

CHAPTER IV

AGRICULTURE AND IRRIGATION

INTRODUC-
TION

The economy of the district is mainly dependent on agriculture, which employs about 84 per cent of its labour force (1971 Census). This is not because agriculture is well developed in the district, but due to the fact that opportunities for gainful work outside agriculture are extremely limited. Irrigation facilities in the district are not developed. Although normal rainfall is 1,378 mm., its erratic nature and uneven distribution has been the cause of crop failure for several years in the past. The total net sown area of the district was 464,000 hectares during 1976-77, out of which 29,945 hectares was irrigated in the Kharif season and 3,218 hectares in the Rabi season. The rest had to depend upon rainfall.

The plains of the district are inhabited by some big progressive farmers who have introduced mechanisation in farming. In hilly areas, inhabited by tribal people, agricultural practices are primitive and shifting cultivation is prevalent on a large scale. Manure is scarcely used and there is hardly any artificial irrigation.

The district has excellent scope for horticulture and plantation crops.

LAND UTI-
LISATION

The major resources of the district are the vast arable lands which are suitable for agriculture.

The district can be divided into two distinct physiographical regions—(i) the plains and (ii) the hill tracts. The plains which are found throughout the district covering about 50 per cent of the total district area are intersected here and there by hill ranges, isolated peaks and running streams. The areas under Dharamgarh and Jayapatna *tahsils* are the important plain tracts, highly fertile and constitute the best cultivated lands of the district. Hills in the district rise precipitously from the plains and are covered with dense forests, wantonly cleared at places for cultivation.

The statement below gives a picture of land utilisation in the district (1976-77) *

	(in hectares)
Total cropped area ..	556,000
Net area sown ..	464,000
Fallow ..	55,000
Forest ..	506,000
Other uncultivated land including groves and pastures ..	94,000
Cultivable waste ..	7,000
Area not available for cultivation ..	32,000

* *Source*—Director of Agriculture and Food Production, Orissa

Shifting cultivation or Podu Chas (also called Dongar Chas, Kudki Chas or Kudu Chas) is widely practised by the tribal farmers in the hilly areas of the district. The vegetation on the hill tops and slopes are cut during the months of January and February and are left there to dry. Towards the end of April or the beginning of May these trees are burnt and the ash is spread over the land. On the approach of rains the patch of land is ploughed if the slope is moderate or worked by manual labour (*kudki chas*) with the help of spades, if the slope is steeper. Various crops, often in mixed pattern, are grown on the fields so prepared. Maize, Jower, tur and minor millets are generally grown in the fields. The fertility of the piece of virgin land so reclaimed lasts for about two to three years after which its cultivation is given up and the farmer shifts to a fresh patch and repeats the process. This is a wasteful method of cultivation which has caused acute soil erosion in the area and has depleted valuable forest wealth which also affects environmental conditions. It is difficult to change this habit of the tribals and encourage settled farming among them because of their deep-rooted traditions in this regard. Government have taken up many schemes like allotment of land for horticulture, plantation of fruit bearing trees, etc., for preventing the tribals from taking to shifting cultivation.

The problems of soil erosion is acute in the district in hilly areas due to undulating topography, intense rainfall and the harmful practice of shifting cultivation prevalent in the hilly tracts. Rapid loss of soils through serious erosion creates numerous rills and gullies and waste lands devoid of any vegetation which poses serious problem for the entire area. Hence the need for soil conservation measures is felt all over the upland, on the hills, in the degraded forests, the degenerated grazing grounds, etc.

The State Government have taken a number of anti-erosion measures, such as, contour bunding, levelling, gully control, conservation farming, plantation of economic species, etc. The unculturable waste lands which are the major foci of soil erosion are being put under miscellaneous fruit tree plantations with species like cashewnut, mango, jack-fruit, tamarind, *ber*, etc. Sisal plantation has been undertaken on a large scale to check soil erosion. Coffee plantation in Thuamul-Rampur area has been undertaken as an anti-erosion measure. The Soil Conservation Department has also undertaken land reclamation and land development work in the lands allotted to the landless persons in this area. The cost of reclamation comes to about Rs. 500 per acre out of which 50 per cent is borne by the I. T. D. P. as subsidy to the beneficiaries and the rest is received by the cultivators as loan from the local Land Development Bank.

* I. T. D. P.—The Integrated Tribal Development Project
1 acre—0.404687 hectare

LAND
RECLAMA-
TION

Waste land is being leased out every year to landless persons for cultivation. These people are also granted loan for this purpose under the Land Improvement Loans Act, Agriculturists Loan Act, and other State aids. Besides, the poor cultivators are being provided with loan from the Land Development Bank and Government subsidy for reclamation. This constitutes a part of the accepted policy of the Government to encourage people to cultivate waste lands. During the last 5 years about 18,454 hectares of Government waste land have been leased out to 21,925 persons.

Besides the above, reclamation work through Government agencies have been undertaken in some areas of the district. During 1976-77 an area of about 162 hectares was reclaimed in the district through the Soil Conservation Organisation.

IRRIGATION

Irrigation facilities are highly deficient in the district. Although its economy is largely dependent on agriculture, no regular or systematic irrigation facilities have been developed so far. The district has a satisfactory rainfall, but it is frequently affected by droughts due to untimely rain and its uneven distribution. Possibilities of irrigation expansion are rendered meagre on account of the undulating terrain and the absence of suitable locations for the storage of rain water. As hard rocks are found below 9 to 12 metres of the ground surface in most part of the region, tube wells for lift irrigation are neither feasible nor economical. Tanks and wells are the important sources of irrigation. Most of the tanks, however, are in derelict condition and need repair and renovation as the water available therein does not last beyond December. Wells which irrigate only small plots of land somewhat on a regular basis suffer from paucity of supply and become dry in the summer, reducing the extent of thier utility.

At present cultivation is largely confined to the Kharif season. Most of the irrigation facilities currently available are used during the rainy season. Of the total net sown area of 464,000 hectares in 1976-77, only 30,000 hectares (above 6 per cent) were under irrigation during the Kharif season. Irrigation facility in Rabi season was negligible (about 3,000 hectares). Irrigation facilities are somewhat developed in Dharamgarh and Jayapatna *tahsils*, but such facilities are scant in Lanjigarh and Nawapara *tahsils* which are worst affected in the years of drought.

The irrigation projects of the district are discussed below.

Major Irri-
gation
Project

At present there is no major irrigation project in the district. One such now under contemplation is the Upper Indravati Project which is a multi-purpose project estimated to cost about Rs. 7,500.00 lakhs. When completed, this project is expected to irrigate 98,300 hectares in Kharif and 78,160 hectares in Rabi season in Jayapatna and Dharamgarh *tahsils* of this district.

The construction work of the Uttei medium irrigation project has been completed with an outlay of Rs. 200.65 lakhs and it is providing irrigation to an area of 9,300 hectares during Kharif and 120 hectares during Rabi season.

The construction work of the Saipala Medium Irrigation Project is nearing completion with an outlay of Rs. 191.03 lakhs and is providing irrigation to an area of 270 hectares during Kharif season and 20 hectares during Rabi season in Kalahandi district. After completion it will irrigate an area of 570 hectares during Kharif and 300 hectares during Rabi in this district. This project is likely to be completed by 1978-79.

The construction work of the Sunder Irrigation Project is in progress. Its estimated cost is Rs. 371.71 lakhs. After completion it will irrigate an area of 2,760 hectares in Kharif and 1,470 hectares in Rabi season. The project is expected to be completed by 1978-79.

The following irrigation projects are proposed to be undertaken in the district.

Name of the Project	Estimated cost (Rs. in lakhs)	Irrigation potential (in hectares)	
		Kharif	Rabi
(1)	(2)	(3)	(4)
Jonk Irrigation Project	1,135.00	11,350	6,050
Sandul Irrigation Project	516.00	5,160	2,750
Indra Irrigation Project	365.00	7,280	..
Sagoda Irrigation Project	1,135.00	11,350	6,050
Rajna Dam	1,135.00	11,350	6,150
Udanti	8,250.00	39,000	20,800
Pendrawan	84.00	840	450
Uttei Dam	660.00	6,600	3,500
Lower Indravati
Hati weir	(combined with Upper Indravati Project)		

Out of the above projects, the Jonk Irrigation Project, the Sandul Irrigation Project and the Indra Irrigation Project have been selected for execution during 1978—83. The rest are under investigation.

Minor
Irrigation
Projects

There are 57 minor irrigation projects in the district with an ayacut area of 15,404 hectares. Most of these projects provide seasonal irrigation. Tahsil-wise details of these projects are given below.

Name of the Tahsil	No. of Minor Irrigation Projects	Total certified ayacut (in hectares)
1	2	3
Bhawanipatna	.. 17	4,767
Lanjigarh	.. 5	1,435
Jayapatna	.. 10	3,731
Dharamgarh	.. 6	2,614
Nawapara	.. 8	946
Khariar	.. 11	1,112
Total	.. 57	15,405

Lift Irrigation

The major part of the district comes under Archean formation. Only some parts of Koksara Block bordering the district of Koraput and parts of Boden, Nawapara and Komna Blocks bordering Madhya Pradesh have evidence of sedimentary formation. The ground-water development in the district can be taken up through the construction of dug wells, bore wells and dug-cum-bore wells. The extent of weathering of bed rock has been noted to be varying from moderate to extensive in different parts of the district.

The entire district has been covered under preliminary phase of ground water survey. The annually restorable ground water potential has been estimated to be 203.56 thousand hectare metres which can sustain installation of 21,660 numbers of standard open wells and about 2,000 bore wells to create irrigation potential for 47,320 hectares in Kharif season and 25,660 hectares in Rabi season. At present the district has 7,436 irrigation wells mostly provided with indigenous water lift with irrigation potential of 2,500 hectares.

The average annual rainfall of the district is reported to be 1,378 mm. The important rivers, viz., Hati, Tel, Utai, Udanti, Ret, Sagada and Sunder carry ample of flow in rain, but the size of flow gets reduced considerably by winter and summer. Still then these rivers provide immense scope for installation of river lift projects which can meet the supplementary irrigation requirement of Kharif crop and help to raise light and medium duty crops in winter season.

At present twenty-four river—lift irrigation projects have been started in the district which command 485 hectares of land during Kharif and Rabi seasons.

No proper soil survey has been undertaken in Kalahandi. The district has mainly the following three types of soil—red laterite, black soil and sandy loam, The red laterite soil is found all over the district. It is deficient in phosphorus and nitrogen. Black soil is found mostly in Bhawanipatna, Nawapara and Dharamgarh *tahsils*. It is rich in potassium and magnesium, but poor in nitrogen and phosphorus. It is best suited for the cultivation of paddy, cotton, chillies, tobacco and *rabi* crops like pulses and wheat. Sandy loam is found in Lanjigarh, Bhawanipatna and Nawapara *tahsils* which are suitable for the cultivation of oil-seeds and root crops. The river side areas on the banks of the river Tel, Utai, Sagoda, etc. have alluvial sandy and sandy loam soils. The best cultivable soils are found in the plains of Nawapara, Dharamgarh and Jayapatna *tahsils*. Soil

The cultivated lands of the district are classified as *bahal*, *berna*, *mal*, and *att*. *Bahal* and *berna* lands are low lying areas and are most fertile, and give better yield than the other two types of lands. These lands are used mostly for the cultivation of paddy. *Mal* is the embanked lands and slopes which are terraced to catch the surface drainage coming down from uplands. Generally, the uplands of the area entirely depending on rain water are called *att*. *Mal* and *att* lands which are considered as second and third class lands respectively are more suitable for crops which are less dependent on moisture. Besides the above four classes of land, the high lands where shifting cultivation is undertaken are locally called *dongarla*. LAND

Food grains constitute the predominant crop of the district which covered 82 per cent of the gross cropped area of 5.56 lakh hectares in 1976-77. Paddy is the principal crop which alone accounted for 47 per cent of the gross cropped area in 1976-77. Other cereals and millets normally grown in the district include wheat, maize, Jower, bajra, minor millets, etc. Pulses like *arhar*, *mung*, *biri*, *kulthi*, field pea, etc., are also extensively grown which accounted for 16 per cent, whereas oil-seeds form the main commercial crop and covered 8 per cent of the gross cropped area. Other commercial crops like sugarcane, sweet potato, potato, onion, garlic, chilli, vegetables, tobacco, jute and mesta are grown moderately due to lack of irrigation facilities. Paddy, ragi, maize, jower, jute, mesta, vegetables, chilli, groundnut, etc., are mostly grown in the Kharif season. Crops usually grown in the Rabi season are wheat, winter paddy, oil-seeds, potato, tobacco, onion, garlic, coriander and some varieties of pulses. The area under different crops and their yield-rates are given in Appendix I. CROPS

Paddy

Paddy is the most important crop and is extensively grown in the district. During 1976-77 it covered an area of 2,59,800 hectares and 1,69,560 tonnes of rice were produced. The average yield being 10.04 quintals (in terms of paddy) per hectare.

There are three regular rice crops, namely, Autumn, Winter and Summer. Early varieties of paddy of 60 to 90 days duration are grown in about 80 per cent of the uplands. The high land rice is sown at the commencement of the rains i.e., in June and July and harvested towards the last part of September. The Autumn rice is sown in June and harvested in October. The Winter rice, grown on low lands, is sown or transplanted in July/August, and harvested in November and December. In some hilly areas in the southern part of the district the stream beds are cultivated with Summer paddy to a very limited extent. A traditional variety of paddy called 'Baya' was generally cultivated. It was also called *Amdhan* as its period of cultivation corresponded with the season of mango crop. The stream beds were converted into terraced fields when the flow of water went down and the plants were transplanted towards the end of May. At present its cultivation has been discontinued and the variety has been replaced by short duration high-yielding varieties like P. T. B.-10.

The plains of Dharamgarh and Jayapatna Tahsils are agriculturally most prosperous and considered as the granary of the district. These are the chief rice growing areas and are inhabited by a number of progressive farmers. Although high yielding varieties of improved paddy have been introduced in the district, their scope is now limited due to lack of assured irrigation facilities. It has not yet been popular with the tribal farmers of the district who cultivate only traditional crops of local varieties. During 1976-77, high-yielding varieties were grown in only 24,508 hectares in Kharif season and in 700 hectares as Summer rice.

Dubraj, Jhilli, Puagi, Baidalhunda, Mahipal, Chinamali, Kusuma, Kali Khuji, Assamchuri, Nanka, etc., are the popular local varieties of paddy grown in the district. Parijata, Ratna, Annapurna, T-141, Mosouri, etc., are the high-yielding varieties of paddy gradually gaining popularity.

Wheat

As stated earlier, wheat was not in cultivation in this district when Lt. C. Elliot visited the place in 1856. During the beginning of the present century it was grown only in some high lands where rice and wheat were cultivated alternately. Crops of wheat were raised by means of natural irrigation. Strictly speaking, the cultivation was confined to those villages where the members of the ex-Zamindar families happened to reside.

At present the cultivation has extended to other parts and is being grown under irrigated as well as non-irrigated conditions. Under non-irrigated conditions it is sown broadcast after the cessation of rains and then ploughed. In irrigated lands it is sown in November after the harvest of early or medum maturing paddy and also in uplands specially in Thuamul-Rampur and in other parts where there is assured irrigation facility.

Introduction of high-yielding varieties of wheat have completely replaced the common varieties cultivated earlier in the district. During 1970-71 normal wheat was cultivated in 958 hectares and the high-yielding variety in only 287 hectares. But the area under wheat cultivation is on an increase. During 1976-77, a total area of 3,198 hectares was put under the high yielding varieties like Sonalika and Janak, the production being 4,098 tonnes, and the yield per hectare 12.8 tonnes.

Among other cereals grown in the district important are Ragi, maize and Jowar. Ragi is cultivated fairly extensively during Kharif season and the area covered in the Rabi season is negligible. During 1976-77 an area of 26,621 hectares was put under this crop. The total production was 10,950 tonnes with an yield rate of 4.1 quintals per hectare. Improved varieties like Dibyasinga and AKP-2 have been introduced in the district.

Other
Cereals
Ragi

Maize was cultivated over an area of 14,319 hectares in 1976-77, production was 9,404 tonnes and the yield was 6.6 quintals per hectare. The introduction of composite maize varieties, viz., Vikram, Vijaya, Jawhar, Protina, etc. have helped the cultivators in getting a higher yield by using their own seed stock. But still the local varieties are extensively cultivated in the district. During 1976-77 an area of 2,196 hectares was put under hybrid maize, whereas the common local varieties were cultivated in 11,869 hectares. Maize is also being grown in Rabi season in the peripheries of wheat crop or as a mono crop since 1974. The total maize produced during the year was 9,404 tonnes. Major maize growing areas are Thuamul-Rampur, Karlamunda, Lanjigarh, Madanpur-Rampur, Narla and Jayapatna.

Maize

The cultivation of Jowar is mostly practised in Kharif season by the tribal people in hill slopes and on hill tops, and its cultivation is almost absent in the plains. Improved and high-yielding varieties have also been introduced in the district. In 1976-77 an area of 5,123 hectares was cultivated with Jowar and the production was 3,237 quintals. Bajra was cultivated in a limited scale covering an area of 364 hectares (1976-77) and the production was 166 quintals.

Jowar and
Bajra

Minor
Millets

During 1976-77 minor millets were cultivated in 56,816 hectares. The total production being 19,342 tonnes. Jhari, Kodo, Gurji, Kango and Khoshla are popularly grown by the tribal cultivators of the district in hill slopes and uplands. These crops are not remunerative and yield less. They grow these crops for these are harvested in August and immediately cater to their needs at a time when their food stock gets exhausted. These are cultivated without much care. No weeding or manuring is practised. In other words, after ploughing and sowing the cultivators turn up to the field only when harvesting commences.

Pulses

Among pulses, black gram (*biri*), green gram (*mung*), tur (*arhar*), lentil, gram, cowpea, *kulthi*, field pea, etc. are grown in the district. The total area under pulses was 90,636 hectares in 1976-77. Production was to the tune of 31,209 tonnes with an yield rate of 3.4 quintals per hectare. Among the pulses *biri* is the most important crop which covered 21,334 hectares followed by *mung* which covered 18,052 hectares in 1976-77.

Biri and *mung* seeds are sown in July-August. The land is ploughed and cross ploughed after sowing. The crops are harvested in October-November. These pulses are also cultivated during Rabi season in paddy fields before or after the harvesting of paddy depending on soil conditions and are irrigated at least twice where there is facility for irrigation. These are harvested in April.

Tur is cultivated in uplands, hill slopes and on fields. In uplands it is also sown as a mixed crop with early paddy. Gram is extensively grown in the black soil found mostly in Bhawanipatna, Nawapara, Dharamgarh and Lanjigarh *tahsils*. Short duration and high-yielding varieties like Pusa Baisakhi *mung*, T. 9 and T. 65 *biri* have been introduced in the district and these are gradually becoming popular.

Oil Seeds

Gingelly (*til*), mustard, lin seed, castor and groundnut are the principal oil-seeds cultivated in Kharif and Rabi seasons in the district. Nizer is cultivated as a minor crop, sunflower and safflower are grown only in a limited scale at present.

Til

Til is grown both in Rabi and Kharif seasons. The cultivation of summer gingelly in the district is rather recent. The Kharif crop is sown in June at the onset of monsoon rains and harvested in September, while the Rabi gingelly is sown in October and harvested in January. During 1976-77 cultivation of gingelly covered 12,497 hectares.

Cultivation of mustard is restricted to highly fertile lands. Extensive cultivation of this crop is found in Thuamul-Rampur, Lanjigarh, Jayapatna and Madanpur-Rampur areas. The indigenous varieties are mainly grown. Improved and short duration varieties like M-27 and Approxmutant introduced in the district are gradually becoming popular among the cultivators. During 1976-77 an area of 10,224 hectares was put under mustard cultivation.

Mustard

The linseed crop is grown in uplands from October under non-irrigated conditions. Sometimes land is left fallow prior to sowing, or it is sown after the harvesting of early paddy. In 1976-77 this crop covered an area of 8,555 hectares.

Linseed

Castor is sown in June and October in combination with gram and linseed. It is a common practice to dibble them on the newly laid bunds in cropfields during Kharif season. After sowing it is left all to itself till harvested. During 1976-77 this crop covered an area of 6,524 hectares.

Castor

Groundnut is cultivated mostly in the Kharif season and its cultivation in Rabi season is insignificant. Light soil is congenial for this crop. The land is ploughed thoroughly and a small amount of manure is added. The crop is sown in June and harvested in October. Improved and highyielding varieties like AK 12-24 and Polach are gradually becoming popular in the district. The cultivation of this crop covered an area of 3,145 hectares in 1976-77.

Groundnut

The cultivation of nizer is more marked in the uplands of Thuamul-Rampur, Lanjigarh and Madanpur-Rampur area. It is sown in August—September and harvested in December—January. In 1976-77 this crop covered an area of 2,707 hectares.

Nizer

Oil seeds are the only commercial crops of some importance grown in this district covering 8 per cent of the cropped area. The yield rate of major crops do not compare favourably with the State average. During 1976-77 the total area under oil seeds was 44,441 hectares. The production figures was 20,062 tonnes with an yield rate of 4.5 quintals per hectares.

Among fibre crops mesta, sunhemp, cotton and jute (to a very small extent) are cultivated in the district. During 1976-77, these crops covered an area of 4,620 hectares.

Fibre Crops

In most cases mesta is grown on field-bunds and on the periphery of sugarcane fields and also as a mono crop. The crop is harvested in November-December. Improved seeds of mesta have been introduced in the district and its cultivation is gradually becoming popular. During 1970-71 only 1,915 hectares were put under this crop, but the area of cultivation increased to 3,487 hectares in 1976-77 and 11,614 bales ‡ were produced.

‡ One bale—180 kg.

Sunhemp is mainly grown in Dharamgarh and Nawapara subdivisions in scattered patches. During 1976-77 it covered an area of 426 hectares and yielded 1,065 bales.

Cultivation of cotton was previously confined to localised areas adjoining the cultivator's homestead land. The need to experiment it on more extensive scale was felt first during the Durbar administration when the demand for cloth rose far beyond the supply. The scarcity of cloth became more acute due to the Second World War when people went without any regular supply of cloth. Black cotton soil occurs extensively in the district. But the incidence of heavy rains for a continuous period and the lack of irrigation facility for regulated supply of water are the main drawbacks for cotton cultivation in this area. Previously a local variety known as Turtari (*Gossypium arboreum*) was grown. During recent years improved varieties like MCU—5 and Mutant have been introduced. Cotton cultivation is gradually becoming popular. During 1976-77 an area of 670 hectares was cultivated with cotton which yielded 650 bales. Although jute cultivation has been introduced in the district since about 15 years, the cultivators are not well inclined to grow this crop. During 1970-71 an area of 175 hectares was cultivated with this crop, but during 1976-77 its cultivation was limited to only 40 hectares because of the poor yield due to the climatic conditions in the district.

Sugarcane

Sugarcane was cultivated in a limited scale in the district mainly in irrigated lands and in homestead lands. But gradually its cultivation is becoming popular among the local farmers. In 1970-71 an area of 2,281 hectares was under sugarcane cultivation. It increased to 4,600 hectares in 1976-77 and 32,040 tonnes of *gur* was produced. Improved varieties of cane have been introduced in the district. The yield rate of 70 quintals per hectare is more than the State average.

Vegetables

The main vegetables cultivated in the district are sweet potato, onion, potato, cole crops, tomato, pumpkin, ridge gourd, bottle gourd, brinjal, etc. Generally vegetables are grown in lands lying close to the habitation and with easy irrigation facility. The climate of this district is congenial to the growth of cole crops and other vegetables. Among the vegetables, sweet potato was cultivated in 5,579 hectares and onion in 5,164 hectares. Cultivation of potato was negligible. During 1976-77 the total area under vegetable cultivation was 32,765 hectares.

Condiments and Spices

Chilli, corriender, garlic, ginger and turmeric are cultivated in the district, chilli being the most important among them. It covered an area of 7,119 hectares in 1976-77 and the production was to the tune of 2,517 quintals. Turmeric is mainly grown in the hill tracts of Golamunda and Lanjigarh by the tribal people in shifting cultivation.

Tobacco is cultivated in 2,215 hectares (1976-77) of land in the district as a commercial crop. During 1976-77, 746 tonnes of tobacco was produced with an yield rate of 3.4 quintals per hectare. Local varieties are generally cultivated. Tobacco

The climate and topography of some areas in the district, viz., Thuamul-Rampur block in Bhawanipatna *tahsil* and Lanjigarh block in Lanjigarh *tahsil* are excellently suitable for horticulture. In Thuamul-Rampur area mango, banana, pineapple, papaya, etc. are grown on a limited scale. Lanjigarh area is noted for banana, orange, pineapple, papaya, guava, jack fruit, etc. Cashew-nuts are being cultivated on hill slopes affected by shifting cultivation. Fruits

Fruit cultivation was being patronised by the Rulers and Zamindars of the ex-State and they still retain some old orchards. As observed by Cobden-Ramsay in the Gazetteer of the Feudatory States of Orissa, orange was cultivated in considerable quantities and produced very fine fruits in the Lanjigarh areas since the beginning of the present century. Considerable area was put under orange plantation for export. The orange plants which Cobden-Ramsay mentions are still there in the ex-Zamindari area, but their yield and quality have considerably gone down.

At present various development programmes provide impetus to the people to grow fruits. Citrus fruits and guavas hold great potentiality. The State Government contemplate to establish fruit orchards in each Grama Panchayat. Besides, the school orchard scheme has been launched under the Applied Nutrition Programme. During 1976-77 the total area covered by orchards and fruit trees was 1,795 hectares.

Grafts and seedlings of various fruit trees are being raised in the transit nurseries both at Bhawanipatna and Khariar for sale and distribution to the farmers of the district. The quantity of important grafts and seedlings distributed during 1977-78 is given below :

Name of species	Seedlings	Grafts
Mango	10,385	3,976
Jack fruit	4,373	..
Lemon	5,847	1,137
Orange	1,267	266
Guava	885	2,467
Pomegranate	661	142
Ber	1,059	..
Sopeta	..	300
Coconut	..	976
Banana	..	535

Coffee Plantation

The soil and climatic conditions of Thuamul-Rampur area of the district have been found excellently suitable for coffee plantation according to a survey conducted by the experts of the Coffee Board. The average elevation of the area varies between 2,500 feet to 3,000 feet (750 mt. to 900 mt.) which is conducive to the growth of coffee plants. At present coffee is grown in an area of about 140 hectares. Its plantation has been taken up as a soil conservation measure.

IMPROVEMENT OF AGRICULTURE AND STATE ASSISTANCE

The district enjoys a short monsoon period with erratic precipitation both in intensity and its distribution. The farmers of this district are used to monocrop system of cropping usually with long duration local paddy. Most of the farming communities of this district are small and marginal farmers. Their socio-economic condition being very poor they need ample assistance to follow improved agricultural practices. Generally the yield rate of different crops in the district is low due to poor soil conditions, lack of assured irrigation and ignorance of the majority of the cultivators to switch over to scientific method of farming. Yield rates also vary widely within the district depending on the above factors. The plains of Bhawanipatna, Dharamgarh and Jayapatna *tahsils* give higher yield than the hilly areas. But the most important factor adversely affecting the yield rates is the small extent of irrigation facility available in the district (6 per cent of the net cropped area) which restricts the introduction and efficacy of improved agricultural inputs like high-yielding seeds and fertilisers.

Government have implemented special projects like Drought Prone Area Programme and Integrated Tribal Development Project in the district to help the small and marginal farmers in the district to move away from their subsistence farming and achieve a better socio-economic standard. Use of tractors and pumps are increasing. Other plant protection implements like sprayers and dusters are being used by the farmers for applying insecticides. The traditional wooden plough has been replaced by iron plough in many places. Improved agricultural implements like mould board plough, seed drill, garden rake, trench hoe, sprayers, etc. are being supplied at subsidised rates to the poor farmers of the district. Demonstrations in the cultivators' fields are being conducted by the Agriculture Department to convince them about the modern farming methods. The local cultivators are accustomed to growing long duration paddy varieties for good harvest under favourable weather conditions. But due to uncertainty of monsoon they sustain heavy loss to the extent of total crop failure. So it has become necessary to introduce and popularise short-duration, drought resistant and high-yielding varieties of different crops. With the success of crop demonstrations the farmers are gradually giving up the primitive method

of cultivation and taking two crops with residual moisture in rainfed areas and three crops in irrigated areas. Farmers' training camps are also being organised to acquaint them with all the aspects of scientific agriculture.

In order to help the cultivators to take to improved agricultural practices, cash loans under Agriculturists Loan Act and Land Improvement Loan Act are regularly given to deserving tenants. The Agriculturists Loan Act was intended to help the farmers in purchasing seeds or cattle or for any other purpose connected with agriculture. Later this loan was also advanced for rebuilding of the cultivator's house damaged or destroyed by flood. Land improvement loan is advanced for any work which adds to the letting value of land. The land improvement work includes construction of wells, tanks and other works for storage of water, preparation of land for irrigation, reclamation of land for agricultural purpose, etc.

Amount of loan given under these acts during last 5 years is given below :—

Year		L. I. Act (In rupees)	A. L. Act (In rupees)
(1)		(2)	(3)
1973-74	..	4,15,500	3,90,000
1974-75	..	45,000	3,95,000
1975-76	26,00,000
1976-77	51,540
1977-78	..	70,000	1,00,000

Agricultural shows and exhibitions that were being conducted regularly in different places of the district in the past have not yet been given up. In addition, farmers' training programmes, both in the field and in camps, are now being conducted by the Agriculture Department to educate the cultivators in advanced methods of scientific cultivation with improved seeds, implements and fertilisers. Multiple cropping demonstrations in farmers' fields have created a good impact on the Agriculturists. Crop competitions in paddy, wheat, oil-seeds and pulses are conducted every year and prizes are awarded to successful farmers.

AGRICULTURAL EXHIBITIONS AND SHOWS

Agriculture in the district is not mechanised. The age-old wooden plough, leveller, spade, sickle and several other implements to suit to the local conditions of soil and crop are in use. The country plough is the most commonly used implement. In areas where shifting cultivation is done the land is usually prepared with the help of spades and other primitive implements.

AGRICULTURAL IMPLEMENTS

The plains of the district are inhabited by a number of big and progressive farmers who have introduced mechanisation in farming. Most of these cultivators possess tractors. The use of pump sets is also gaining popularity. During 1977 there were about 500 pump sets in use and the number of tractors registered in the district was 206, out of which 195 belonged to private persons.

The district has a tractorisation unit of the State Government. In 1977-78 there were 12 tractors under the scheme stationed at different centres in the district and were hired out to farmers. The unit also demonstrates the use of various improved agricultural implements in different places to popularise their use amongst the cultivators. The Agricultural implements are also sold to the farmers.

Servicing facilities for agricultural implements are inadequate and are almost absent in rural areas. The State Government maintains a Zonal Service Station at Bhawanipatna which attends to the servicing and repairing needs of tractors. The private dealers dealing in different types of pump sets have their own servicing units.

The number of various agricultural implements in use in the district in 1972 is given below :—

Wooden plough	..	1,41,058
Iron plough	..	3,321
Sugarcane crushers (Bullock driven)	..	1,354
Sugarcane crushers (Power driven)	..	1,276
Carts (Bullock driven)	..	43,359
Oil engines	..	98
Electric pumps and pumps for tube-wells	..	32
Tractors	..	217
Oil Crushers (Ghani)	..	452

ROTATION OF CROPS

Paddy, ragi, maize, jowar, jute, mesta, vegetables, chilli, groundnut, etc., are mostly grown in the Kharif season. Crops usually grown in the Rabi season are wheat, winter paddy, oil seeds, potato, tobacco, onion, garlic, coriander and some varieties of pulses. Generally only one crop is now being grown in the Kharif season. There is hardly any second crop. Area under multiple cropping is also limited. In the irrigated areas, paddy is followed by a second crop usually of pulses or oil-seeds. In other areas, paddy is the sole crop of the year. Absence of assured water-supply has considerable impact on the district. In the unirrigated areas, crop pattern is hardly diversified and a second crop is seldom grown. Yet another method of increasing Agricultural production is to introduce rational cropping patterns which are best suited to the local conditions. Such patterns have been developed for the district by the State Agriculture

Source—Statistical Abstract of Orissa, 1973.

Department and during the past few years demonstrations have been conducted in cultivators' fields under various schemes. Such demonstrations have a good impact on the cultivators and create initiative for intensive cultivation. Gradually the farmers are adopting double cropping, multiple cropping, mixed cropping, inter cropping and relay cropping practices. These diversified and rotational methods of improved cultivation with high-yielding seeds have helped the cultivators to bear the loss from failure of a particular crop.

Traditionally the cultivators take care for the production of quality seeds and seedlings. After harvesting the crop is dried thoroughly and then threshed. It is further dried in the sun for a few days and then stored. Leaves of some indigenous plants and also ash are mixed with the seeds as a precaution against pest attack. During recent years increased attention is being given to the quality of seeds and seedlings for better production and to maintain the quality of the high-yielding varieties. The nucleus seeds are generally supplied by the Agriculture Department and also by the Seed Corporation of India. Previously the tribal farmers did not pay much attention to the quality of seeds. However, of late, the use of improved seeds, especially of ragi and paddy, are gaining popularity among them. To attract large number of small and marginal farmers to the new production technology of short duration and drought-resistant varieties of paddy, millets, oil-seeds and pulses, mini kits were supplied to farmers as seed packets during 1975-76 and 1976-77 Kharif season. This proved a success and the farmers have evinced interest in the cultivation of short duration varieties of paddy, mung, biri, ragi, etc.

SEEDS

Quantity of seeds supplied to the cultivators by the Agriculture Department in 1977-78 is given below :

Category of Seeds	Quantity supplied (in Quintals)
Paddy (high-yielding)	838.30
Maize	12.84
Jower	4.43
Ragi	34.08
Mung	57.86
Biri	69.85
Arhar	4.64
Cowpea	1.80
Groundnut	19.51
Til	3.91
Sunflower	4.00
Cotton	43.07
Mesta	3.02

Continued—

Category of Seeds	Quantity Supplied (in Quintals).
Dhaincha (Green manure)	1 25
Bajra	0·14
Sataria (Kangu)	0·35
Wheat	483·07
Bengal gram	88·99
Field pea	79·93
Lentil	1·45
Safflower	7·55
Mustard	120·93
Linseed	4·54
Sunhemp	8·00
Potato	19·00
Onion	0·68

Source—Statistical Abstract of Orissa, 1973

MANURES
AND
FERTILISERS

Cowdung still remains the principal manure. The farmers dump cowdung, refuses of the cattle-shed and other left-overs from the crop which form the farmyard manure. Oil-cake and silt of old tanks are also applied in the fields. With the efforts of the Agriculture Department the local cultivators are gradually adopting compost as a substitute for farmyard manure. In 1976-77, 5,06,110 tonnes of compost were prepared in the district. Green manuring of paddy fields is also becoming popular. An area of 12,063 hectares was green manured with sunhemp and *daincha* in 1976-77. Those who take to shifting cultivation burn the vegetations on the fields and the ash thus obtained is spread over the soil to fertilise the field.

The use of chemical fertilisers is largely confined to the progressive farmers mostly in Bhawanipatna, Lanjigarh, Dharamgarh and Jayapatna *tahsils*, who are also the highest consumers of chemical fertilisers in the district. But due to the high cost of the fertilisers, and comparatively less area being under improved seeds and crops, their application has not been adequate. Another set-back of extensive use of chemical fertilisers is want of sufficient irrigation facilities.

Generally nitrogenous, phosphatic and potassic fertilisers are used. Consumption of chemical fertilisers in the district during last 3 years is given below—

Year	Nitrogenous (in Qtls.)	Phosphatic (in Qtls.)	Potassic (in Qtls.)
1974-75	226·275	38·476	31·551
1975-76	287·949	55·689	53·254
1976-77	272·040	92·504	53·450

There are a number of diseases and pests that cause considerable damage to crops. To add to this, damage is also caused by wild bug, case worm, rice hispa, jessids, blast, blight, etc. *Pyrilla purpusila* is the common pest found in the sugarcane and it is also affected by stem borer and top shoot borer. Potato is affected by early and late blight. Besides, grasshoppers, caterpillars, fungi and virus cause a lot of damage to different crops. In 1977 due to severe attack of pests like swarming caterpillars, hairy caterpillars and cut worms in some parts of the district in epidemic form there was severe loss to major crops like paddy.

Use of modern insecticides and fungicides were unknown to the cultivators in the past. A number of superstitious practices were followed by the people to ward off the pest and crop diseases. Leaves, barks and ash of some indigenous plants with very bitter taste and smell are still used to prevent pests while storing grains.

With wide propoganda and also demonstrations the Agriculture Department has been able to impress upon the cultivators the efficacy of the modern techniques of agricultural practices. Gradually the people are adopting scientific methods to control pests and crop diseases. Sufficient stocks of pesticides and plant protection equipments are being maintained at district headquarters and Community Development Blocks to ensure timely supply to the farmers. Some farmers also have their own sprayers and dusters. There is a provision of 25 per cent subsidy to supply sprayers to the farmers through the Agro-Industries Corporation, a State Government undertaking.

The Agriculture Department of the State Government maintains three seed multiplication farms located at Arakabahali (near Bhawani-patna), Khariar and Nawapara. The Arakabahali seed farm was started in 1954 and the other two farms were established in 1960. Seeds produced in these farms are supplied to the cultivators after scientific tests. High-yielding and improved paddy, wheat, pulses, oil-seeds, maize, vegetables, cotton, etc. are generally produced. Besides the production of seeds, these farms also conduct demonstrations of improved methods of cultivation. The quantity of seeds of different important crops multiplied during 1976-77 is given below

Name of Crop		Production (in quintals)
Paddy	..	1033.35
Jower	..	6.24
Castor	..	93.40
Maize	..	7.50
Arhar	..	2.70
Ragi	..	8.84
Biri	..	43.52
Mung	..	3.42

NATURAL
CALAMITIES

The rainfall in the district is normally adequate for a fairly good Kharif crop and light crops in the Rabi season. But long breaks of monsoon during the rainy season and wide variations in the quantum of rainfall from year to year have caused frequent failure of crops. Almost the entire district is drought-prone, but areas frequently susceptible to drought conditions are the entire Nawapara *tahsil*, Lanjigarh, Madanpur-Rampur and Narla blocks in Lanjigarh *tahsil* and Golamunda block in Dharamgarh *tahsil*. Partial failure of crops in the remaining areas is reported almost every year.¹ Unlike the coastal districts of the State, Kalahandi falls outside the cyclonic tract. Cyclones in their severity are rather rare. The district except some river-side areas of Nawapara and Dharamgarh *tahsil* is free from floods.

No adequate records are available to throw light on the calamities visiting the ex-State of Kalahandi in old times. Famine reports of Chhatisgarh of which Khariar ex-Jamindari (now Nawapara sub-division) formed a part till 1936 speak of the condition prevalent in that area in the following terms.

Food Scarci-
ty 1868

The monsoon did not break in time. The paddy crop received a major set back. Kodo crop had a good harvest and it could meet the food requirements of a section of people. Relief centres were opened to supply food to needy people.

Famine of
1897

Partial failure of Rabi and Kharif crops was a recurrent feature for about three years beginning from 1884, culminating in the disastrous famine of 1897. Excessive rains, but untimely fall had their deterrent effects on crops. Government opened relief centres and provided works of public utility for employment of the wage earners. Loans were advanced to the cultivators under the Agriculturists Loan Act. Effects of this famine on the prices of commodities was disastrous and the cost of living went very high. The average price of rice in Chhatisgarh was $7\frac{1}{2}$ seers (about 7kg.) per rupee. After May, 1897, death-rate rose to 81 per mille. Birth-rate fell considerably. The officers who were in the administration at that time had no previous experience to tackle the famine situation and were unable to prevent the heavy loss of human lives.

¹ A study for determining the rainfall cycle in Balangir District was undertaken by the Bureau of Statistics and Economics, Orissa, on the suggestion of Dr. Pranakrushna Parija, Ex-Vice-Cancellor, Utkal University. The statistical analysis of rainfall in respect of Titilagarh observatory has found place in the Balangir District Gazetteer (1968). The conclusions also apply to the entire area of south Kalahandi from Khariar to Jonk. It shows that there is a year of drought every three or four years

Famine of
1899

Again in 1899, there were irregular showers. The tanks also did not retain sufficient water for irrigation. Consequently crops failed. The Deputy Commissioner of Raipur reported that there was complete and absolute failure of both autumn and spring harvests in 1899-1900. The Government started road construction work to provide employment to labourers. A number of irrigation tanks were excavated. Earth work and collection of ballast for the Raipur-Dhamtari feeder line and the proposed Raipur-Visakhapatnam railway line were carried on (the latter railway was actually opened in 1928). Free kitchens were opened in villages. People were given doles. Initially the people were hesitant to accept food in those centres for fear of being declared out-castes. This apprehension could hold them back only for a few days. After some days of painful starvation people flocked to free kitchens in considerable numbers. About 42 per cent of the total population of Chhatisgarh received such doles. The effects of the famine were of a magnitude unprecedented in any previous famines. About 7,07,000 people (about 45 per cent) received all kinds of relief. Land revenue to the tune of Rs. 8,50,000 had to be suspended. The ex-Zamindar of Khariar spent about Rs. 8,000 on relief work and maintained nine kitchens throughout the famine period. He also advanced to tenants loans of Rs. 30,000 for purchase of seeds.

Famine of
1919-20

In 1902-03, there was again scarcity but of a lesser severity. Another famine visited the Kalahandi ex-State and Khariar region in 1919. As an aftermath of the First World War the general economic condition of the people had deteriorated. It went still worse with this scarcity. There was cessation of rainfall from 13th September 1918, though from May the total rainfall (71.07) had been ample and well distributed. Except early variety of paddy, all other crops, namely *mandia*, the staple foodgrain of the poor tribals, *rasi* an important item of export, *mung*, *biri*, and *kandol* suffered seriously during the drought, profiteering and unauthorised export aggravated the situation. Though measures like provision of *taccavi* loans and supply of foodgrains from stocks of previous harvests were taken up, people suffered greatly. Prices of food-stuffs shot up. The brunt of high prices fell heavily on the poor people. A virulent type of cholera came in continuation of the distress caused by influenza epidemic and food scarcity of 1918 and raised the death-rate to about 80 per mille in 1919. Food scarcity led to malnutrition and some deaths also occurred due to starvation in 1920.

There were partial scarcities in 1922-23, 1925-26, and 1929-30 due to drought conditions and the rivers of the district were in floods during 1927 resulting in local distress.

Drought of
1954-55

In 1954 except for failure of rains in the early part of the season, it was more or less adequate except in certain small pockets. The whole of Nawapara subdivision was affected by drought where the yield was less than 50 per cent. In other areas it was 50 to 60 per cent.

In 1955 there was scanty rain in the early part of the season. Though the sowing operation could not be made in time, the paddy crop could not grow up due to scanty rain. Timely reploughing operation could not be made and there was delay in transplantation. There was satisfactory rainfall in the last part of the year, i.e., in September, 1955. This rain could not help the early variety of paddy crop. The outturn of late variety of paddy crop was also not satisfactory as reploughing and transplantation operation could not be done in time. The condition of crop especially in Bhawanipatna subdivision was rather unsatisfactory. Taking the normal yield to be 75 per cent, the failure of crops in Bhawanipatna subdivision was about 40 per cent, in Nawapara subdivision about 30 per cent and in Dharamgarh subdivision about 20 per cent. In certain pockets, however, the loss was more.

All possible relief measures were taken by the State Government by providing employment to the affected people. Eleven mid-day meal centres were opened in the district and about 1,000 children attended these centres daily. Loans in cash and kind (in shape of seeds) were advanced to the cultivators to raise a second crop to make good the loss as far as possible and the collection of land revenue was suspended.

Drought of
1965-66

During 1965-66 this district was severely affected by drought as never before, especially in the Nawapara subdivision. Due to scanty rainfall in the months of June, August and October in 1965, the Kharif paddy crop was very severely affected. The drought was responsible for the loss of nearly 3/4th of the total crop production. The effect was so severe that its impact continued to be felt during 1966-67 also. The drought was apprehended in August, 1965 itself and to meet the situation as also to combat its after effects various measures were taken by Government immediately. The bulk of the population which constituted the landless agricultural labourers became unemployed due to suspension of all sorts of agricultural operations. The worst sufferers were the landed gentry, who because of the drought could not reap a harvest nor could they take to manual labour to which they were never accustomed. The pastures lost the greenary and the bovine population therefore were equally starved. Everywhere there was an acute shortage of water. All these presented a complex problem for the district.

As a measure of providing employment to the people a net work of labour intensive schemes and test relief works were taken up even in the remotest corners of the district which provided employment to 106,722 persons. During 1965-66 to 1966-67 a total amount of Rs. 57,12,000 was spent in the district in executing different test relief works, etc., and Rs. 1,37,01,300 was given as loan under the Agriculturists' Loan Act and Land Improvement Loan Act. Gratuitous relief centres were opened in 228 places. Free kitchens were opened from July, 1966 both by the State Government and also by the philanthropic organisations and the benevolent members of the public.

The Rotary Club of Bhubaneswar collected Rs. 20,000 from Rotary Clubs of Europe and gave it to Rama Devi's relief organisation which was working in Kalahandi at that time. Rama Devi collected 12 destitute children and brought them to Satyabhamapur in Cuttack district where some of them may still be there. One of the children was given away in marriage for which the Rotary Club of Bhubaneswar gave her a wedding present. Red Cross and CARE had quite large scale relief camps in Khariar, milk-feeding was also undertaken by the UNICEF.

In 1977 this district experienced an unprecedented flood due to sudden and heavy rainfall from the 9th to 13th of September. The rainfall in and around Bhawanipatna which is normally a drought stricken area experienced 275 mm., on the 12th September against the normal rainfall of 220.9 mm., for this month in the Kalahandi district. The extent of precipitation in about 24 hours was more than the month's rainfall and about 1/5 th of the annual rainfall. Such heavy precipitation caused extensive damage and havoc disrupting life and communication for a couple of days, bringing acute suffering to the people. Almost all the rivers of the district including the Tel, the Sunder and their tributaries were in high spate. A number of minor irrigation projects, bridges and culverts were washed away. The newly constructed bridge over river Tel on Balangir-Bhawanipatna road was also severely damaged. Roads at many places were submerged under water disrupting communication and causing serious damage to the roads. 389 villages covering an area of 69,606 hectares and a population of 1.62 lakhs were affected by this flood. Crops worth rupees 104.16 lakhs were damaged in an area of 11,828 hectares. Twenty human lives were lost in the calamity.

Flood of
1977

Immediately after this severe flood there was extensive outbreak of swarming caterpillars. In Kalahandi about 8,741 hectares were affected by these pests. Prior instructions had been issued to the field officers against the impending pest attack. Immediate action was taken when pests appeared. When the pest attack became more

extensive, the Director, Agricultural Aviation, New Delhi and the Plant Protection Adviser, Government of India, were contacted to send their air-crafts for undertaking aerial spraying. Four air-crafts operated in the area from the Utkala air-strip and the Belpada air-strip. Control measures with ground equipments were also undertaken to check further spread of these pests. There was a substantial crop loss due to the pest attack, some farmers lost their Kharif crop completely while many harvested the premature crop to avoid total loss. Vigorous efforts were made to encourage farmers to raise a second crop to compensate the losses on account of floods and pest epidemics.

Necessary relief measures were undertaken to provide food and employment to the people.

ANIMAL HUSBANDRY

Live-stock development in the district is almost neglected. In a largely agrarian society like that of the district, people can supplement their income by rearing live-stock and developing dairy farming. But very rarely this has been undertaken by the local people as a commercial proposition. Cattle rearing is prevalent among the local people, but only on a domestic scale. Dairy farms have not developed mostly due to the lack of demand for milk and milk products and the problems of marketing. Domestic poultry farming is prevalent widely among the Scheduled Castes and the tribal communities. Birds and eggs are sold by the local people in weekly markets. Due to lack of market and transport difficulties, poultry farming is not developing on a commercial basis. Piggery is also widely prevalent mainly among the Scheduled Castes and the Scheduled Tribes. Pig meat is a favourite food of the local tribals and Harijans. Goats and sheep are reared for table purpose.

The live-stock population (according to Live stock Census, 1972) are given below :

Cattle	..	619,985
Buffaloes	..	157,741
Goats	..	175,688
Sheep	..	151,334
Pigs	..	20,370
Horses and Ponies	..	2,751
Mules	..	688
Donkeys	..	191
Poultry	..	743,729

Animal Feed

The pastures and grazing grounds available in the district are not sufficient for all categories of animals to graze for the whole year. There are extensive areas of forests and waste lands and plenty of green grass for the cattle to graze during the rains. Every village has its own pasture (*gochar*). Acute shortage of green grass is felt after the rains and the animals remain underfed during the summer months depending mostly on paddy straw.

To substitute the shortage of natural pasture, fodder cultivation has been taken up throughout the district. During 1977 fodder cultivation was taken up in about 45 hectares by 151 persons. The seeds of maize, cowpea, barseem and M. P. Chari along with fodder roots were supplied by the Veterinary Department to the cultivators. Besides, fodder cultivation was also undertaken in some forest lands of the district by the Forest Department. During 1978, a number of Grama Pachayats had taken up fodder cultivation in the village pastures with Dinanath grass for multiplication and for future expansion to other areas of the localities. A departmental fodder farm with an area of 44.20 hectares has been established in this district to supply fodder to the cattle of the dairy farm.

Agricultural by-products like rice bran, wheat bran, edible oil-cakes and pulses like biri and kulthi are also used as cattle feed. Premixed cattle and poultry feeds are marketed by the Orissa Agro-Industries Corporation, a State Government undertaking.

There were 72,570 milch cows and 19,522 milch buffaloes in this district according to 1972 Live-stock Census. Milk yield of the local cows is very meagre and they remain dry for most part of the year. Generally the cows are neglected and preference is given to bullocks because of their utility in agriculture. Till recently no systematic attention was given by the local people for improved breeds.

Milk-Supply

There is a live-stock breeding-cum-dairy farm at Bhawanipatna. Started in 1968, the farm was previously stationed at Balangir due to lack of accommodation in the district. It was shifted to Bhawanipatna in 1974. There are 136 heads of cattle in the farm including 45 cows. The cattle belong to Haryana breed. They are being upgraded with Jersey breed. In an average about 130 liters of milk is produced daily which is marketed in Bhawanipatna town.

Being a drought-prone area, the district is suitable for the development of live-stock and dairy which will help the poor cultivators economically. During recent years steps are being taken by the Government through various development projects to develop dairy farming on a commercial basis. Six Primary Milk Producers' Co-operative

Societies have been registered in the Community Development Block areas of Bhawanipatna, Kesinga, Komna and Nawapara. At present they are handling about 60 litres of milk daily due to limited scope in the local markets. There is ample prospect of this industry in future when it will be possible to supply milk to bigger markets in an organised manner. Besides these milk unions, 54 cows have been supplied to the small and marginal farmers of the district for the production of milk for profit. Both the schemes of the single-cow unit and the milk union are subsidised by the Government. It has been experniced that the estabiishment of milk unions and consequent appearance of an assured market for milk, creates among the farmers an incentive for the adoption of measures to improve milk yiled.

Cattle Breeding

The local breeds of cattle are generally stunted in growth and are poor in quality. Bullocks and buffaloes are employed in ploughing and pulling carts. Cows and she-buffaloes are maintained for milk purpose. This district is the habitat of a local type of milch breed known as 'the Khariar' cattle, popularly called 'Tarbod' cattle after the village of the same name in the Nawapara subdivision. It is a small statured breed with defined medium type character of milch productivity—milk yeild being about 2 kg. per day. Generally it is reddish grey in colour with a white star or blaze on the forehead. If properly maintained, a cow of this breed is capable of yielding 4 to 5 litres of milk per day. This breed was selected for research by the Indian Council of Agricultural Research.

For last 20 years the State Government is implementting various schemes for the creation of graded cattle of improved progeny, particularly cross-breed animals of exotic species and high yielding varieties. The breeding is done both by natural process and by artificial insemination. In the beginning artificial insemination was abandoned for some time due to lack of enthusiasm among the local people.

During past few decades steps were being taken to improve the local breeds of cattle by cross-breeding with Haryana and Red Sindhi bulls and Murrah buffaloes. During recent years Jersey breed has been introduced in the district. There are at present a net work of 45 artificial insemination sub-centres and 14 natural srvice bull centres in the district. A semen collection centre with 10 Jersey bulls was started in the dairy farm campus at Bhawanipatna in 1975. It supplies semen to the artificial sub-centres functioning in different veterinary dispensaries and live-stock aid centres. The Utkal Gomangala Samiti maintains 28 bull centres for natural breeding with Haryana, Red Sindhi and Jersey bulls. For the upgradation of buffaloes steps have been taken to introduce the Surti breed in the district. This breed has been obtained from Gujarat.

The goats, sheep and pigs are reared only for meat. The climatic condition of the district is not congenial to the woolly breed of sheep. The local breed of goat yield very little milk, barely sufficient for their kids.

Sheep,
Goats and
Pigs

For the upgradation of the local breed of goats a few Betal bucks were supplied to some Grama Panchayats in the past. Presently 100 Kalinga bucks have been procured for distribution among the small and marginal farmers of the district for cross-breeding. During the last two years 65 improved bucks were supplied to the tribals and the Scheduled Castes people in the Community Development Block areas of Thuamul-Rampur and Madanpur-Rampur.

No systematic steps were taken for the upgradation of the local sheep. Recently 20 cross-bred corredable rams have been procured for cross-breeding.

Twelve numbers of crossbred medium Yorkshire boars have been procured and supplied to the people in Thuamul-Rampur and Lanjigarh areas of the district.

Poultry keeping is widely prevalent among the Scheduled Tribes and the Scheduled Castes people of the district. The local breed is extremely hardy and requires no special care for rearing. Besides, these birds collect their own food. Being shy layers, these small statured birds are mainly used for table purpose. The people in some areas of the district have got duck rearing practice.

Poultry

In order to improve the local breed by cross-breeding with improved species and also to attract the people of the district for keeping poultry for profit, various schemes are being undertaken by the Government. Pullets, cockrels, hatching eggs, etc. are being supplied to the people by the Veterinary Department. There is a hundred-bird poultry unit at Bhawanipatna started under the All-India Poultry Development Scheme and two such units have been established at Kesinga and Khariar. All these units maintain the white Leg Horn breed.

To help the local people in marketing their poultry and eggs two poultry co-operative societies have been registered recently in the district. One of these societies has been assisted with an amount of Rs. 1,500/- as working capital.

Cattle shows are organised regularly by the Animal Husbandry Department to encourage people to possess exotic breeds. Each year, during the observation of the Gosambardhana week cattle shows are organised at different centres of the district.

Cattle Shows
and Fairs

Cattle
Markets

Transaction of cattle of the local breed takes place in the weekly markets at Bhawanipatna, Utkela, Dharamgarh, Junagarh, Khariar Road, Khariar and Bhanpur where bullocks are mainly transacted.

Cattle and
Poultry
Disease

The common contagious diseases of the cattle in the district are rinderpest, haemorrhagic septicaemia, black quarters, anthrax and foot and mouth disease. Besides, the cattle suffer from diseases caused by different parasites. Haemorrhagic septicaemic and black-quarter generally occur during rainy season. A large number of cattle are infected by foot and mouth diseases. Although cases of mortality are few, it causes a great economic loss to the farmers because when affected the bullocks become incapable for work and agriculture is handicapped. Common poultry diseases are ranikhet and fowl pox.

Both curative and preventive measures are undertaken by the technical staff of the Veterinary Department stationed at different veterinary institutions in the district. Being an inter-state border district, check-posts have been established at Chhilpa and Khariar Road and Nawapara to vaccinate the cattle imported from outside the State. The costly vaccine of the foot and mouth disease is given only to the graded animals free of cost.

Table below shows the number of cases treated by the Veterinary institutions along with the numbers vaccinated during 1976-77.

Number of cases treated	..	4,52,861
Number of vaccinations done against—		
Rinderpest	..	26,246
Haemorrhagic Septicaemia	..	3,65,214
Black quarter	..	1,66,922
Anthrax	..	6,466
Foot and mouth disease	..	238
R. Ov.	..	40,814
Fowl pox	..	18,583
Others	..	442

Veterinary
Institutions

There are 3 veterinary hospitals in the district, one at the district headquarters, and the other two located in the Dharamgarh and Nawapara subdivisions. Besides, there are 19 dispensaries, three minor veterinary dispensaries and sixty live-stock aid centres functioning in different parts of the district.

The district has a number of hill streams and important rivers which are the natural sources of fish supply in the district. Besides these streams and rivers, a water area of 6097.41 hectares is available from tanks under different Grama Panchayats. The irrigation projects of the district have also created a water area of 648.71 hectares. Although the district has immense potentialities for the development of inland fishery, it has not yet become an important source of subsidiary income to the local people. Pisciculture has been taken up in some Grama Panchayat tanks covering an area of 752.31 hectares only. In addition, some private persons have taken up pisciculture in their own tanks.

About 40,000 kg. of inland fish produced annually in the district is consumed internally. In addition to this, a similar quantity of marine fish (both fresh and dried) is imported from the Ganjam district of Orissa and from Waltair and Vizianagram in Andhra Pradesh.

The Fisheries Department of the State Government have started fry supply centres in different parts of the district located at Bhawanipatna, Bhatrajore, Baldiamal, Koksara, Khariar and Nawapara. Fish breeding is conducted at Bhawanipatna, Bhatrajore and Koksara. The fish farms consist of some nursery tanks, rearing tanks and stocking tanks. The centres are the source of supply of fry. Prior to 1954-55, when rearing of fry was not being carried out in the district fingerlings were being procured from outside for distribution. At present about 30 lakhs of fry are being supplied by the Fisheries Department to different Grama Panchayats and private pisciculturists. In each subdivision a Fisheries Extension Officer has been posted to render technical advice to the pisciculturists.

The Fisheries Department is giving demonstrations for the production of quality spawn by induced breeding technique, adopting modern scientific methods. The commercial Banks are also giving loans to private pisciculturists for the renovation of derelict tanks for development of pisciculture.

There are a number of fisherman families in the district who fish from rivers, tanks and swamps and sell them in local markets. Fishery is an important source of livelihood of a number of people living on the banks of the rivers Tel and Indravati in Dharamgarh, Nawapara and Jayapatna *tahsils*. The population of fishermen is quite negligible in the district. According to 1961 Census only 454 persons were engaged in fishing. Traditional fishing implements like nets, bamboo traps and angling rods are in common use in the district.

FOREST

Kalahandi district is noted for its rich forests which cover nearly 40 per cent of its total geographical area. In 1977, it extended over an area of about 4,775 sq. km. (including the forest of Kashipur *tahsil* of Koraput district). The forest comprises 1,734 sq. km. of reserved, 2,482 sq. km. of demarcated and 559 sq. km. of undemarcated protected forests.

The most important forest produce are firewood, timber, bamboo and Kendu leaf. Bamboos of excellent quality are the predominant products in the forest tracts in Lanjigarh and Bhawanipatna *tahsils*. Teak, Sal, Piasal, Sisua, Sahaj, Bija, Jamun, Mohua, etc. are the main timber species found in the district with Sal predominating. There was a time when teak was abundant. Khariar is the only area within the State of Orissa which forms a part of the natural teak belt of Madhya Pradesh, and once it owned some of the best teak. But due to reckless felling by the contractors engaged by the ex-Zamindari, the valuable timber species have practically disappeared. The method of exploitation of large timber was being carried on by contract system and the contractors were given the monopoly to fell trees above a certain girth (according to C. P. L. R. Act, 1917, it was 4 feet). The forests being worked by the contractors in this way for years and unworthy people being recruited to the Estate forest staff, the bulk of it now contains a few or no large timber of value. Teak was also found in many village lands and in the forest areas in the valley of the Tel river. Bulk of the teak has also disappeared in an orgy of destruction which followed the granting to villagers of the right to trees standing on their own holdings during 1948. Nawa-para *tahsil* is still noted for good quality teak wood.

Firewood, timber and bamboos are exported in large quantities outside the district. Kendu leaves possess a good market both inside the country and abroad.

Other forest products are myrobalans, broom-grass, lac, Mohua flowers and seeds, Antia bark, Sabai grass, catachu, tamarind, arrowroot, honey, hide, horn, etc.

Forest
Revenue

Unrestricted and irregular felling done in the past was responsible for rapid deterioration of forest in the district. Destruction of vegetation by burning forest areas in shifting cultivation is still a common practice by the poor tribal cultivators of the hilly tracts. Scientific exploitation has been introduced to preserve the forest to meet the growing demand of the people and to obtain substantial revenue for the State exchequer.

The following statement shows the revenue earned from the forest during 1976-77:—

<u>Sources</u>		<u>Revenue (in rupees)</u>
Timber	..	58,34,422
Firewood	..	6,39,037
Bamboos	..	9,35,486
Kendu leaves	..	56,22,447
Minor Forest Produce	..	6,87,727
Other sources	..	3,86,218

Although the district is rich in forest resources, especially in respect of some important products like good quality timber, bamboos and Kendu leaves, the impact of forest on the economy of the district is not very significant. Some of the forest based industries like saw mills, carpentry units, etc. have sprung up in the district, but a major portion of the timber is sent out of the district either in the form of logs or sawn timber. Bamboos are exported from the district to feed paper mills established in some other districts of the State. The local people get some employment in plucking the Kendu leaves which are exported outside the State. A large number of small breweries have, however, come into existence in the district which use Mohua flowers for the preparation of country liquor. Forests have provided some subsidiary sources of income to the local people. Collection of minor forest products, picking of kendu leaves, and cutting of timber and bamboo are some of the important subsidiary occupations. A large number of local inhabitants fall back upon numerous species of fruits and roots obtained from the forest as their main source of subsistence. Forest products also constitute an important item of export of the district.

APPENDIX I

Area, Production and Yield Rate of different crops for the agricultural year 1976-77 *

Sl. No.	Crop	Area (in hectares)	Production (in tonnes)	Yield rate (Quintals per hectare)
(1)	(2)	(3)	(4)	(5)
1	Rice	259,800	169,560	10·0
2	Wheat	3,198	4,098	12·8
3	Ragi	26,621	10,950	4·1
4	Maize	14,319	9,404	6·6
5	Jowar	5,123	3,237	6·3
6	Bajra	364	166	4·6
7	Small Millets	56,816	19,342	3·4
	<i>Total—Cereals</i>	366,241	216,757	5·9
8	Tur	9,639	4,146	4·3
9	Gram	6,930	2,668	3·8
10	Mung	18,052	6,768	3·7
11	Biri	21,334	7,660	3·6
12	Kulthi	11,510	3,116	2·7
13	Cowpea	1,568	584	3·7
14	Field pea	12,254	3,676	3·0
15	Other Kharif pulses	500	100	2·0
16	Other Rabi pulses	8,849	2,491	2·8
	<i>Total—pulses</i>	90,636	31,209	3·4
17	Groundnut	3,145	3,418	10·9
18	Til	12,497	4,860	3·9
19	Castor	6,524	2,858	4·4
20	Mustard	10,224	4,930	4·8
21	Linseed	8,555	3,167	3·7
22	Nizer	2,707	548	2·1
23	Sunflower	338	101	3·0
24	Safflower	451	180	4·0
	<i>Total—Oil-seeds</i>	44,441	20,062	4·5

Continued

APPENDIX I

Area, Production and Yield Rate of different crop for the agricultural year 1976-77

Sl. No.	Crop	Area (in hectares)	Production (in tonnes)	Yield rate (Quintals per hectare)
(1)	(2)	(3)	(4)	(5)
25	Potato ..	37	157	42.4
26	Sweet potato ..	5,579	25,470	45.6
27	Onion ..	5,164	21,122	40.9
28	Other (Kharif) vegetables ..	10,476	45,794	43.7
29	Other (Rabi) vegetables ..	11,509	54,258	47.1
	<i>Total—Vegetables</i> ..	32,765	146,801	44.8
30	Chillies ..	7,119	2,517	3.5
31	Corriender ..	723	202	2.8
32	Garlic ..	157	55	3.5
33	Ginger ..	133	47	3.5
34	Turmeric ..	279	188	6.7
	<i>Total—Condiments and spices..</i>	8,411	3,009	3.6
35	Mango ..	760	3,800	..
36	Banana ..	225	2,908	..
37	Citrus ..	412	4,150	..
38	Papaya ..	100	420	..
39	Coconut ..	180	40	..
40	Cashew nut ..	40	12	..
41	Other fruits ..	240	625	..
	<i>Total—Fruits</i> ..	1,795	..	.
42	Jute† ..	40	267	6.7
43	Mesta† ..	3,484	11,614	3.3
44	Sunhemp † ..	426	1,065	2.5
45	Cotton† ..	670	650	0.9
46	Tobacco ..	2,215	746	3.4
47	Sugarcane ..	4,600	32,040	70.0

* . SOURCE—Director of Agriculture and Food Production, Orissa.

† . Production and yield rates in bales of 180 kgs. each.