	1,154.00	1,696.00
3	2002-03	20.99	382.66	859.63	1,225.75	177.55	-	1,058.17	1,608.41
4	2003-04	15.22	434.64	839.09	1,345.94	253.47	-	1,107.78	1,780.58
5	2004-05	28.00	406.00	925.00	1,351.00	293.00	-	1,246.00	1,757.00

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

PULSES

4.08 Pulses are the important food grain crops, next to paddy. Efforts are being made for increasing production of pulses by bringing more areas under pulses to meet the growing demand. The total area under pulses accounted for about 12.28% (6.52 lakh ha) of the area under food grains (53.13 lakh ha.) and contributed about 3.74% (2.61 lakh MT) of total food grain production (69.65 lakh MT) of the State during 2004-05. 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, and block demonstration. Farmers and OSSC were provided with incentive of Rs.375.00 and Rs.125 per quintal respectively on production of certified seeds of various pulses taken up under the seed village programme with an expenditure of Rs.12.19 lakh and 2438 quintals of certified seeds were produced for supply to farmers.

OIL SEEDS

4.09 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 laid on production of certified seeds, supply of input kits, subsidised 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 2004-05 was 3.25 lakh hectare with production level of 1.75 lakh MT as against coverage of 3.08 lakh hectare and production level of 1.59 lakh MT during 2003-04. Out of the total area under oilseed crops during 2004-05, groundnut was cultivated in 27% of area followed by till in 15%. During 2004-05, Oilseed Production Programme (OPP), National Pulse Development Programme (NPDP), Accelerated Maize Development Programme (AMDP) and Oil Palm Development Programme (OPDP) have been merged into a single scheme named ISOPOM (Integrated Schemes of Oilseeds, Pulses, Oil palm and Maize) with 75% and 25% assistance from the Centre and the State respectively. A programme with a

total outlay of Rs.1,002.27 lakh was proposed during 2004-05.

COMMERCIAL CROPS

4.10 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. Area coverage under cotton is growing in Bolangir, Kalahandi and Rayagada districts. The production of cotton increased from 0.88 lakh bales in 2003-04 to 1.11 lakh bales during 2004-05. 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 8.58 lakh M.T. during 2003-04 to 9.26 lakh M.T. during 2004-05.

CROPPING PATTERN

4.11 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 2004-05.

Table 4.3

Cropping Pattern of Principal Crops in Orissa.

(Figures in percentage)

Sl. No.	Principal crop	2000-01	2001-02	2002-03	2003-04	2004-05(P)
1	2	3	4	5	6	7
1.	Paddy	77.5	76.2	77.7	76.4	76.9
2.	All cereals	81.1	79.5	80.8	79.3	79.8
3.	Total pulses	9.7	11.4	10.9	12.2	11.2
	Total food grains	90.8	90.9	91.7	91.5	91.0
4.	Oil seeds	5.9	5.5	4.9	5.2	5.6
5.	Fibers	1.4	1.8	1.3	1.3	1.4
6.	Other crops (sugarcane, potato, tobacco, chilly and ginger)	1.9	1.8	2.1	2.0	2.0
	All crops	100	100	100	100	100
	Total Area (thousand hectare)	5720	5907	5499	5891	5840

P : Provisional Estimate

Source : 1) Directorate of Economics and Statistics, Bhubaneswar.

2) Directorate of Agriculture and Food Production, Bhubaneswar.

3) Directorate of Horticulture, Bhubaneswar.

4.12 From the above Table, it is clear that only paddy covered 76.9% of the total cropped area during 2004-05, followed by pulses (11.2%) and oilseeds (5.6%). The area under fiber crops accounted for only 1.4% 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 2004-05 over 2000-01 while that of cereals and oilseeds has declined.

CROPPING INTENSITY

4.13 The cropping intensity of the State went up from 135% in 2000-01 to 152% in 2004-05. 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. Cropping intensity is one of the indices of the level of agricultural development. Table 4.4 shows net area sown, gross cropped area and cropping intensity from 2000-01 to 2004-05.

Table 4.4
Cropping Intensity for the Period from 2000-01 to 2004-05(P)

(Area in thousand hectare)

Sl.No.	Year	Net area sown	Gross cropped area	Cropping intensity (%)
1	2	3	4	5
1	2000-01	5,829	7,878	135
2	2001-02	5,845	8,798	151
3	2002-03	5,680	7,853	138
4	2003-04	5,796	8,637	149
5	2004-05(P)	5,739	8,701	152

Source : Directorate of Agriculture and Food Production, Orissa.

HORTICULTURE

4.14 Orissa is blessed with varied agro-climatic condition 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. 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 seeds. 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 During 2004-05, the total area under fruit crops in the State was 284.21 thousand hectes, out of which mango area accounted for 120.25 thousand hectare,

coconut 50.78 thousand hectare, banana 20.73 thousand hectare, citrus fruits 26.42 thousand hectare, pineapple 0.70 thousand hectare and papaya 0.74 thousand hectare. All other fruits covered 64.59 thousand hectare. Table 4.5 presents data on area, production and yield rate of different fruits during 2004-05.

Table 4.5

Area, Production and Yield Rate of different Fruits in Orissa during 2004-05(p)

Sl. No.	Name of the fruits	Area ('000 ha.)	Production ('000 MT)	Yield rate (qtl/ ha)
1	2	3	4	5
1	Mango	120.25	416.34	34.62
2	Banana	20.73	269.79	130.14
3	Citrus	26.42	204.66	77.46
4	Pine apple	0.70	7.74	110.57
5	Papaya	0.74	13.06	176.49
6	Coconut	50.78	2,746(lakh nuts)	5,408 (nuts)
7	Other fruits	64.59	492.38	76.23
Total		284.21	1403.97 and 2746 lakh nuts	60.15 and 5408 no.of nuts per ha.

P – Provisional

Source : Directorate of Horticulture, Orissa, Bhubaneswar.

4.16 During 2004-05, the total area covered under vegetable was 625.11 thousand ha. and production was 7,719.36 thousand M.T. as against 623.14 thousand ha. and 7,701.96

thousand M.T. respectively during the previous year. Table 4.6 summarises area, production and yield rate of vegetable crops during 2004-05.

Table 4.6

Area, Production and Yield Rate of different Vegetables during 2004-05(P)

Sl. No.	Name of the	Area	Production	Yield rate
---------	-------------	------	------------	------------

	vegetable	('000 hect.)	('000 M.T.)	(qtls./hect.)
1	2	3	4	5
1	Brinjal	127.71	1,852.24	145.03
2	Tomato	100.26	1,330.76	132.73
3	Cabbage	33.71	931.00	276.18
4	C. Flower	45.01	637.87	141.72
5	Pea	4.79	41.76	87.18
6	Okra	71.39	619.70	86.80
7	Sweet Potato	47.11	394.29	83.70
8	Potato*	8.51	80.77	94.91
9	Others	186.62	1,830.97	98.11
	Total	625.11	7,719.36	123.49

P - Provisional

* Directorate of Economics & Statistics, Orissa, Bhubaneswar.

Source :- Directorate of Horticulture, Orissa, Bhubaneswar

FLORICULTURE

4.17 In order to meet the increasing demand for flowers like Tuberose, Rose, Gladioli, Marigold, Crossandra etc. in and around the urban centres of the State, floriculture has been given due thrust in the planning process. Under this programme quality planting materials are supplied to farmers for taking up commercial cultivation of flowers in their fields, in addition to

conducting demonstrations. During 2004-05, 2,934 demonstrations on Gladioli, Marigold, Crossandra, Jasmine and Rose were taken up with an expenditure of Rs.61.38 lakhs. Under this programme, 64.18 lakh cuttings/seedlings of Gladioli, Marigold, Crossandra and Jasmine seedlings were supplied to the beneficiaries. Table 4.7 presents area and production of different floricultural crops in the year 2003-04 and 2004-05.

Table 4.7

Area and Production of different Floricultural Crops.

(Area in ha./ Prod. 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	14,581	41.62	92.19	11.37	11,36,800	33.62	540
2004-05(P)	221.05	16,599	46.14	98.63	12.07	12,05,960	34.92	555

P- Provisional

Source:- Directorate of Horticulture, Orissa, Bhubaneswar.

4.18 Steps were taken for plantation of short duration fruit species under work plan as well as RLTA in KBK region. 40.72 ha of new banana plantations were established under work plan by providing 16.02 lakh quality banana suckers to farmers at subsidised rate. Different fruit grafts have been supplied to farmers under the Work plan and RLTA for KBK during 2004-05 for raising 7,169 ha of fruit orchards covering 6,670 ha of mango, 51 ha of sapota, 97 ha of guava, 191 ha of litchi & 160 ha of custard apple at a cost of Rs.137.21 lakh. Small and marginal farmers are being encouraged to plant fruit trees in their backyards for supplementary income from their holdings. During 2004-05, 240 quintals of improved varieties of turmeric seeds and 64.09 quintals of suprava variety of ginger seeds have been multiplied in the Departmental farm covering an area of 16 ha. Attempt has been made under the work plan to promote and propagate root and tuber crops on a massive scale and to introduce improved crop varieties. Due to suitable agro-climatic conditions coupled with growing demand, vegetable

cultivation has tremendous scope in the state. To popularise seasonal and off-season vegetable cultivation in the State, Seed Minikits have been supplied to the small and marginal farmers. During 2004-05, 1,98,953 vegetable seed minikits have been supplied with an expenditure of Rs.139.32 lakh. The Central Sector Scheme "Integrated Development of Horticulture in Hilly/Tribal Areas" is being implemented in three tribal districts viz Keonjhar, Koraput and Gajapati. During 2004-05, 1428 ha. have been covered under different fruit crops in these districts, both seasonal and off-season.

4.19 The State Government have signed an agreement with the Agricultural & Processed Food Products Export Development Authority (APEDA) in January, 2003 for setting up an Agricultural. Export Zone (AEZ) on ginger and turmeric for contiguous districts of Kandhamal and Koraput for promotion of export of these commodities. Under Cashew Development Programme, 2,980 hectares have been covered during 2004-05, under new plantation by distributing 5.96 lakh grafts to the beneficiaries. For

2005-06, there is a proposal to cover 4,000 ha. under cashew plantation with a financial provision of Rs.244.26 lakh.

LAND REFORMS

4.20 The main objective of land reforms is to establish a new agrarian structure based on social justice by reducing inequalities in regard to possession of lands. Various 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 Land ceiling is imposed to acquire surplus lands by the Government and redistribute it among landless people. By the end of 2004-05, 1,64,515.595 acres of ceiling surplus land has been distributed among 1,47,186 landless persons as against 1,63,658.351 acres distributed to 1,46,450 persons by end of the previous year.

4.22 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 ensuring better land management and optimum utilisation of limited water resources. From inception of consolidation work; 10,039 villages have been taken up for consolidation. By the end of 2004-05, 7,939 villages with an area of 12,01,805 ha. of land have been covered under consolidation.

CROP INSURANCE

4.23 With a view to protecting the cultivators from the vagaries of nature, the Comprehensive Crop Insurance Scheme was introduced in the State during 1985. The prime objective of this scheme is to provide financial support on the event of crop failure in order to restore credit eligibility of farmers after crop failure for the subsequent cropping season. 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 Under NAIS during Kharif 2003, crops like paddy, maize, niger, red gram, cotton were covered and an amount of Rs.18.18 crore was paid to 38,188 farmers for the loss of crops over an area of 6.34 lakh ha. Similarly, an amount of Rs.9.82 lakh was paid to 1,335 farmers for the loss of crops like paddy, groundnut, mustard, potato, sugarcane covered under insurance over an area of 1.78 lakh ha. during Rabi season of 2003-04. During Kharif-2004, crops like paddy, groundnut, maize, niger, redgram, and cotton were covered under insurance over an area of 9.43 lakh ha. benefitting 45,657 farmers with compensation of Rs.14.69 crore.

DRY LAND FARMING

4.25 Dry land farming is practised under rainfed condition over more than 60% of the cropped area of the State for which yield rate is much lower. The programme of cultivation under rainfed condition aims at minimising the dependance on monsoon through conservation of water in small projects and maximising production through diversification of crops, mainly from dryland paddy to pulses and oilseed crops. The intensive approach of this

programme envisages development of water sheds for proper management of rain water and the extensive approach is 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.

4.26 Another measure taken to make dryland farming remunerative is mixed farming Paddy crops even in the medium and low land suffer from moisture stress in the event of early cessation 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 in order to increase moisture content of soil, water harvesting structures are being constructed in watershed areas.

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 stabilising production.

CONSUMPTION OF FERTILISER

4.28 Optimum use of fertilizer in an opportune time is an essential ingredient for increasing agricultural productivity. It also protects land fertility by meeting the nutrition requirement of crops. Consumption of chemical fertilisers in the State has increased from 42.28 kg per hectare in 1999-2000 to 43.00 kg per hectare in 2004-05. During 2004-05, the total fertiliser consumption in the State was 355.30 thousand MT as against 326.21 thousand MT during 2003-04. The fertiliser consumption is proposed to be increased to 74 kg per hectare by 2006-07.

4.29 Repeated use of chemical fertilisers without 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 fertilisers can also pollute the environment, particularly water. Bio-fertilisers have become an important tool for sustained agricultural production which reduces dependence on chemical fertilisers and thus reduces cost of

cultivation. Government encourage production and use of Green Manure, Azolla, Blue Green Algae etc. It was proposed to distribute 1,000 quintal of green manure seeds during 2005-06 for raising green manure.

4.30 The per ha. consumption of fertiliser for major states in the country from 1999-2000 to 2002-03 has been reflected in Table 4.8. The per ha. consumption of fertiliser 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 ha. consumption of fertiliser was highest in Punjab (174.99 kg) and lowest in Rajasthan (28.54kg) during 2002-03. The per ha. fertiliser consumption in Orissa has decreased substantially by 7.76% during the period 1999-2000 to 2002-03 as against the corresponding decline of 9.58% at all India Level.

4.31 In order to provide assistance to the farmers of 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.

Table 4.8
Consumption of Fertiliser in Selected States

(kg / hectare)

Sl. No.	Name of the State	1999-00	2000-01	2001-02	2002-03 (P)
1	2	3	4	5	6
1.	Andhra Pradesh	155.50	159.84	143.47	128.44
2.	Assam	27.94	35.68	38.81	42.73
3.	Bihar	85.22	97.48	87.39	87.15
4.	Gujarat	90.23	70.14	85.52	77.76
5.	Haryana	142.69	147.20	155.69	152.79
6.	Karnataka	103.30	109.52	101.48	90.91
7.	Kerala	72.46	59.38	60.72	68.17
8.	Madhya Pradesh	46.21	38.85	39.96	36.44
9.	Maharashtra	87.13	74.35	78.24	73.80
10.	Orissa *	42.28	40.52	39.00	39.00
11.	Punjab	184.22	166.69	173.38	174.99
12.	Tamil Nadu	158.74	145.31	141.55	114.00
13.	Uttar Pradesh	117.16	111.31	130.44	126.51
14.	West Bengal	129.04	113.68	126.82	122.23
15.	Rajasthan	42.37	31.06	38.88	28.54
All India		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 Timely use of pesticides is an essential activity to obviate crop damage. As high yielding varieties of crops are susceptible to pests and diseases, plant protection measures are as necessary as use of fertiliser. However, excessive use of pesticides may be hazardous to human health. As such, Integrated Pest Management (IPM) has been made a thrust area in the Tenth Plan 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 2004-05, 987.00 MT of pesticide / insecticide was utilised in the State as

against 1,028.50 M.T. during the previous year.

AGRICULTURAL MARKETING

4.33 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 regard to credit, fertiliser, pesticides, improved seeds, other inputs, agricultural products and consumer articles etc. 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.

4.34 Lack of marketing infrastructure leads to distress sale of farm products which works as disincentive to 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 was introduced and this aims at creating primary rural markets, extension, training of farmers and awareness campaigns.

AGRICULTURAL CREDIT

4.35 Agricultural credit is an essential input for augmenting agricultural production and helps a lot to the poverty stricken farmers of Orissa. The total amount of agricultural loans advanced by different Commercial Banks, RRBs, Co-operative Banks and OSFC during 2004-05 was to the tune of Rs.1904.03 crore which was higher by

43.50% as compared to Rs.1326.88 crore financed in 2003-04. Out of the total agricultural loan financed during 2004-05, the share of Co-operative Banks was 51.01% followed by 32.98% by Commercial Banks, 16.00% RRBs and 0.01% by OSFC. Apart from crop

financing, term lending for floriculture, horticulture, livestock, pisciculture, plantation and composite projects is also being encouraged. Table 4.9 reflects the amount of agricultural credit advanced in Orissa by different banks.

Table 4.9

Agricultural Credit Advanced in Orissa from 2000-01 to 2004-05(p)

(Rs. in crore)

Sl. No.	Year	Commercial Banks	RRBs	Co-operative Banks	OSFC	Total
1	2	3	4	5	6	7
1	2000-01	206.23	134.42	442.38	0.18	783.21
2	2001-02	266.40	129.80	532.25	0.54	928.99
3	2002-03	281.40	155.89	609.00	0.26	1,046.55
4	2003-04	434.89	167.65	724.03	0.31	1,326.88
5	2004-05(P)	627.89	304.66	971.26	0.22	1,904.03

P : Provisional

Source : State Level Bankers' Committee, Bhubaneswar

FARM MECHANISATION

4.36 Farm mechanisation has a great role in enabling farmers to take up timely and quality agricultural operations, reduce costs of production and improve the productivity. Various agricultural implements are supplied to farmers at subsidised rates. In KBK districts an additional 25% subsidy is given on power Tillers under RLTA. During 2004-05 emphasis given on demonstration of specialised power driven farm implements like self-propelled paddy transplanter, tractor operated renovator, power pulse thresher, maize sheller, sugarcane ridger/cutter/planter etc. So far 1649

power tillers, 466 tractors, 44 reapers, 3 paddy transplanters, 23 rotavators have already been supplied to the farmers at subsidised rates.

4.37 During 2005-06, it has been proposed to supply 2435 power tillers, 100 paddy reapers, 10 paddy transplanters, 865 tractors, 60 tractor operated rotavators and 200 other implements with subsidy. Besides, 200 power tillers will be subsidised in the KBK districts under RLTA with a provision of Rs.54.20 lakh. Agro service centres under the world Bank assisted Cyclone Restoration Programme have helped farmers to use custom-hired tractors and

CHAPTER 4

other agricultural implements. During 2004-05, 14 Agro Service Centres have been set up till January and subsidy amounting to Rs.18.77 lakh have been released 250 Agro Service Centres will be set up under the programme during the next 2 years.

TRANSFER OF TECHNOLOGY

4.38 The farmers are being sent on exposure visits to other States and within the State to gain awareness and knowledge on advanced technologies. This has been very effective for transfer of technology. During the year 2004-05, 420 farmers went outside the State and 443 farmers visited places inside the State for exposure with a financial involvement of Rs.13.31 lakh. During 2005-06, it is proposed to send 1,300 farmers to outside the State and 1,000 farmers inside the state for exposure visits at a cost of Rs.46.50 lakh.

SOIL CONSERVATION

4.39 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 the

ECONOMIC SURVEY

AGRICULTURE

livelihood of the community. Soil Conservation activities are taken up on water-shed 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 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 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. During the year 2004-05, the programme is being implemented in 174 watersheds with a treatable area of 87,662 ha. 40 more micro watersheds (32 in Bolangir and 8 in Nuapada) have

CHAPTER 4

been sanctioned during the current year with the treatable area of 0.20 lakh ha. The project would expand to two more districts namely Kalahandi and Bargarh during the current year.

WATERSHED MISSION

4.41 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 (NWDPR), River Valley Project (RVP), etc. The Watershed Development Programmes are also implemented with Additional Central Assistance received under RLAP for KBK districts. One externally aided project funded by DFID namely Western Orissa Rural Livelihood Project (WORLP) is also currently being implemented in two districts namely, Bolangir and Nuapada and is expanding to Kalahandi and Bargarh during 2005-06. 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

AGRICULTURE

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) was set up as a State level Umbrella Institution for monitoring, co-ordinating and strengthening the watershed programme in the State. The watershed programmes were implemented through various Government agencies that acted as PIAs

(Project Implementing Agency) previously. 314 Micro watershed projects are taken up under the RLTAAP for KBK since 2002-03, with a project cost of Rs.100.57 crore for treating 1.67 lakh ha. During 2004-05 by December, Rs.526.53 lakh was utilised for treating 12,747 ha. area totaling to Rs.2,969.47 lakh and treatable area of 0.46 lakh ha. During 2005-06, the treatment of above 314 watershed will be continued with a programme for treating 32,200 ha. with a provision of Rs.1,937.45 lakh against the requirement of Rs.3,000.00 lakh.

4.44 There are 47 identified blocks in 8 districts of Orissa which were covered under Drought Prone Area Programme (DPAP). Under this Programme 910 Micro Watershed Projects are under implementation and 66 projects have been completed in Bolangir, Sonapur and Kalahandi districts. 192 projects have been sanctioned at the cost of Rs.4,000/- (Rs.5000/- in respect of KBK districts) per hectare. The remaining 784 projects have been sanctioned at a new cost norm of Rs.6,000/- per hectare on an uniform basis. The total outlay for all the 976 sanctioned projects is Rs.27,863.86 lakh for treatment of 4.96 lakh hectares. An amount of Rs.7,346.11 lakh has been spent in treating 1.48 lakh hectares by March,2005.

AGRICULTURAL PROMOTION AND INVESTMENT CORPORATION LTD (APICOL)

4.45 The Agricultural promotion and Investment Corporation of Orissa Limited (APICOL), since its inception as a promotional organisation is engaged in promotion of commercial agricultural enterprises including agro based and 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. During 2004-05 APICOL has promoted 10 agro and food processing units with an expenditure of Rs.4.03 crore. During 2004-05 it has released Rs.1.35 crore as subsidy in favour of 27 units.

CENTRAL RICE RESEARCH INSTITUTE (CRR)

4.46 The Central Rice Research Institute, Cuttack has been providing rice research support to the entire country in general and Orissa in particular in meeting the great challenge of feeding vast Indian population since 1946. CRR is inventing low cost improved rice production technologies such as high yielding rice

CHAPTER 4

varieties for different eco-systems, improved agricultural implements and suitable rice based farming systems under different eco-systems and advises the farmers to adopt these technologies. Till now 63 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 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 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 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 at par with the well known submergence tolerant variety FR13A. This institute has also played a major role in transfer of technology from laboratory to

ECONOMIC SURVEY

AGRICULTURE

farmer's field through Krishi Vigyan Kendras (KVKs), Institute of Village Linkage Programme (IVLP), Farming System Research Education (FSRE) etc. CRRI 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, CRRI 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 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 Sciences etc.

CHAPTER 4

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. 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 the state, along-with 46 All India Coordinated Research Projects and 41 National Agricultural Technology Projects currently operating in the University. There are 16 Krishi Vigyan Kendras operating in the University with 100% assistance from ICAR for transfer of technology to the farmers field. During 2004-05, the University has made significant contribution in terms of developing and testing of appropriateness of technologies suitable to different field

AGRICULTURE

situations for adoption. Besides, Research and field trials continued in four varieties of rice, three blackgram and one variety of brinjal and cowpea each, which are in the pipeline for release. The University has produced 1.82 lakhs of quality planting materials of Mango, Guava, Litchi, Rose and Cashew during 2004-05. In Kharif 2004, programme was taken up for production of foundation paddy seeds in 180 ha. and certified paddy seeds in 75 ha. and non paddy seeds in 14 ha.

AGRICULTURAL CENSUS

4.48 There were 39.66 lakh operational holdings in the State as per 1995-96 agricultural census, which was 38.84 lakh during 1990-91 showing 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)		
		1990-91	1995-96	% variation	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	3966	2.11	5208	5144	(-) 1.23
		(100.00)	(100.00)		(100.00)	(100.00)	

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

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

4.49 Distribution of land holdings by different social groups as per 1995-96 agricultural census is depicted in Table 4.11. There were 5.46 lakh SC and 11.78 lakh ST operational holdings in the State with 4.89 lakh and 16.29 lakh ha. 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%.

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)		
		SC	ST	All groups	SC	ST	All groups
1	2	3	4	5	6	7	8

CHAPTER 4

AGRICULTURE

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)	1,178 (29.70)	3,966 (100.00)	489 (9.51)	1,629 (31.67)	5,144 (100.00)

N.B. : Figures in brackets indicate percentage.

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

V V V V V