CHAPTER IV

AGRICULTURE AND IRRIGATION

The district is broadly divided into two divisions, the coastal plain areas in the east and the hills and tableland in the west (Agency tracts). The Eastern Ghats run along the western side of the district and at places it approaches near about 36 km. from the sea in the east. The plains lies between the Eastern Ghats and the Bay of Bengal. Since the hills are close to the sea, the rivers flowing from the hills are not very long and are subjected to sudden floods. The narrowness of the plains area is mainly due to the absence of the big rivers in the district. The coastal plains in the east contains more fertile and irrigated lands. Towards the centre and south, it is hilly with beautiful well-watered valleys. The south-eastern portion of the district is fertile. The extreme north-east of the district is occupied by a portion of the famous Chilika lake. The immediate vicinity of the lake though good for fishery and salt-manufacture is not suitable for good cultivation.

The principal crops of the district are paddy, Ragi, Mung, Biri, Til, groundnut, Kulthi, sugarcane and chillies. Usually paddy is sown by way of broad-casting on rainfed high lands and transplanted on irrigated and rainfed medium and low lands. Next to paddy, Ragi is the most important crop. It is grown 2 to 3 times during a year. Sugarcane is grown in and around Asika and Paralakhemundi abundantly. During Rabi season Mung and Biri are grown in large areas. Groundnut is grown both during the Kharif and Rabi seasons.

According to the agricultural statistics of 1985-86 the total geographical area of the district comes to 8 per cent of the total geographical area of the state. Total net area sown of the district was 4,80,000 hectares during 1986-87, out of which 278.10 thousand hectares were irrigated and the rest 201.90 thousand hectares had to depend upon rainfall.

LAND UTILISATION

The total geographical area of the district was 2,20,000 hectares in 1986-87 of which the total cultivated area was 4,82,000 hectares. Forests covered 5,89,000 hectares. Towards the centre and the south, it is hilly with beautiful well-watered valleys running towards the sea. The south-eastern portion is fertile and contains extensive multi-cropped areas well served by many irrigation

projects. The Agency tracts, inhabited mostly by Kandhas and Saoras, consist of networks of hills and forests. The area under cultivation in these parts is comparatively small.

The statement below gives a picture of land utilisation in the district in the year 1986-87.[1]

	(Area in 000, hectares)
Total geographical area[2] ..	12,20
Net area sown ..	4,80
Forests ..	5,89
Misc. tree crops not included in net area sown ..	38
Permanent pastures and other grazing lands. ..	38
Cultural wastes ..	5
Land put to non-agricultural uses ..	60
Barren unculturable land ..	3
Current fallows ..	2
Other fallows ..	5

Land Reclamation

Wastelands are leased out every year to landless persons particularly Scheduled Castes/Scheduled Tribes according to the priority prescribed under the Orissa Government Land Settlement Act. Government provide subsidy for land reclamation as part of the government policy to encourage people to cultivate wastelands. During the year 1982-83 and 1983-84 the Soil Conservation Department reclaimed 12·96 hectares of land and distributed those among 36 beneficiaries of Scheduled Castes and Scheduled Tribes.

Assistance for land development, reclamation and improvement is also given under the Integrated Rural Development Programme (I. R. D. P.). The statement below shows figures relating to the amount of assistance given and the number of beneficiaries assisted under this programme from 1984-85 to 1988-89.:

1. Directorate of Agriculture and Food Production, Orissa.
2. According to 1981 Census the geographical area of the district is 1231 sq. Km.

Year	No. of beneficiaries assisted	Subsidy (Rs. in lakhs)	Loan (Rs) in lakhs
(1)	(2)	(3)	(4)
1984-85 ..	33	0·21	0·45
1985-86 ..	30	0·18	0·38
1986-87 ..	66	0·44	0·90
1987-88 ..	56	0·30	0·62
1988-89 ..	73	0·33	0·68

Under the Land Development Programme, financial assistance is also given to the Small and Marginal farmers. The statement below shows the amount of assistance given and the number of beneficiaries assisted from 1983-84 to 1987-88 :

Year	Amount spent (in lakhs)	No. of beneficiaries assisted
(1)	(2)	(3)
1983-84 ..	2·90	1,447
1984-85 ..	2·66	642
1985-86 ..	N.A.	N. A.
1986-87 ..	32·12	3,255 (through 45 water harvesting structures).
1987-88 ..	13·24	1,903 (through 16 water harvesting structures).

SOIL CONSERVATION

The district has alluvial soil in the eastern part, red-laterite soil in the west and black cotton soil at the centre. Majority of areas of the district are hilly and undulating. In the hilly areas tribals practise shifting cultivation which results in serious soil erosion for lack of vegetative cover. Majority of the up lands are cultivated

without bunds. As a result, sheet erosion is acute in the cultivated lands. On account of sheet erosion top soil gets removed resulting in poor yield from such cultivated lands. In the coastal plains, wind erosion is a major problem. Vast stretches of sterile sands are blown away to the cultivated lands making them unproductive. In the undulating terrain fertile lands need protection from gully erosion. In order to tackle the soil erosion problem in the district some soil conservation measures are being taken by the Soil Conservation Department in the problem areas on watershed basis. In the coastal areas, large scale cashewnut and cocoanut plantations have been taken up to stabilise the coastal sand-dunes so that drifting of loose sand to the adjoining agriculture lands is minimised. Extensive cashew plantation has also been taken up on bald hill slopes and wastelands so as to provide vegetative cover by Soil Conservation and Forest Departments. The Forest Department has taken up extensive casuarina plantation under shelter belt afforestation scheme to mitigate the effects of cyclone and soil erosion. Construction of soil conservation engineering structures have been taken up to stabilize some eroded banks. Private farmers have been assisted to take up cashew plantation on their own lands with subsidy so as to popularise the plantation programme among the farmers. Commercial crops like coffee, pineapple and pepper have also been introduced in the Agency Area of the district. The work done by the Soil Conservation Department is shown in the preceeding paragraph.

In the district cashew plantation has been taken up over 4114·8 hectares. In addition, 3067·875 hectares also have been planted by the farmers in their own land with subsidy provided by the Soil Conservation Department. In the coastal sand-dunes, 3628·8 hectares cocoanut plantation has been done as mixed crop with cashewnut. Coffee has been planted as an experimental measure in hilly areas covering 36·855 hectares only. Pepper has been cultivated in 1·62 hectares using shade plants in the coffee plantation as standard. Pineapple has been grown in 2·835 hectares. Pastureland covering 80 acres has been developed to provide fodder to the local people. Eroded stream bank extending over 5 km. has been protected by suitable conservation measures. Farmer's up-land, subjected to sheet erosion, has been protected by land development work over an area of 1798·2 hectares. Gullies in the cultivated lands have been stabilised by construction of 93 units of gully control measures. Perennial and semi-perennial streams flowing in the farm lands have been harnassed by construction of 50 units of water harvesting structures and 17 nos. of farm ponds. Such conservation engineering structures not only improve the water regime of the area, but also provide supplemental irrigation to the adjoining cultivated land during drought period. From 1983-84 a new scheme, namely,

Rural Landless Employment Guarantee Programme, is being implemented with a view to provide employment to the rural unemployed and underemployed labourers. Under this scheme 45 numbers of water harvesting structures have been constructed. A Soil Conservaton Demonstration Centre covering 56·7 hectares has been established at Chandiput in Mohana Community Development Block to demonstrate different soil conservation measures and cropping programmes. New plantation crops like guava, coffee, pepper, pineapple and hill banana have been introduced in the hilly region taking advantage of the suitable agro-climatic condition. Local tribal farmers are supplied planting materials for growing in their own land. A pasture development centre extending over 16·2 hectares has been established at Nalabanta near Asika to cultivate grass and legume on eroded land. Nearby cultivators are supplied planting materials to grow green grass in their own land.

Impact of Soil Conservation on Agriculture

Land development programme like bunding and terracing has helped farmers in regular cultivation of uplands reducing the fallow period . Crop cutting trial has indicated additional yield of 15 to 25 per cent due to conservation measures. Water harvesting structure has prevented sand-cast in the cultivated land, besides protecting crops during drought period. Cashew plantation has been useful in providing remunerative return to the farmers. Most of the soil conservation measures are implemented by engaging human labour and thus this programme has generated employment for the rural mass. Coastal plantation has proved useful in preventing sand drifting to adjoining cultivated lands.

IRRIGATION

Rainfall in the district is confined mainly to four rainy months from June to September. During the remaining months, water requirements are met from ground or surface water resources. Therefore, these resources are very important for the development of agriculture.

The chief sources of irrigation constitutes the wells, tube-wells and canals in the district. The geographical area of the district as stated earlier, is 12.20 thousand hectares. The cultivated area of this district is 4,82,000 hectares. In 1986-87 the gross area irrigated by different sources was 278·10 thousand hectares (or 57·6 %) which is 11 per cent of the state average. The area irrigated from different sources are given over leaf.[1]

1. Orissa Agriculture Statistics, 1986-87.

(Irrigated area in 000'hectares)

		Kharif	Rabi
1. Major and Medium	..	101·17	3·39
2. Minor(flow)	..	105·59	..
3. Minor(lift)	..	17·91	10·74
4. Other Sources	..	22·90	16·40
Total	..	247·57+30·53=278·10	

Till mid-nineteenth centuty the main irrigation sources in the district were the river channels. Besides, the larger irrigation works of note were the Boiri Reservoir, south-west of Gangpur in the then Ghumusar Taluk, and the Karatoli *tampara* in the then Brahmapur Taluk fed by a branch of the Ghodahada river. In Paralakhemundi ex-estate, the Gajapati rulers excavated some fine tanks of large size which still supply water for irrigation.

Major Irrigation Projects

The Rushikulya Canal System

The Na'-anka famine of 1866 which claimed thousands of lives, drew the attention of the British Government to take up an irrigation project for the benefit of the people of the district. Accordingly, Major Buckly, the Resident Engineer, was entrusted with the work of preparing a project report in 1868. Major Buckly took up the Rushikulya, the life-line river of the district , for the purpose and submitted his report in 1872 for proper utilisation of its water. It took more than ten years to the Government to approve the project. Ultimately, the work was started in 1884 at an estimated cost of Rs.28·60 lakhs. However, the cost was revised to Rs.43·16 lakhs and the project was completed in 1902. Initially, the Rushikulya Project aimed at irrigating 1,03,324(41,814 hectares) acres of land in Kharif and 4,000(1,619 hectares) acres of land in Rabi.

This is the only major irrigation project in the district which came into existence during pre-independence days. Now this project is providing irrigation to a certified ayacut of 61,233 hectares during khariff only. The canal system consists of 2 reservoirs at Bhanjanagar (Russelkonda) and Sorada with capacity of 61 m. cum. and 35 m. cum. respectively. There are anicuts in different tributaries and leading channels to interlink each other for convenience of irrigation. The Gallery channel taking off from the Gallery river by an anicut at

Sorismuli is the main source of supply to the Russelkonda reservoir. This channel has got independent *ayacut* of about 1620 hectares. Then the head sluice channel from the Russelkonda reservoir drops water into the Boinga Nullah and this water reaches the Ghumusar anicut at Madhaborida where the Mahanadi canal and the Girisola channel take off. The Mahanadi and Girisola canals irrigate about 3,644 hectares and 3,239 hectares respectively. The Mahanadi canal then joins the Rushikulya river above Janivilly anicut. In the right of this anicut the main Rushikulya canal takes off to irrigate about 37,247 hectares. The Sorada reservoir mainly feeds the Rushikulya canal which has a catchment of about 512 sq.km. and drops regulated water to the Rushikulya river through Johoronallah to be finally picked up at Janivilly anicut to supply through the Rushikulya canal.

As this is an old project, an amount of Rs.1·27 crores has been estimated to modernise the above system to provide additional irrigation to 2170 hectares.

Areas benefited by the above major project in different Tahasils of the district are given below:

Name of Tahasils	Certified Areas in (hectare) up to 1985-86
Asika	12,171·08
Bhanjanagar	2,668·61
Buguda	1,431·54
Digapahandi	4,682·79
Purusottampur	10,298·16
Kanasi	10,464·63
Brahmapur	12,785·60
Chhatrapur	6,730·92
Total ..	61,233·33 hectares

Medium Irrigation Project

Jayamangal Irrigation Project

The Jayamangal Medium Irrigation Project provides irrigation facilities to an area of 7349·98 hectares during Khariff only in different Tahasils as detailed below :

Name of Tahasil	Certified area in hectares ending 1985-86.
1. Chhatrapur	3780·72
2. Purusottampur	3569·26
Total ..	7349.98 hectares

Salia Irrigation Project

The Salia Irrigation Project is a reservoir scheme constructed across the river Salia about 22 km. from Balugan on the National Highway No. 5 along the Balugan-Pratap road. The scheme consists of 424 m. long and 30 m. high earth dam and spill-way of 99 m. long. The project provides irrigation to a certified *ayacut* of 2005·85 hectares in Khallikot Tahasil of Ganjam district. Besides the above one, an area of 6317·71 hectares is also benefited by this project in Banpur Tahasil of Puri district. The cost of the project was Rs.3·89 crores.

Bahuda Irrigation Project

This is a reservoir scheme across the river Bahuda. The construction work of this project was commenced during 1959. The project was started with an aim to construct 5 diversion weirs as follows :

1. Weir across river Bahuda at Kalingadala
2. Weir across Bogi at Surangi
3. Weir across river Poichandia at Badagada
4. Weir across river Batarada at Badulia
5. Weir across river Bahuda at Turubudi

As per original proposal the project was to irrigate 3458·295 hectares of Khariff crop. There was also a proposal for construction of one reservoir project at Beghalati in Bahuda basin to supplement water to weirs at Badagad, Turubudi and Badulia, and another reservoir project over Bagi at Salabhaga Pentha to supplement water to the weir at Bagi in Stage II of the Bahuda Project Irrigation scheme. After 7 years of irrigation, the proposal was revised by extending the Kalingadala left main canal and dropping the construction of Turubudi and Badulia weirs.

This scheme which was constructed at an estimated cost of Rs. 1.59 crores, now provides irrigation to an area of 7738.89 hectares during Khariff in Digapahandi (442·10 hectares) and Chikiti (7,296·79 hectares) Tahasils.

Baghua Stage II

This reservoir scheme is an earthen dam across the river at Karadabadi. The estimated cost of the project which was commenced during 1978-79 is Rs. 7·99 crores. On completion, the project will provide irrigation to an area of 3070 hectares for Khariff and 1,310 hectares for Rabi in Bhanjanagar subdivision and Nayagarh subdivision (Puri district). In addition, this will supplement irrigation in Rabi season on the left side.

Dhanei Irrigation Project

This is a reservoir scheme across river Dhanei. The construction work of this project was commenced during 1959 and was completed in the year 1975. The project comprises an earthen dam and uncontrolled rolled spillway. A main canal of 27·05 km. with a head discharge of 4·68 cubic ft. of water takes off from the dam of 1341 metres length. The certified ayacut up to the end of 1985-86 was 3741·20 hectares which included 3362·46 hectares of Kodala Tahasil and 378·74 hectares of Buguda Tahasil.

Baghalati Irrigation Project

Baghalati irrigation project is a medium irrigation project with 1692 metre dam and a spillway on the left abutment hill across the Baghalati river. The preliminary works of the project was commenced during 1984-85. On completion, the project will irrigate 2,800 hectares in Khariff and 880 hectares in Rabi seasons.

Hiradharbati Irrigation Project

Previously a small pocket near Purusottampur was getting irrigation from an innundation channel (known as Hiradharbati channel with a head sluice constructed during the close of last century) on the left bank of the Rushikulya river near Hanumanpalli. It was subsequently felt to provide assured irrigation to commandable area of 69 square kilometres upto Chilika canal. Investigation was started in the year 1939. The main feature of the project is a diversion weir across the Rushikulya at Hanumanpalli with a canal tailing at the National Highway, near Humma. This project provides irrigation facilities to an area of 7189·49 hectares which included 3864·74 hectares of Purusottampur Tahasil, 1231·60 hectares of Chhatrapur Tahasil and 622·15 hectares of Khallikot Tahasil of the district.

Baghua-Stage I Project

The Baghua Stage I project, the construction of which was started in 1969 and completed in 1978 consists of a diversion weir at the downstream of village Biranchipur. The Baghua left main canal is linked with the Nalakanla innundation canal near the village Sunaribuguda. The project provided irrigation to an area of 2,885·52 hectares during Khariff in 1985-86. The above area included 2450·80 hectares of Kodala Tahasil and 434·72 hectares of Buguda Tahasil.

Ghodahada Irrigation Project (1962—78)

The Ghodahada Irrigation Project is a reservoir project with an earthen dam near village Burudanga about 21 km. from Digapahandi across the river Ghodahada. The construction of this project commenced in 1962 and completed in 1978. The spillway

of the project is located in the saddle on the right. The head regulator is located in the left side of the river, before the earth dam. After running a very short length, the main canal branches to the right and left. The right main canal crosses Ghodahada river and lies to right side of the river. The project now provides irrigation to a certified ayacut of 6268·97 hectares during Khariff in Digapahandi Tahasil.

Ramanadi Irrigation Project—Stage I

Ramanadi Irrigation Project is a medium project which aims at development of the vast unirrigated lands in Digapahandi Tahasil. In stage I, the project envisages diversion weir, across Ramanadi at Badapada . The main canal has been planned keeping in view its future expansion. Now the project provides irrigation to a certified ayacut of 1321·38 hectares during Kharif in Digapahandi Tahasil.

Daha Irrigation Project

The project is located on the Daha and the Kalinga rivers, 16 kilometres north-west of Bhanjanagar town. The Daha and Kalinga rivers are tributaries of the Loharakhandi river in the Rushikulya basin. The construction of the project started during 1974-75 and completed during 1984-85. It consists of 3,370 metres long and 19·30 metres high earth dam, and 73 metres long spillway on right side. The Daha main canal takes off from the head regulator on right sides with designed discharge of 6·17 cusecs to provide irrigation facilities to 4,580 hectares in Kharif and 2,285 hectares during Rabi season The project was providing irrigation to a certified ayacut of 1926·73 hectares in Kharif season in Bhanjanagar (1833·86 ha.) and Asika (92.87 ha.) Tahasils upto 1985-86.

Harabhangi Irrigation Project

The Harabhangi Irrigation Project is a part of the integrated plan for development of the Vamsadhara and the Rushikulya basins. This project envisages harnessing of the water resources of the Harabhangi river, a tributary of the Vamsadhara which is an inter-state river flowing through Andhra Pradesh and Orissa. According to an agreement reached between the two States regarding utilisation of water resources of the Vamsadhara basin, Orissa is entitled to utilise 50 per cent of the water available upto Gotta barrage. The Harbhangi project is one of the medium projects of Orissa to utilise its share of water. This is a reservoir project with an earth dam 744 m. long and 44m. high situated at about 6km. north-west of Adaba village in Ganjam district. Its 99m. long spillway, and 110 m. long earthen dyke are on the right side. The water from the reservoir will be diverted into the Padma river through an open cut of 2670 metres length and 2190 metres under-tunnel and to be

picked up at the weir near Gokulpur through a canal. The canal on the right bank of the weir with a head discharge of 11·7 cusecs will run for a length of 2·50 km. and will be bifurcated into the right and left distributaries. The right distributary with a head discharge of 8·50 cusecs will have a length of about 20·20 km. and will serve an area of 7050 hectares through a distribution system of 97·30 km. (excluding water courses). The left distributary with a head discharge of 3·2 cusecs is about 14·1 km. long and will have a distribution system of about 37·7 km. (excluding water courses) for an area of 2,600 hectares. The project is a World Bank assisted scheme.

New Project

The State Government have a prospective plan to take up the following projects in a phased manner to provide irrigation benefits to some more areas of the district. The details are given below :

Sl. No.	Name of the Project	C. C. A. (,000 ha.)	Community Development Blocks to be benefited
(1)	(2)	(3)	(4)
1	Chheliagarh ..	10·400	Digapahandi, Sanakhemundi
2	Rushikulya dam ..	7·000	Sorada, Belaguntha, Buguda.
3	Loharakhandi ..	3·500	Bhanjanagar
4	Bontha ..	2·000	Jagannath Prasad
5	Menibhadra ..	8·000	Asika, Kodala, Khallikot, Ganjam, Kabisuryanagar and Purusottampur.
6	Lower Harabhangi ..	8·000	Dharakot, Seragarh
7	Budhanadi Dam ..	3·400	Bhanjanagar
8	Barg-Salki Burtang ..	10·000	Polasara
9	Mahendra Tanaya ..	5·000	Rayagada, Paralakhemundi, Kashinagar.
10	Badajora ..	2·200	R.Udayagiri
11	Neradi Barrage ..	3·500	Kashinagar

Lift Irrigation

The district mostly comes under hard rock terrain. There is a narrow strip of alluvial formation along the river Rushikulya and its tributaries. The alluvial tract is ideally suitable for open wells and shallow and filter point tube-wells. There is also scope for construction of open wells and dug-cum-bore wells in some rocky area by tapping the ground water reserved in weathered rocks.

It has been assessed through preliminary phase of ground water survey that about 800 shallow tube-wells, 93,000 standard open wells and 730 filter point tube-wells can be installed in this district and 21,900 hectares can be served through direct lift irrigation projects from different rivers.

The Orissa Lift Irrigation Corporation is in charge of installation of public tube-wells and river lift projects. By the end of 1987-88, 1016 lift irrigation projects have been installed in different parts of the district. The area commanded by these projects is about 19,100 hectares (C.C.A.).

Minor Irrigation

The programme of minor irrigation has been taken up in the district through construction of small diversion weirs and reservoirs. There are 1,516 minor irrigation projects whose designed ayacut is 1,26,087·43 hectares in Khariff and 10,469.25 hectares in Rabi season. Out of this, 981 are completed projects, the designed ayacut of which comes to 81,704·295 hectares in Kharif and 6,688·575 hectares in Rabi. 100 projects are completely derelict with designed ayacut of 4,615.38 hectares of Kharif and 151·875 hectares of Rabi. There are also 431 projects partly derelict with 37,870·21 hectares Khariff and 2,596·05 hectares of Rabi ayacut. Four new projects are under construction whose designed ayacut is 1907·55 hectares Kharif and 627·75 hectares of Rabi. Besides this, irrigation is projected to 215·46 hectares of ayacut located in Andhra Pradesh from 12 joint irrigation sources situated in Paralakhemundi subdivision which form a part of the total 1,516 minor irrigation projects.

The total water wealth so far harnessed have been utilised in 29 Community Development Blocks under 14 Tahasils of the district through 829 km. main canals and about 555 km. distributaries.

SOIL

The district has mainly four varieties of soils, i. e., saline soil along the coast., vast area of alluvial soils behind the saline strip, laterite soil in the western and northern part and black soils in the central part, i. e., in Rushikulya system.

Saline soil is found in the sea coast, around Chilika, and in the eastern part of Humma, Ganjam, Chhatrapur. Locally the saline soil is called "Luni Mati". During the rains crops are cultivated but in summer it remains dry due to salt concentration.

Alluvial soil has its coverage of about 30·35 per cent of district area in Rushikulya system. It is highly suitable for cultivation of rice, wheat, sugar cane, pulses, patato and vegetable. Besides, cocoanut, cashewnut, guava and mango are also grown.

The laterite soils are found extensively from western part of Brahmapur to Paralakhemundi, Ramgiri, Mohana, Taptapani and up to Digapahandi. This type of soils are mainly under forest crops.

Black cotton soil locally called "Kali Mati" consists of clay mixed with lime concretions. Ordinary Khalia is black clay with alkaline reaction but does not possess lime concretion. Such soils are found in Digapahandi, Asika belt. It is suitable for cultivation of crops like sugarcane, pulses and paddy.

Red loam soils are normally found on the pediment in the district. These are acidic soils and need amendment with rock phosphate, paper mills sludge and basic sludge treatment.

CROPS IMPLEMENTS, SEEDS, MANURES, FARMS

The principal crops of the district are paddy, ragi, Mung, Biri, til, groundnut, Kuluthi, sugar cane and chillies. The important fruit crops are cocoanut, mango, cashew-nut and banana. People of the district have taken up double and multiple cropping in a more extensive scale than those of other districts of the state.

Paddy

Paddy is the staple crop of the district. The quality of paddy produced in the district is very fine. The earlier the season, the better is the harvest to raise a second crop. Usually paddy is sown by way of broadcasting on rainfed high lands and transplanted on irrigated and rainfed medium and low lands. The three varieties of paddy, i. e., autumn, winter and summer are grown in the district. The autumn paddy is sown in May and harvested in October. The winter paddy, grown in low lands, is sown in May and June and is harvested in November-December. Cultivation of Dalua or summer paddy is also popular. Its yield is about 50 per cent more than the winter rice due

to low incident of pest and diseases. During Kharif, the weather remains cloudy in most of the days. So the availability of solar energy for photo-synthesis is less in Kharif season than in summer season. It is obvious that this simple factor would greatly influence the productivity of paddy in summer season. The other associated factors like use of high yielding seeds, input management, and pest management are better organised during summer than in Kharif which reflects the higher yield during summer. The popular summer paddy varieties are Bala, Annapurna, Kaberi, Pusa-2-21, Ratna, Jaya, I. R.-8 and Kumar-all high yielding varieties. Besides, other improved varieties like P. T. B.-10, M. T. U.-15 are also grown. In 1987-88, the area under paddy was 289 thousand hectares. High yielding Kharif 232·40 thousand hectare, Rabi 4·09 thousand hectares and traditional variety 52·51 thousand hectares and production was 539.000 metric tonnes, the average yield rate being 18·53 quintals of rice per hectare which is rather low.

Ragi

Next to paddy, ragi is the most important cereal corp. It is grown both in Kharif and Rabi seasons. The area under ragi was 67·92 thousands hectares during the 1987-88, the production being 74·00 thousands tonnes and the yield rate being 10.8 quintals per hectare. Improved varieties of ragi are AKP-2 and Dibyasingha. The latter variety has been released by the Orissa University of Agriculture and Technology Bhubaneswar.

Other oereals

Maize is the most important cereal grown both in Kharif and Rabi seasons. The area under maize was 13·24 thousand hectares during the 1987-88, the production being 13·65 thousand tonnes and the yield rate was 0·97 tonne per hectare. An area of 6·39 thousand hectares is put under high yielding maize. The Tibetan refugees in Chandragiri Agency grow maize extensively as it is their staple food crop.

Pulses

Green gram(Mung), black gram (Biri), Kulthi are the main pulses grown in this district. In 1987-88, a total area of 138·71 thousand hectares were under cultivation of different pulses and 90·329 thousand tonnes were produced with an average yield rate of 0·26 tonnes per hectare. Among the pulses, *mung* and *biri* are the most important crops in the district. Mung and *biri* are grown both in Kharif and Rabi seasons. Mung is sown in October and December and harvested in January. In the year 1987-88, *mung* was sown over an area of 153·26 thousand hectares and the total

production was 61·31 thousand tonnes with an average yield of 0·4 tonnes per hectare. The area under *biri* cultivation in 1987-88 was 59·58 thousand hectares and the total production was 23·83 thousand tonnes with an average yield of 0·4 tonnes per hectare. Kulthi is grown only in Rabi season. Kulthi was cultivated in 40·89 thousand hectares in 1987-88 and the total production was 16·32 thousand tonnes with an average yield of 0·4 tonnes per hectare.

Oil-seeds

Groundnut and *til* are the major oil-seeds cultivated in the district. Among minor crops, mention may be made of mustard, niger, castor, sunflower, and safflower. During 1987-88, the total area brought under oil-seeds cultivation was 111·30 thousand hectares and the production was 93·49 thousand tonnes. The yield rate was 8·4 tonnes per hectare. Groundnut was the most important oil-seed which covered 55·14 thousand hectares in 1987-88 and the production was 55·70 thousand tonnes. The yield rate was 0·98 tonnes per hectare. Til was cultivated in 34·59 thousand hectares and the yield rate was 2·35 tonnes per hectare.

Cotton

During the year 1987-88 cotton cultivation covered an area of 0·68 thousand hectares and 0·54 bales* were produced with an avervge yield rate of one bale per hectare.

Mesta

Mesta cultivation covered an area of 2·91 thousand hectares in 1987-88 and the total output was 14·30 thousand bales. The yield rate was 5·00 bales per hectare.

Sugar-cane

The most profitable crop in the district is sugar-cane and the quality of the cane is excellent. Sugar-cane is grown in and around Asika, Polasara and Paralakhemundi abundantly. The co-operative sugar factory at Asika encourages extensive cultivation of sugar-cane by giving subsidy and loan to the cultivators. The crop requires loamy soil and is grown generally on lands close to a village or within easy reach of canal irrigation. It also grows on the edge of natural water courses. It demands more care and attention than any other crop and also requires more time, labour and money. The field has to be ploughed some twenty time and richly manured before the cuttings are planted in January or February. Then constant irrigation is necessary, and the soil has to be loosened and oil cakes are applied to the roots. These processes are repeated at intervals, the land being

*. 1 bale = 170 Kg. of units for cotton

irrigated so as to keep it continually moist and after the fourth application of fertiliser in May or June, land is weeded and loosened. The steams are then wrapped in sugar cane leaves and tied up. After another weeding in August the leaves are bound together and the plants are tied together tightly to provide required strength to resist the storms. Finally between December and February, the canes, after reaching maturity, are cut and mostly the cuts are sent to nearby Asika and Paralakhemundi. From there these cuts are sent to different places of the district for making of sugar and molasses. During the year 1987-88 there were 8·35 thousand hectares under this crop with an average yield of 70 tonnes per hectare and the production was 5·05 tonnes per hectare.

Different types of vegetables are grown in Kharif and Rabi seasons in this district. Among the main vegetables cultivated during Kharif and Rabi seasons, mention may be made of potato, brinjal, pumpkin, onion, garlic, cabbage, cauli-flower, sweet potato, chillies and *potal*. During 1987-88 there were 50·75 thousand hectares of land under cultivation of different vegetables and the production was to the tune of 307·89 thousand tonnes with an average yield of 60·66 quintals per hectare. Cultivation of potato was negligible. During 1987-88 it covered an area of only 1.20 thousand hectares with an average yield of 68·25 quintals per hectare. Sweet potato was grown over an area of 3·91 thousand hectares during 1987-88 and the production was 24·28 thousand tonnes with an average yield of 62·07 quintals per hectare.

Condiments and spices

Chilli, coriander, garlic, ginger, onion and turmeric are the main condiments and spices grown in this district; chilli being the most important. This crop covered an area of 6·97 thousand hectares in 1987-88 and the production was 4·83 thousand tonnes with an average yield of 6·94 quintals per hectare. Onion was grown over an area of 0·90 thousand hectares during this year and the production was 7·55 thousand tonnes with an average yield rate of 8·38 quintals per hectare. Corriander covered an area of 0·55 thousand hectares, garlic 0·40 thousand hectares, ginger 0·40 thousand hectares and turmeric 0·63 thousand hectares. During 1987-88, there were 9·97 thousand hectares of land under cultivation of different condiments and spices and the production was 8·87 thousand tonnes with an average yield of 8·49 quintals per hectare.

Tobacco

Tobacco was grown on a very small area during the year 1987-88 which was to the extent of 0·22 thousand hectares only. The production was 0·17 thousand tonnes with an average yield of 0·05 tonnes per hectare.

Fruits

Fruits including citrus variety and mango, banana, papaya, cocoanut, etc., are popularly grown by the people.

During 1985-86, 9,212 hectares were under mango cultivation and the production was 16,200 metric tonnes. Banana was cultivated in 1,295 hectares and the production was 13,350 metric tonnes. Citrus variety covered an area of 1,300 hectares followed by papaya, 261 hectares. Cocoanut plantation covered an area of 4,308 hectares during 1985-86. The total production was 23,090 thousand nuts of cocoanut.

Progress of Scientific Agriculture

Since agriculture is the main occupation of the people in this district, attention has been given for introduction of scientific agriculture practices for higher production. Paddy is the principal crop followed by ragi, pulses and oil-seeds. Improved seeds, fertilisers and pesticides are made avilable to cultivators. High-yielding and short-duration varieties of crops are also introduced. Cultivators are gradually taking to adopt improved methods of cultivation and make use of better seeds, manures and implements.

The use of tractors, power-tillers and pumps is increasing. Other plant protection implements like sprayers and dusters are being used by the farmers for applying insecticides. The traditional wooden ploughs have been replaced by iron ploughs in many places. Demonstrations in the cultivators' field are being conducted by the Agriculture department to convince them about the modern method of farming. The farmers are also given incentive for follow-up action and are encouraged through crop competetiion.

Agricultural implements

Country made age-old agricultural implements like ladder, spade, sickle and several other big or small implements are in use. But gradually the farmers are becoming conscious about the utility of the improved agricultural implements. However, the wide use of such implements like tractors etc., is not possible in the district due to many unfavourable conditions like scattered condition of holdings, hilly areas, poverty of the farmers, etc. There are 228 tractors registered up to 31st March, 1984 in the district, out of which 27 tractors are used by the Government and 201 tractors are privately owned.

The number of agricultural implements used in the district during 1977 were as follows.*

* Source—1977 Cattle Census.

Name of the Agricultural Implements		Number
Wooden ploughs	..	1,89,000
Iron ploughs	..	2,103
Sugar-cane crusher	..	563
Carts	..	12,621
Oil engine with pump sets	..	255
Electric pump sets for irrigation	..	67
Ghannies	..	174

Improved machinery

Bullocks are still considered the main source of power for agricultural operation. Emphasis has, therefore, been given for the use of improved agricultural implements, which are developed to suit the need of the farmers. These implements are labour-saving devices, efficient enough to bring more returns to the cultivator. Use of such implements are demonstrated to the farmers in their fields and are made available to them. To encourage them, these implements are provided at subsidised rates. The following table shows number of demonstrations conducted and implements supplied (in Rs.) from 1982 to 1985.

	1982-83	1983-84	1984-85 (up to January 1985)
Demonstrations conducted	481	500	404
Implements supplied (Rs.)	76,190	67,440	80,516

The use of improved implements is slowly gaining popularity among the farmers. Farmers with resources and big holdings are given expert technical advice regarding their selection and use. So pucca Kothis have been constructed for storage of grains by the farmers under the "Save grain" programme.

Another unique practice of storing of paddy in the under ground (Dhana Khani) is prevalent among the majority of farmers in this district. In this system, *khani* is generally dug in front of their houses without obstructing the common passage of the village. The depth and size of the *khani* depends upon the quantity of paddy to be stored After the earth is dug from inside the *khani*, a thick paste of cowdung is applied to the interior walls and allowed to be dried completely. Then the paddy is poured into the storage on a bed of straw and

covered with the straw ropes and earth which appears like a small mound. This *khani* is preferred commonly because it provides a cost-effective means of protection against theft, rain, fire, insects and raid of the rats. Apart from that the *khani* rice is tastier, easily digestible and so liked by the majority.

Rotation of Crops

In Rabi, rain-fed areas are mostly covered with pulses and oil-seeds. In irrigated areas (under lift irrigation points and dug-wells) vegetables, ragi, groundnut, chilli, sugarcane and pulses are taken up either as a second crop or third crop. Some examples are as follows:

(A) **Rain fed**
- (1) Paddy followed by horse gram/black gram/ green gram/ ginger/ mustard
- (2) Ragi followed by horse gram
- (3) Groundnut followed by horsegram

(B) **Irrigated**
- (1) Paddy followed by groundnut/Til/pulses/ ragi
- (2) Paddy followed by vegetables/Til/ pulses/ragi.
- (3) Paddy followed by sugar-cane/chilli
- (4) Paddy followed by groundnut

Seed and Manure

Timely supply of seeds and fertilisers ensures better yield. The District Agriculture Officers are expected to maintain quality of seeds and fertilisers.

Seed

The cultivators after harvesting, dry the crop thoroughly. Then the crop is threshed and cleaned. It is further dried in the sun for a few days and then stored. Leaves of some indigenous plants and ashes are mixed with the seeds as a precaution against pest attack. The cultivators are being advised to use quality seeds, to resort to improved method of cultivation and to store the seeds in metal storage bin. Certified seeds are supplied to few cultivators by the Agriculture Department and the National Seeds Corporation of India, according to the demand. The Agriculture Department procures seeds from the National Seeds Corporation. Orissa University of Agriculture and Technology and also through the Orissa Seeds Corporation.

Quantity of seeds supplied to the cultivators by the Agriculture Department during the year 1982-83 is given below:

Category of seeds	Quantity supplied (in quintals)
Paddy ..	3,638
Ragi ..	181
Groundnut ..	230
Wheat ..	122
Mustard ..	59
Gram ..	6
Mung ..	177
Biri ..	108
Arhar ..	45
Cotton ..	5
Field Pea ..	22
Til ..	33
Safflower ..	17

Manure and Fertilisers

Cowdung is the most important manure. Cowdung, refuses of the cattle shed and refuses from the crops form the farmyard manure. The old practice of manuring land by enfolding sheep and cattle also continues. Silt of old tanks when dried up in summer is also applied in the fields. Oil-cake is used for valuable crops like sugar-cane and vegetables. In the urban areas night soil manuring has been introduced. The street refuses and night soil are turned into compost and supplied to the cultivators at cheap rates. In the past, a strong belief existed against the use of night soil and bone-meal. Use of chemical fertiliser was almost unknown. But the picture has now changed a great deal. The cultivators have resorted to use different chemical fertilisers. The result of application of such fertilisers is also demonstrated in the Community Development Block areas. Training is being imparted to cultivators regarding improved method of compost production. Production of compost from various sources during 1982-83 is given below:

	(Figures in tonnes)
Rural Compost	11,04,580
Urban Compost ..	12,628

Among the chemical fertilisers, generally nitrogenous, phosphatic and potassic fertilisers are in use. The quantity of various chemical fertilisers consumed in the district during the year 1986-87 is given in the following table:

Kharif			Rabi			
Nitro-genous	Phos-phatic	Potassic	Nitro-genous	Phos-phatic	Potassic	Per hectare consumption of fertilisers in kg.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
9,326	1,846	880	5,772	683	526	22·6

Common pest and diseases found in this district are given below :

Name of the crop	Pests	Diseases
1. Paddy(Kharif)	Jassids, Mealy bug, Stem borer, Swarming Caterpillar, Brown plant hopper, white backed plant hopper, Gall midge, case worm, Leaf roller, Grass hopper, cut worm.	Brown spot, Blast, Bacterial leaf blight, shealth blight, False smut..
2. Paddy (Summer)	Stem borer, Brown plant hopper, white backed plant hopper, case worm, leaf worm, Grass hopper, cut worm.	Brown spot, Blast, Bacterial leaf blight.
3. Sugarcane	Stemborer, top shoot borer.	Redrof
4. Patato	Blight	..
5. Groundnut	Red hairy cutter Piller	Tikka

Name of the crop	Pests	Diseases
6. Mustard	Aphids	
7. Mung and Biri	Pod Borer	Powdery mildew
8. Arhar	Blister bettle Pod borer, Plama moth, Leaf miner, Leaf roller.	Wilt
9. Cotton	Aphids, Red Cotton and Dusky cotton bug, Leafroller	..
10. Brinjal	Top shoot-borer and fruit-borer	..

Plant Protection

Cultivators seldom take plant protection measures in their crops. Use of insecticides and fungicides were unknown to the cultivators in the past. A number of superstitious practices were being follwed by the people to ward off the pest and crop diseases. Leaves, barks and ashes of some indigenous plants with very bitter taste and smell are still being used to prevent pests while storing grains. These are at present being replaced by spraying and dusting of gamaxene, D. D. T. and other insecticides and pesticides. Scientific plant protection measures are gaining popularity because of their effective action and quick results. With wide propaganda and demonstrations the Agriculture Department has been successful to a great extent in impressing upon the cultivators on the modern techniques of agricultural practices. Gradually people are adopting scientific methods to control pests and crop diseases. Pest and disease surveillance work is being undertaken by agricultural field staff. Cultivators are also given technical advice. Insecticides and fungicides are supplied to cultivators through Community Development Block and Grama Panchayat agencies. There is provisions of free spraying of pesticides in epidemic areas. Cultivators are being supplied with sprayers and other equipments at subsidised rates. Many farmers also have their own sprayers and dusters.

Agricultural Farms

There is one large farm at Dhanei and four small farms at Bhanjanagar, Jagannathprasad, Babanpur and Golanthara. The aim of these farms is to produce quality seeds acceptable to the

farmers. These farms serve as demonstration ground for introducing new varieties and new technique of increasing production. The details of each farm are described below:

Dhanei Farm

It is a large farm situated in Polasara Community Development Block. It was established on 4th September 1965 with an area of 42·22 hectares. It gets irrigation from a medium irrigation project. This farm produces mostly certified paddy seeds during Kharif

Bhanjanagar Farm

It is a small old farm located at Bhanjanagar and was established on 1st June 1942. The farm covers an area of about 9 hectares. It is situated near the Bhanjanagar reservoir from which it gets irrigation facilities. There is a small tank inside the farm which also provides irrigation at the time of need. This farm produces only certified seeds.

Jaganathprasad Farm

It is located in Jagannathprasad Community Development Block, 2 km. away from Jagannathprasad. The farm with an area of 10·23 hectares was estabilised in 1957. There is a tank and three dug-wells inside the farm to provide irrigation to the farm. The farm produces only certified paddy seeds.

Babanpur Farm

It is located at Babanpur, nearly 4 km. from Asika. The farm was established in 1961. It has an area of 23 hectares. It gets irrigation from a minor irrigation project, 2 tanks and 5 dug-wells inside the farm. It produces mostly certified paddy seeds and a little quantity of pulses.

Golanthara Farm

It is a small and old farm established on 30th May 1958. The area of the farm is 16·26 hectares. It gets irrigation from the Rushikulya Medium Irrigation Project. It produces mostly paddy and pulse seeds. This farm also acts as Adoptive Research Station for studying the adoptivity of new varieties of seed and techniques taking into consideration the agro-climatic conditions.

Soil Testing Laboratory

A soil testing laboratory is located at Brahmapur to analyse the soil, fertiliser and compost samples and to recommend the optimum fertiliser dose for efficient management of crop husbandry. The process undertaken in the said laboratory caters to the needs of the farmers in judicious use of fertiliser.

Agricultural Exhibitions and Shows

For publicity of agricultural activities and programmes, small scale exhibitions are held at subdivisional level every year. The produce of farmers adopting scientific cultivation practices are brought and exposed to visitors with a view to encourage others to adopt similar practices for higher production.

HORTICULTURE

The activities of the horticulture organisation in the district is aimed at the development of fruits and vegetables including potato. There are four horticultural divisions in this district each headed by a horticulturist in Class II of the state cadre. The divisions are located at Brahmapur, Chhatrapur, Bhanjanagar and Paralakhemundi subdivisions. All the Horticulturists have been stationed at the subdivisional headquarters except in the case of the Horticulturist of Paralakhemundi, whose headquarters is fixed at R. Udayagiri. The above four officers are working under the supervisory control of the Deputy Director of Horticulture, Puri Range, Sakhigopal.

The agro-climatic condition of the district is most suitable and ideal for development of horticulture crops. Under the Citrus Development Scheme of the Horticulture Department, the existing plantation of 2·00 lakhs citrus plants had been maintained at Bhanjanagar, Brahmapur, Chhatrapur and R. Udayagiri during 1987-88. During 1988-89, 53,000 nos. of citrus seedlings had also been raised and distributed to the cultivators. An area of 290 hectares had also been covered during 1987-88 under citrus in the hilly regions of Mahendragiri, Ramagiri and R. Udayagiri areas. Besides, mango is grown all over the district and cocoanut is grown in the coastal zone of the district.

The Horticulture Department also supplies quality planting materials to the cultivators. During 1987-88 a total number of 1·12 lakhs of Grafts, Gooties and seedlings had been supplied to the cultivators through four transit nurseries in the district. Training on preservation and processing of fruits and vegetables to the house wives is imparted at the Canning Centre located at Brahmapur.

Under the Integrated Tribal Development Agency Schemes, 48 hectares of mixed orchards have been established and 12·00 hectares have been covered under banana cultivation at a cost of Rs. 5·91 lakhs. 124 Scheduled Tribe families have been benefited.

Under the National Rural Employment Programme mixed orchards have been established in 60 hectares and plantation has been done in 99·6 hectares. Besides, 40 hectares of old plantation are also maintained. The programme covered 308 beneficiaries.

Under the Backyard Plantation Programme, an amount of Rs, 1, 43,000/- has been spent in planting fruit plants in the backyards of 22,500 Scheduled Caste families.

Various on-going schemes are to be continued in the coming years. For the year 1989-90, schemes like Citrus Development, Fruit Development, Mango Plantation, Cocoanut Extension and Banana Development, are proposed to be continued. Under Centrally Sponsored Plan Schemes, cocoanut plantation on canal embankment will be continued. Under vegetable minikit programme, there is a target for distribution of 14,500 minikits at an expense of Rs. 2,90,000/ during the year 1989-90.

AGRICULTURE INFORMATION SERVICE

The agriculture information service is an extension education project which provides necessary training facilities to the farmers in the techniques of agriculture through different media of mass communication, viz., publications on different agricultural topics, audio-visual aids, crop campaign, radio broadcast, telecast, film shows, etc. The agricultural information service plays an important role in providing effective training materials in time for dissemination of information to the farmers in the remote rural areas.

In the district for the implementation of the agricultural extension education projects, one Training Officercs posted at Brahmapur. He works under the control of the Deputy Director of Agriculture, Brahmapur.

STATE ASSISTANCE TO AGRICULTURE

As the general condition of the farmers of the district is below the poverty line, a lot of assistance is required for the upliftment of the cultivators. For improvement of agriculture Government have implemented many special programmes in the district. For this purpose introduction of scientific agricultural practices, training and visit system has been introduced through World Bank assistance. In order to impart necessary technical guidance to the farmers Village Agricultural Workers (V. A. W.) have been appointed alongwith the Agricultural Extension Officers who supervise the work of V. A. Ws. They organise group discussions and motivate the farmers on modern method of farming besides conducting crop demonstrations and trials in different seasons. Multiple cropping pattern demonstrations are also being conducted in different types of land, both irrigated and rainfed, to educate the farmers that three or more crops can be grown in irrigated lands and two crops can be successfully taken up in rain-fed lands. Introduction of new high yielding varieties have also been taken up. The minikit containing the improved variety

seed of oil-seeds, millets and pulses are supplied to the farmers by the District Rural Development Agency (D. R. D. A.). Some special agricultural schemes implemented in the district is discussed below:

(a) Special Rice Production Programme (SRPP)

Special Rice Production Scheme is being implemented in the district in six blocks, viz. Bhanjanagar, Belaguntha, Khallikot, Purusottampur, Rangeilunda and Paralakhemundi since 1985-86. The main objective of the scheme is to increase the productivity of rice through adoption of improved technology. As per the programme 60,000 paddy kits were supplied to the farmers at nominal cost. Sale points have been opened in each block for sale of fertiliser, pesticides, sprayers, agricultural implements at 50 per cent subsidy to the farmers. Besides, pump sets and power tillers are available at subsidised rates within 4 years of implementation of the scheme. In 1988-89 the high yielding paddy coverage has been increased from 73 per cent to 86 per cent. Fertiliser consumption rate has remarkably increased. A total number of 60,000 beneficiaries have been benefited during 1988-89 under this programme.

(b) Prime Minister's Massive Programme (P. M. M. P.)

The Prime Minister's Massive Programme of assistance has been operating in the district since 1983-84. Under this programme pulse and oil-seed kits are distributed to the small and marginal farmers covering 30 per cent of Scheduled Caste and Scheduled Tribe beneficiaries. This scheme is basically a production-oriented scheme intended to alleviate poverty of small farmers and marginal farmers and to increase agriculture production. During 1988-89, 2,782 kits of seeds containing groundnut, Arhar, Ragi, Biri and Til were supplied to the farmers.

(c) National Oil-seed Development Programme (N.O.D.P.)

The National Oil-seed Development Programme was introduced in this district during the year 1984-85. The main object of the programme is to increase the production of oil-seeds through extention of cultivated area and increasing the productivity. This scheme provides opportunity to the oil-seed growers to receive inputs like seeds, fertilisers, seed treating chemicals and pesticides free of cost, besides conducting C.D. Block demonstrations. Improved seeds of groundnut, asmum, mustard, etc., are also supplied to the farmers in shape of mini kits.

(d) National Pulses Development Programme

This programme is implemented in this district since 1986-87 with the objective of increasing production and productivity of pulses. Under this programme block demonstrations are conducted

in an area of 50 hectares in a compact patch or in a contigious patch of two or three villages to put an impact on the farmers for intensive cultivation of pulse crops. The beneficiaries are being supplied minikits bag containing seeds, fertilisers and pesticides free of cost. In 1988-89, 2110 kits bag of Arhar were distributed among the farmers of the district.

(c) Cotton Development Scheme

The aim and object of the scheme is to encourage the cotton growers for adopting improved technology. In this scheme 50 per cent cost of fertiliser kits and 25 per cent cost of prophylatic spraying@ Rs. 100/- each per acre is provided by the Government to the cultivators to grow cotton. Assistance on important inputs like fertiliser and pesticides are given in shape of package. During 1988-89, 800 prophylatic kits and 800 fertiliser kits have been allotted to cotton growers of the district.

(f) Sugarcane Development Scheme

The aim of the scheme is to popularise sugarcane cultivation in a few potential blocks around the sugar factory in the district. Since the involvement of cost in sugarcane cultivation is very high and the technology is sophisticated, the farmers cannot afford to take up sugarcane cultivation, for which the cultivators have been provided seeds, fertilisers and chemicals to take up the cultivation. The inputs have been supplied to the farmers in shape of kits. The cost of one such kit is Rs. 1000/- only. In 1988-89. 30 beneficiaries have been benefited under this scheme. Beside, loans and advance are also provided to the sugarcane cultivators through the Asika Co-operative Sugar Industries of the district. A sum of Rs. 28,20,000/- has been provided as loan to 22,649 members of the society during the year 1987-88.

The scheme of advancing Taccavi loan to the cultivators for Improvement of land and for relief in periods of distress, purchase of seed or cattle or such other purposes was introduced in the state under the provisions of a Land Improvement Loans Act, 1883 and the Agriculturist Loans Act,1884. The above scheme was subsequently substituted by co-operative and Commercial Bank loans. To avoid duplication, Government ultimately decided to stop disbursement of Taccavi loan altogether since 1st April 1980 and no such loan is being sanctioned there-after. From 1980 the co-operative societies and commercial banks are giving financial assistance to the cultivators in shape of short-term, medium-term, and long-term loans for the purpose of purchasing seeds, manures, chemical

fertilisers, insecticides and weedicides, agricultural machines, land reclamation, installation of tube-wells, purchase of tractors, dairy farming, horticulture, pisciculture, etc.

The advances sanctioned by different co-operative societies and commercial banks in the last five years (1982-83 to 1986-87) is given below: —

Name of the Co-operative Societies/ Commercial Bank	Amount advanced (in lakhs)				
	1982-83	1983-84	1984-85	1985-86	1986-87
1. Primary Agricultural credit Service Societies	5.35	15.90	58.46	46.73	42.97
2. Primary Land Development Bank	164.59	155.68	128.84	121.57	145.50

Co-operative Farming Societies

A co-operative farming society is a voluntary organisation based on the ideals of self-help and mutual-aid. It is primarily intended to benefit the small farmers and landless cultivators. The members pool their lands and cultivate jointly, but the proprietorship rests with the owners. They also pool their manpower and other resources.

There are two joint farming co-operative societies in this district, viz., (1) Umasahi Joint Farming Co-operative Society and (2) Tiliki Joint Farming Co-operative Society. Both the societies started functioning in 1963. The Umasahi Joint Farming Co-operative Society situated in the Jagannathprasad Community Development Block, got its registration on 28th March, 1963. The total membership of the farm as on 30th June, 1980 was 22 and the capital of the farm was Rs. 12,375. The Tiliki Joint Co-operative Farming Society located in Bhanjanagar Community Development Block was registered on 9th January, 1963 with a total membership of 24 persons. The financial position of the society as on 30th June, 1980 was Rs.96,625 and the value of production was Rs. 10,157 only. Both the farms have not yet got any Government assistance.

Each co-operative farming has its own problems. Sometimes such farms liquidate due to strained relations among the members or for some other reasons beyond the control of the co-oprerative society.

NATURAL CALAMITIES

Natural calamities like flood, cyclone, drought, etc., have almost become an annual phenomena in the district. The economy of the district has been caught in a vicious circle of cyclone, drought, flood and tornado. Agriculture development has been severely arrested on account of these natural calamities.

The floods occur due to the sudden rise of the rivers which have their source in the hilly country to the west. Since the hills are close to the sea, the rivers flowing from the hills are not very long and thus they are subject to sudden floods. The construction of embankments on both the sides of the river causes deposit of silt in the bed and in due course, the river bed rises and the flood level also rises. In the rainy season, and especially after bursting of a storm in the hills, the water level of rivers rise to a great height in a few hours and the water rushes down with extreme violence, and causes floods. Though frequently of short duration, the floods become unmanageable. Another cause of concern for the agriculturists of this district is inundation by salt water. The tracts generally affected are those adjoining the Chilika lake. The salt water is forced up by the action of the tides and the winds, and sometimes spread for miles, over the fields. Droughts are due to the deficiency of the rainfall. Paddy is the main crop of the district and any adverse condition to the crop upsets the entire economy and causes considerable distress. Devastation by famines and scarcity due to frequent droughts and floods, have left their indelible mark in the economic life of the people. Major natural calamities which have occurred in this district are given below.

Famine of 1792

A severe famine occurred in 1792. The crops had been very scanty since 1789, and on the 7th November Crawford issued a proclamation suspending all import and transport duties on grain and other edibles in the company's Haveli lands. The famine does not seem to have extended much to the north of Ganjam, and at Puri the people lived in the midst of plenty. In the Ichhapur and Chicacole areas, however, the people died in thousands. The exportation of grain was forbidden from the sea-ports, and a guard of Sepoys was stationed at Kanchili to prevent exportations to the

south. Government seems to have done their best to mitigate the horrors of famine, but were powerless to control the evil in an efficient manner. Warricker, Assistant Collector, writes on the 15th January 1792 to Keating, the Collector at Chicacole that, "I was an eye-witness of the melancholy effects of famine. About six persons were gathered round a fire and were feeding upon the carcass of a dog killed on suspicion of its being mad[1]. A big populous village called Kodur was reduced in 1791 to only 20 souls. The tanks and wells were dried up and for want of sufficient pasturage the cattle died. The famine situation was aggravated due to failure of dry crop in 1792 and it was further damaging due to the floods that happened in the same year.

Famine of 1839

There had been bad years in 1837 and 1838, but in 1839 the season was so disastrous that the inhabitants were put to the greatest distress, and many of them emigrated whilst Cholera and other diseases carried off multitudes of those who remained. The distress was greatest in the northern Taluks of the district, but it affected all the estates in the district more or less. The south-west monsoon had been tolerably copious, but the drought that prevailed in the district after September was so severe that more than 10 per cent of the cocoanut trees withered and died from its effects.

Famine of 1865-66

Between 1865 and 1866, a famine of the most unparalleled severity desolated the country and 10,000 to 15,000 people died of actual starvation. The number of deaths reported was 10,898, but there is no doubt that the total loss of life by starvation was greatly in excess of this return, as many hundreds must have perished, of whom no account was kept. The northern part of the district suffered chiefly.

The famine of 1866 which visited the district and almost all parts of the then coastal Orissa is known as Na-anka. The famine affected whole of the district. Particularly northern part of the district was affected seriously.

The rainfall in the years 1863, 1864 and 1865 had been scanty in the whole district but especially so in the principal division where it was recorded to be 29,39, 20.44 and 18.05 inches respectively.* By September 5, 1865 when the usual

1. Ganjam District Manual, T. J. Maltby, p. 121.

* Average rainfual was 43 inches narmal.

import of rice by road from the north was found to be failing, prices had risen so that the quietness of the district was imperilled by threatened grain riots. By January matters were so strained that the Collector applied for special relief for the people to the Government, but his applications met with a curt refusal. In February he called upon the zamindars to feed their people and proposed a subscription in the district, both of which met with a ready compliance. Relief houses were opened by the various zamindars and in the Government Taluks. In March it was clear that the land was in the grip of famine. But the Government, while sanctioning a few small works, would not approve of the Chilika canal, a large work proposed to face the disaster. Things went from bad to worse and in May on being asked by the Government for a special report, the Collector recorded that a universal struggle between the poor and starvation was going on, that 200 deaths * from starvation were reported, but that of 1,543 deaths reported from Small-pox and Cholera many had been due to want and hunger, and that the raiyats preferred death to taking cooked food which in consequence of the limited means at his command, was the only form of relief, he could offer.

In May, the subscriptions, local and from Madras, were Rs. 8,700/- per mensum. Help from the Government was negligible. By this time the relief houses were so beset by starving people clamoring for food that the distribution of such food as could be afforded was made with much difficulty. On the last but one day of the month came a Government telegram of a grant of 10,000 rupees. Being awake to the urgency of the case, the Government did all that could be done to assist the people and the officials of the district. As rapidly as possible, arrangements for the relief of all who were in need of it were made. By the end of June matters had vastly improved and a further supply of Rs. 20,000 was sent from the North-West Famine Fund.

In July the excavation of the Chilika canal was started. In August the Board of Revenue sent up seed paddy at the Collector's request, and with this and the improved state of affairs, it became possible to afford relief to all cases that could be reached.

In October a further grant of rice was made by Government to the relief fund, and by the end of the month the prices began to fall and the numbers at the relief houses which were 8,000 in July fell to 6,000.

* As mentioned earlier ten to fifteen thousand people perished out of hunger.

In November the early paddy was cut and this and the imports from Cuttack and the feeding of poor classes caused an absolute glut of foodgrain in the markets.

The number of parentless children that were saved from death was 537 and they were distributed among missionaries to educate.

The cost of the famine to Government may be tabulated as follows:

		Rs.
(1) Remissions and refunds to raiyats	..	1,25,405
(2) Cost of seed grain given	..	29,000
(3) Cost of rice given to raiyats for food	..	85,000
(4) Distribution of cooked food	..	60,000
(5) Cost of works sanctioned	..	75,000

The reluctance of the better classes to take relief in the shape of cooked food was sadly apparent in the famine and a great many held out to their death.

Famine of 1988-89

There was a severe famine, in 1888-89, which combined with an extensive epidemic of Cholera, raised mortality to a high figure. Rainfall was deficient for many years. Stock of foodgrains had been totally exhausted and many people suffered from starvation. Nearly 6 lakhs of rupees were spent on relief work.

Famines of 1896-97 and 1907-08

In the years of 1896-97 and 1907-08 the rainfall was nearly half the annual rainfall. Crops totally failed. Particularly in Agency tracts there was inadequacy of rains. The people in affected areas went long distance to earn livelihood by doing earth-work. In 1908-09 also famine visited parts of Paralakhemundi zamindary and Brahmapur Taluk. The distress also spread to the villages of Savaras and Kandhas. Gratuitous relief and test relief works were started by the Government.

Famine of 1918

The crops were damaged in 1918 due to early cession of monsoon. The reserve stocks of food were badly depleted due to successively bad harvests caused by excessive rainfall in 1914, 1915, 1917 and very irregular rainfall in 1918. The devastating epidemic of influenza broke out in July and reached its climax towards the end of the year. Many people died due to starvation.

Famine of 1919

Ghumusar, Kodala and Chhatrapur Taluks were affected by famine in 1919. Considerable number of deaths caused by influenza, combined with famine, forced large scale emigration to Burma.

After 1919 the district had not seen any remarkable calamities till 1933. In 1933 the district was affected by a severe cyclone. After that in 1938, the district was again affected by a severe cyclone and heavy rainfall. The standing crops were badly damaged and the economic condition of the people deteriorated badly. Again in 1940, due to heavy rain, high floods came in most of the rivers of the district and damaged crops severely.

In the vear 1941 there was not sufficient rain in the district. The dry spell continued for the whole of the year and the crops were totally damaged in the Taluks like Ghumusar, Asika, Brahmapur and Chhatrapur. In the next year i. e., 1942, a severe cyclone passed over the district in the month of November. In its effects crops were damaged and many houses collapsed. In 1944 there was also heavy rain in the district which damaged the crops badly.

Flood of 1955

There was an incessant and heavy rainfall in the catchment areas continuing for one week in the month of September 1955. This created unprecedented flood in the principal rivers of the district. The flood-water overflowed the banks of the rivers. Almost all the rivers of the district were in high flood and before reaching the sea they swept the district. High floods of the river Rushikulya and its tributaries affected 187 villages. 54,056 persons were affected by the floods and 13,972 acres of cultivated land were damaged by flood water. The total damage of crops was estimated Rs. 3,22,076.

Drought of 1965-66

Due to constant failure of crops, the district suffered crop-loss over 60 per cent during 1965-66. 130 villages suffered crop-loss over 75 per cent and 298 villages sustained crop-loss between 50 per cent to 75 per cent.

In order to cope with the situation, funds under different heads were utilised for drought relief purpose. The following funds were utilised for the purpose.

		Rupees
(1) Agricultural loans	..	1,83,000·00
(2) Land Improvement loans	..	5,00,000·00
(3) Rural Works Programme	..	2,59,790·00
(4) Diging of wells	..	2,37,500·00
(5) Test Relief	..	6,00,000·00
(6) Deepening of wells	..	15,000·00

Cyclone of 1968

A severe cyclonic storm centred in the Bay of Bengal about 250 kilometres south of Gopalpur of this district at 1.30 p. m. on the 26th October, 1968 and crossed the Orissa coast near Gopalpur at a speed of about 144 kilometres per hour. The storm was accompanied by incessant heavy rain. The unprecedented rainfall within a short period marooned several villages and took the inhabitants unawares. The rivers and streams including the Chilika lake swelled up unexpectedly and quick discharge of water into the sea was not possible due to the high tide which occurred immediately after the rains. Extensive areas remained submerged under 6 to 10 feet of water continuously for a period of a week or so. The cyclone moving at a high velocity and accompanied by torrential rains caused extensive devastation with colossal damages to life and property of the people.

Before normalcy could be restored, a second spate of cyclone accompanied by heavy rainfall swept over the area between the period from the 11th to 13th November, 1968 and caused equally severe damages to the properties of the people in the area including standing crops. The rescue operations and the relief measures which had already been taken up in the area were interrupted. The restoration work of rail and road communications and repair to private and public buildings which were in progress also suffered a serious set-back.

Worst damage was caused to the Calcutta-Madras National Highway which had been breached at 17 places between Jankia in Puri district and Golanthara near Brahmapur in Ganjam district. The railway track from Khordha to Chhatrapur was also severely damged. Widespread damage was caused to medium and minor irrigation projects, flood embankments and other public properties like electric transmission lines, telephone communication and other Government institutions and buildings.

In Brahmapur subdivision, 989 villages and 238,096 people were affected by the cyclone. In Chhatrapur subdivision 723 villages and 290,007 people were affected. The total area affected by the cyclone in the district was 1,650·11 sq. kilometres. The catastrophe took off 36 human lives in the district comprising of 18 men, 11 women and 7 children.

The cyclone which moved at a very high velocity damaged as many as 58,877 houses of the inhabitants of the affected areas of the district of which 17,121 houses had completely collapsed, 270,25 houses had partly collapsed and 21,499 houses were partly damaged.

The medium variety of paddy crop which was ready for harvest and the late varieties of paddy crop which was at a flowering stage suffered substantial loss. According to a tentative estimate, paddy crop in an area of about 71967·69 hectares had been affected. Besides, an area of about 1131·975 hectares had been sand-cast and an area of about 4837·32 hectares had been water-logged. Emergency relief in shape of dry rations like *chuda* and rice was given to the affected people for a period of three days. On account of the delay in the discharge of water from the affected areas the period was extended to 7 days and in some badly affected pockets it was further extended. House building grants were also provided to the houseless people in order to reconstruct their houses.

Drought of 1972

There was a failure of winter rains during 1971. This was followed by failure of pre-monsoon rains in the early months or the year 1972. The long dry spell in the first few months damaged the crops. The late monsoon, which really started in the fourth week of June was drratic and failed to appear over large areas. This failure caused the withering away of paddy seedlings and there was need for resowing. The agricultural operations were also delayed. The rains of first week of August was inadequate and not sufficient for transplantation. The inadequate rains which continued till the middle of August created a serious drought situation in the district. There was not enough water for transplantation and agricultural operations and large tracts of lands remained uncultivated. Unemployment of the landless and labouring classes increased. There was a demand for more test relief works, gratuitous relief and loans. Scarcity of drinking water was also felt in some areas. In four subdivisions of the district, 12 blocks were affected severely by the drought. A sum of Rs. 12,07,000 was allotted to provide test relief work in the drought affected areas. A sum of Rs. 3,20,000 was allotted under the Agricultural Loans Act.

Flood and Cyclone of 1972

A severe cyclone passed over the district in the year 1972. It caused extensive damage to the standing crops, particularly in the coastal and the Chilika areas. Numerous houses were destroyed. The distress was accelerated by the flood which affected 3,803 villages, 398 Gram Panchayats and 11 urban local bodies. As a flood relief

measure, test relief and house building grants were provided to the people. Under test relief, a sum of Rs. 10,000·00 was provided and under house building grants Rs. 37,35,250,·00 were received and utilised.

Drought of 1976

During the year 1976 the monsoon started late. Rainfall in the month of June was only 40 per cent of the normal. Preliminary agricultural operations were therefore delayed. In July and August, the rainfall was rather concentrated and in its wake, brought in floods in the river systems. Unfortunately instead of being beneficial to the paddy crop, the floods caused damage by sand-casting and water-logging. Rainfall in the month of September was about 60 per cent of the normal and then there was sudden termination from the middle of that month. A dry spell continued from that time except for 2 to 3 days in the 2nd fortnight of October till 25th November. Government declared 161 Grama Panchyats in 21 Community Development Blocks to have sustained 50 per cent crop losses and 17 Grama Panchayats in 8 Community Development Blocks sustaining crop loss of 25 per cent to 49 per cent due to drought.

The following funds were allotted to this district to undertake drought relief measures.

Year	Wheat	Cash (lakhs) Rs.	Purpose
1976-77	900 Metric tonnes	7·14	World Food for Works Programme.
		0·90	Cross Bund
		0·35	Surface Well
		2·46	World Food for Works Programme.
1977-78	400 Metric tonnes	22,00,000	Test Relief

Flood of 1978

The floods in 1978 started with heavy rains on 10th and 12th July resulting in overflowing of the rivers Badanai and Sananai. In this flood 23 villages of 6 Community Development Blocks were affected severely. 1,633 hectares of crops were completely damaged.

Drought of 1979

During 1979 there was practically no pre-monsoon rain in this district. Monsoon started late and the rainfall was erratic. During the months of April, May and June there was no sufficient rain in the

district. The rainfall in August was below normal, being 152·6 mm. against the normal of 242·4 mm. This delayed inter-cultural operations. The rains abruptly stopped and a long dry spell prevailed till the last week of August. Due to this unprecedented situation extensive areas of the district were subject to drought. Government declared 317 villages drought affected, of which 229 villages suffered crop-loss of 50 per cent to 75 per cent and 22 villages suffered crop loss about 75 per cent and above. As a relief measure the following funds were received and utilized.

		Rs.
(1) Test Relief	..	18,09,000
(2) Gratuitous Relief	..	1,15,000
(3) Cross Bunds	..	2,00,000

Flood of 1980

There was heavy rainfall throughout the district in the middle of September, 1980. A depression developed in the north-western bay and it crossed the coast line of Orissa between Puri and Chhatrapur. The peculiar feature of this depression was that it intensified after entering the land causing extraordinarily heavy rainfall in this district. The rivers went on rising and flood appeared in many rivers. As paddy-fields around the villages were already full with rain water the flood water added to the volume and entered the village not protected by embankment. Government declared 17 Community Development Blocks of the district as flood-affected area, 664 villages spread over in 156 Grama Panchayats and Kasinager Notified Area Council. This flood claimed 54 human lives and 4,391 number of livestock and poultry. A total area of 1,323.73 hectares cultivated lands were sand-cast in this district.

Following funds were allotted and utilised for flood relief purpose.

		Rs.
1. Repair of roads	..	25,25,000
2. P. S. M. I. Ps. and Tanks	..	24,80,000
3. Repair of wells	..	4,64,000
4. Repair and Restoration of building	..	7,31,000
5. Repair of Primary school buildings	..	8,67,000
6. Repair of M. E. schools	..	22,70,000
7. Test Relief	..	1,05,000
8. Gratuitous relief	..	4,08,864
9. *Ex-gratia* gratuitous relief	..	39,000
10. House Building Grant	..	10,53,340

Flood of 1981

As a result of a cyclonic storm which centred around 250 km. East-South-East of Gopalpur on the morning of 7th August, 1981, there was widespread rain almost all over the State of Orissa, more so in the basins of the Rushikulya river of the district. In all, 16 Community Development Blocks in the district covering 444 villages and 6 Notified Area Councils and cultivated area of 599.40 hectares were affected by the flood. 101 houses were fully collapsed and 364 houses were partially collapsed. A total area of 200.80 hectares of cultivated lands were reported to have been sand-cast in this district.

The following funds were allotted and utilised for flood relief purpose.

		Rs.
(1) Test relief	..	4,32,000
(2) Repair to School buildings	..	3,60,000
(3) House building grant	..	1,25,000

Drought of 1981

Rainfall during the year 1981 was subject to wide fluctuations. Pre-monsoon showers in the month of June 1981 was much below the normal. The district received actual rainfall of 127.1 mm. during the month of June against the normal of 169.2 mm. As a consequence of this, agricultural operations were delayed. Government declared 223 villages as drought affected of which 158 villages had suffered crop-loss of about 59 per cent to 74 per cent and 65 villages had suffered crop-loss of about 75 per cent. 84 Grama Panchayats of 19 Community Development Blocks had been affected by the drought.

As a relief measure, an amount of Rs. 75,000 had been utilised under cross bunds in drought affected areas.

Flood of 1982

Due to heavy rain in the month of August and September 1982, severe floods came in most of the rivers of this district. The two Community Development Blocks namely Bhanjanagar and Belaguntha were affected severely. There was disruption of communication on account of heavy rainfall and flood. Roads in low lands, particularly the fair-weather roads and the Kutcha roads on the flood areas, were damaged. Government declared 111 villages spread over 27 Grama Panchayats of the above mentioned two C. D. Blocks as flood affected areas.

The following funds were received and utilised for repair and restoration of damaged works due to flood.

		Rs.
Test relief	..	3,70,000
Community Development Department Grant (under roads)	..	2,00,000
Community Development Department Grant (under M. I. Ps.)	..	40,000
Repair to school buildings	..	4,20,000
Reclamation of sand-cast land	..	5,33,000
House building grant	..	1,57,290

Drought of 1982

Due to inadequate rainfall during the year 1982 there were crop-loss of 50 per cent and more in 1271 villages, of which 1089 villages suffered crop-loss between 50 per cent to 74 per cent and 182 villages suffered crop-loss of 75 per cent and above. Out of 29 Community Development Blocks of this district, 26 C. D. Blocks suffered during the drought.

An amount of Rs. 19,93, 750 lakhs was received and utilised in drought-affected areas under the labour intensive works.

Flood and Drought of 1983

Due to incessant rainfall in the month of October 1983 there was heavy flood in this district. The low lands and standing crops were submerged by the flood and the fair-weather roads were disconnected. Rs. 84.50 lakhs were allotted for repair and restroration of roads, minor irrigation points, buildings etc., affected due to flood.

During the last part of the Kharif year 1982, there was drought in the district due to inadequate rainfall. Ganjam and Chikiti Community Development Blocks of this district were affected by the drought severely. Twelve villages were declared drought affected, of which eight villages suffered crop loss between 50 per cent to 74 per cent and four villages suffered crop-loss of 79 per cent and above.

Drought and Flood of 1984

Due to inadequate rainfall during the year 1984, this district was affected by drought. Government declared 2,867 villages as drought-affected villages, out of which 1,402 villages sustained crop-loss of 50 to 74 per cent and 1,465 villages sustained crop-loss of

75 per cent and above, spread over in 29 Community Development Blocks and 13 urban local bodies. An amount of Rs 25,00,000-for the labour intensive works and Rs. 4·50 lakhs for construction of cross-bunds were received from the Government and utilised during 1984-85.

Due to heavy rainfall in the month of June 1984 Paralakhemundi subdivision was effected by flood. An amount of Rs. 41,00,000/- was received from the Government for repair and restoration works damaged due to flood.

Flood and Cyclone of 1990

The year of 1990 started with unusual rains from the month of February. The meteorologist explained this unusual rains due to delay in the arrival of hot westernly winds in full strength to approach the summer. Heavy rains occurred in the district from 10th May to 12th May following the cyclone which hit Andhra Pradesh on the 9th May. In this rain 2,577 villages of 28 Community Development Blocks and 14 urban local bodies with a total population of 3·61 lakhs were affected, 4,986 hectares of cropped area were damaged and 480 hectares were sand-cast in the district.

Another severe devastation occurred in this district in the month of November 1990. A deep depression was formed over the west-central Bay of Bengal and centred at 08.30 hrs. on 2nd November 1990 within half a degree of latitude 16·5^0. North and longitude 85^0 East about 300 km. south of Gopalpur. It intensified further and moved in a north-westerly direction and crossed the South Orissa Coast near Gopalpur in the morning of 4th November, 1990. Under its influence heavy rains occurred in this district on 3rd and 4th November 1990. From the evening of the 2nd November, the deep depression remained stationary over this district for almost 36 to 48 hours. Heavy rainfall was recorded in Digapahandi and Ghodahad catchment area of the district which came to 445m m and 327 m m on the 4th November. The entire Rushikulya basin covering 8979·545 sq.km of drainage area received 250 to 500 m m of rainfall. The area under the Rushikulya river up to Hinjili covering 2599 sq.km received more intense rain averaging 400 m m by 8-00 a.m. on 4th November and the balance drainage area of 6380·545 sq.km received 250 to 300 m m.

The consequence of such catastrophical precipitation was the occurrence of a flood of unprecedented magnitude of approximately 3,00,000 cusecs in the Rushikulya river at Asika (at the confluence of the two major rivers, Rushikulya and Badanadi). as a result of which the old bridge on the Brahmapur—Phulabani State

Highway was swept away disrupting the direct communication between Brahmapur, Asika, Bhanjanagar and further westwards.

After the deep depression crossed Gopalpur coast on 4th November, the rescue and relief operation started in the district. As five major bridges were seriously damaged, the road communications were disrupted, the rescue operations were badly hampered. Disruption of tele-communication, submergence of the National Highway and disruption of rail communication compounded the difficulties. Emergency relief in the beginning was sanctioned for 7 to 15 days according to requirement.

In this flood 1,103 villages of 178 Gram Panchayats were affected. Out of 29 Community Development Blocks of the district, 20 blocks viz., Chhatrapur, Purusottampur, Hinjilicut, Ganjam, Polasara, Kabisuryanagar, Khallikot, Kodala, Sanakhemundi, Digapahandi, Chikiti, Rangeilunda, Patrapur, Bhanjanagar, Sorada, Asika, Sheragada, Dharakot, Belaguntha and Mohana suffered due to the flood. Besides, nine urban local bodies, viz., Purusottampur, Hinjilicut, Ganjam, Polasara, Digapahandi, Chikiti, Bhanjanagar, Sorada and Asika were also affected by the flood and the port of Gopalpur sustained damage.

It claimed a toll of 69 human lives, besides 17 persons were reported missing. The State Government announced an ex-gratia payment of Rs. 25,000/- to the next of the kin of each deceased person. The flood also claimed lives of 8,329 animals and 1,452 birds. About 48,524 houses were fully or partly damaged. The total estimated damage was Rs.380·95 crores. The impact of flood was also felt severely in the field of agriculture. The total cultivated area in the district is 4,82,000 hectares, out of which 1,97,071 hectares were affected which is 42 per cent of the total cultivated area.

Six lakh population comprising 2.4 lakhs adults and 3·6 lakhs children were covered under the emergency relief for 15 days. The expenditure under this account came to Rs. 130 lakhs. The devastating flood rendered 6·5 lakh persons homeless and jobless.

Test relief work was undertaken in the flood affected areas. Under this measure 33 lakhs of rupees was allotted for 269 works and the total mandays generated was 66,545.

A list of some major losses and damages occuring due to this devastating flood in the district is given below :—

1. No. of houses washed away	..	6,732
2. No. of houses fully collapsed	..	14,470
3. No. of houses partly collapsed	..	77,000

4. No. of Major and Medium Irrigation Projects damaged.	..	11
5. No. of Minor Irrigation Projects damaged	..	792
6. No. of Lift Irrigation Projects severely damaged	..	740
7. Extent of canal system damaged	..	2,685 km.
8. Extent of flood protective embankments damaged	..	525.60 km.
9. Length of breaches on roads	..	57.76 km.
10 No. of residential Government Buildings damaged.	..	1,754
11. No. of major bridges severely damaged	..	5
12. No. of educational institutions damaged	..	945
13. Length of roads damaged :—		
(a) Works Department	..	380 km.
(b) Rural Roads	..	1,780 km.
14. No. of tube wells affected	..	1,751

River Embankment :

Embankments for protection against flood inundation in small stretches have existed in the district from the very early times and those were mounds in nature, whereas the general country-side was open to inundation. Now there are 474·362 km. of the Orissa Agricultural embankments and 30,000 km. of the saline embankments along different stretches of the rivers in this district.

A detailed list of the Orissa Agricultural embankments and the saline embankments maintained under the Irrigation Department is given in the appendix I of this chapter.

ANIMAL HUSBANDRY

Animal husbandry in the district is looked after by a Chief District Veterinary Officer posted at Brahmapur. He is assisted by three Assistant District Veterinary Officers, one Assistant District Dairy Officer, four Subdivisional Veterinary Officers, Veterinary Assistant Surgeons, Livestock Inspectors and many other technical staffs. Two Veterinary hospitals, 44 Veterinary dispensaries, 262 Livestock-aid centres, 7 pure Artificial Insemination Centres, 33 key village units, one Feed Mixing Centre and 60 Intensive Cattle Development Centres are functioning in the district.

Cattle, buffaloes and goats play an important role in the economy of the district. These animals are major source of draught power in agricultural operations and transporation, and also yield milk and other products. For farmers, cattle are a valuable form of wealth. Large quantities of animal by-products such as bones, hides, blood, guts, etc., and valuable organic manure are provided by these animals.

The live-stock and poultry population of the district as per 1982 Census are as follows :—

		No. in lakhs
Cattle	..	11.94
Buffalo	..	1.44
Goats	..	3.59
Sheep	..	2.64
Pigs	..	0.34
Poultry	..	5.28

The district is the home tract of Ghumusar cattle, Paralakhemundi breed of buffaloes, Ganjam goats and the Kalinga sheep. All these types/breeds of livestock have a status of their own and a scope for improvement through modern scientific methods of animal husbandry.

The demand for milk, milk products, meat, eggs and poultry meat is increasing day by day due to expansion of Brahmapur town, establishment of Naval Training school at Chilika, the Defence establishment at Golabandha, and estabilshment of the Indian Rare Earth limited at Chhatrapur and the Gopalpur port. So there is vast scope for improvement of animal husbandry activities in the district.

Cattle Development

For overall development of the cattle wealth of the district through improved methods of breeding, disease control, management and feeding, the following schemes are in operation in the district.

Key Village Scheme

There are 3 Key Village Blocks viz., Bhanjanagar, Asika and Paralakhemundi in the district and 11 Key Village Units (K. V. Units) are functioning in each of these C.D. Blocks. Breeding facilities by adopting artificial insemination technique are available in these 33 K. V. Units, out of which 11 units have artificial insemination technique with frozen semen. In addition, the K. V. Units take up

disease control measures, both curative and preventive, advise and assist the farmers about scientific management practices and fodder cultivation.

There are 7 pure artificial insemination centres in the district which provides breeding facilities by artificial insemination techniques. Breeding facilities by adopting artificial insemination technique have been made available at 315 normal veterinary institutions, veterinary dispensaries and live-stock aid centres out of which frozen semen is available at 22 centres.

Intensive Cattle Development Project (I. C. D. P.)

For comprehensive development of cattle of the area the Intensive Cattle Development project, Brahmapur with 60 centres in 4 Live-stock Officers Zones is in operation since 1972-73.

Under the Natural Breeding Programme, 35 bulls and 4 buffalo bulls have been stationed with interested hosts at different places of the district to provide breeding facilities in the areas where there are no artificial insemination facilities.

Live-stock Breeding and Dairy Farm

One Live-stock Breeding and Dairy Farm has been established at Bhanjanagar with the objectives of production of breeding bulls, demonstration of scientific methods of breeding and dairy farming. It has been decided to rear only Haryana breed of cattle in this farm.

Heifer Rearing Scheme

To meet the demand of quality milch cattle a heifer rearing scheme with financial assistance from District Rural Development Agency, Ganjam has been taken up at the Live-stock Breeding and Dairy Farm, Bhanjanagar since 1986-87. Under the scheme cross-bred Jersey heifer with about 6 months of pregnancy are purchased and reared in this farm till calving and are sold to Integrated Rural Development (I. R. D.) beneficiaries.

Calf-rearing Scheme

A scheme of calf-rearing has been started during the year 1987-88. The aim of the scheme is to supply feed to 1300 cross-bred female calves belonging to small/marginal farmers and agricultural labourers of the district at a cost of five lakhs of rupees.

Disease control measures

The animal diseases prevalent in the district are general systemic diseases, parasitic diseases and contagious diseases (viral or bacterial). The general systemic diseases and parasitic diseases are treated in verterinary institutions. The contagious diseases, however, are the cause of real concern for the farmers as these diseases create havoc at the time of attack. In these diseases large number of animals die within no time affecting the economic condition of the farmers very badly.

The common contagious diseases encountered among the animals in the district are :—

Diseases	Species affected
(A) Viral	
(i) Rinderpest	Cattle, Buffaloes, sheep and goat
(ii) Foot and mouth disease	Do
(iii) Ranikhet disease	Fowls
(iv) Foul Pox	Do
(v) Rabies	All animals
(B) Bacterial	
(i) Haemorrhagic septicaemia	Cattle, Buffaloes
(ii) Black Quarter	Cattle
(iii) Anthrax	Cattle, Buffaloes, sheep

To control different contagious diseases preventive vaccination is being given as a routine by the Veterinary hospitals, dispensaries, Live-stock Aid Centres, Key Village Units, Intensive Cattle Development Centres and Artificial Insemination Centres free of cost. Only for vaccination against foot and mouth diseases, a nominal subsidised amount is charged to the cattle-owners.

Investigation of disease

At the clinical investigation laboratory located at Brahmapur facilities for diagnosis of diseases have been provided to assist the field staff of the Southern Range comprising the districts of Ganjam, Koraput, Kalahandi and Kandhamal to diagnosis and confirm the disease that requires special investigation by examination of different pathological specimens.

Rinderpest Eradication Programme

Under this programme there are one Veterinary Assistant Surgeon (in-charge) and 12 Livestock Inspectors. These staff take up preventive vaccination of cattle against Rinderpest in inter-state border villages and attend rinderpest outbreaks, if it occurs.

Diary Development

With the aim of developing diary development activities and to provide suitable infrastructure for marketing of milk produced by the farmers in the villages, steps have been taken to assist the farmers to organise Milk Producers' Co-operative Societies (M. P. C. S.) in villages. So far 86 Milk Producers' Co-operative Societies have been organised in the district. The Milk Producers' Co-operative Societies have been federated to the district level to form the Ganjam District Co-operative Milk Producers' Union with headquarters at Brahmapur. The District Milk Union collects milk from member-societies and markets in Brahmapur town after processing in the chilling plant located at Brahmapur. Another chilling plant, with a capacity of 2000 litres per-day is proposed to be established at Asika.

By the end of 6th Five Year Plan period the estimated milk production in the district was 49 M. T. per annum. It is proposed to raise this to 55 M. T. during the 7th Five year plan period.

Establishment of Dairy Complex

In order to encourage the Scheduled Caste and the Scheduled Tribe farmers of the specially vulnerable group to take up dairy farming for improvement of their economic condition, a dairy complex is being taken up at Mahuda of the district. Under the programme 20 Scheduled Caste/Scheduled Tribe farmers will form a co-operative society to take up dairy farming. The funds to a tune of Rs. one lakh has been released and preliminary work is in progress.

Fodder Cultivation

Paddy being the major crop in the district paddy straw is available as the staple roughage throughout the year for the cattle and buffaloes. Paddy straw is considered as a poor quality roughage for the cattle and buffaloes. There is acute shortage of green fodder in the district. With the view to demonstrate the utility of green fodder for the cattle and to encourage farmers to take up fodder cultivation, fodder demonstration plots have been started at some of the veterinary institutions where land is available. Besides, under the subsidised Fodder Cultivation Scheme and Development of Fodder Resources Scheme farmers are provided subsidy in forms of seeds, roots and

fertilisers to take up fodder cultivation in their own land. Farmers are also encouraged to plant fodder trees like Subabool, Agasti in their backyards. Seedlings are supplied to them free of cost for this purpose.

Cattle shows

In order to encourage the farmers to take up rearing of improved animals and to develop a spirit of competition to breed quality animals, cattle shows are organised at different places of the district. These are mostly held during the Gosambardhan Week and quality animals are also given prizes. For this, financial help is made available by the Animal Husbandry and Veterinary Department and also by the Utkal Gomangal Samiti and the District Rural Development Agency, Ganjam. In the past years shows were held at the following places.

Year	Places of the show	No. of exhibits
1983	Chhatrapur	88
1984	Kukudakhandi	95
1985	Hinjilicut	97
1986	Jillundi (Bhanjanagar)	100

Poultry Development

In the past, poultry birds were mostly reared by Scheduled Caste and Scheduled Tribe farmers. Gradually poultry rearing with commercial birds is gaining popularity consequent upon growing demand for eggs, poultry and broiler meat.

There is one Poultry Breeding Farm under the Animal Husbandry and Veterinary department at Bhanjanagar. It used to supply eggs and birds to the area for hatching and table, besides serving the purpose of demonstration and training.

Besides, there is one All India Poultry Development Centre at the Veterinary Dispensary, Karapalli and one Animal Nutrition Programme Poultry Unit at the Veterinary Dispensary, Khallikot. These units cater to the demand of hatching eggs in addition to acting as demonstration units of the area.

A number of private farmers have taken up poultry keeping and broiler farming on commercial basis with and/or without financial assistance from different banks.

Feed Mixing Centre

To manufacture balanced cattle and poultry feeds (concentrates) a Feed Mixing Centre has been established at Bhanjanagar. One Additional District Veterinary Officer (Poultry) is in charge of the

centre. From this institution mixed poultry and cattle feeds are supplied to different government poultry units and dairy farms. Mixed poultry feed is also sold to interested private poultry farmers.

Intensive Poultry Development Project

The Intensive Poultry Development Project with headquarters at Brahmapur is in operation since 25th June, 1975. One Project Officer is in charge of the project. The jurisdiction of the project is within an area of 60 km. radius around Brahmapur town.

The aim of the project is to encourage private entrepreneurs to take up poultry farming with layers or broilers either with their own finance and/or with credit from financial institutions. The project arranges supply of chicks, health cover facilities and marketing of poultry and poultry products. It also encourages poultry farmers to form poultry producers co-operative societies. So far 10 Poultry Producers Co-operative Societies have been organised and registered.

Sheep Development

This district is the home tract of Kalinga type of sheep. These are sturdy mutton type of sheep and popular for mutton. These are reared by the farmers. They generally follow the cattle herd of the villages for grazing. Traditional sheep herds also rear these sheep in large numbers. Veterinary aid and health cover facilities are provided to them by the field veterans as and when required.

Goat Development

The Ganjam type of goats are mostly seen in this district and are reared by the traditional goat keepers in large numbers. Veterinary aid and health cover are provided to them by the field veterinary institutions as and when required.

Piggery

Traditionally the Scheduled Castes and the Scheduled Tribes people rear pigs. Local breeds of pigs are popular due to their capacity to resist diseases and they thrive under minimum care and management. Interested farmers are encouraged to rear pigs with financial assistance and subsidy under the Integrated Rural Development and the Economic Rehabilitation of Rural poor Programmes.

20-Point Programme

Steps have been taken by the Government in the Animal Husbandry Department to provide cows, buffaloes, sheep, goats,

poultry and ducks under the anti-poverty programme for the economic development of the poor people. The achievements made in this respect from 1980-81 to 1986-87 are as follows.

Units	E. R. R. P.	I. R. D. A.
	No. of units established and farmers benefited	No. of units established and farmers benefited
(1)	(2)	(3)
Dairy	3,767	12,530
Goat	4,680	13,150
Sheep	415	
Piggery	815	1,405
Poultry	94	249
Duckery	40	

FISHERIES

Ganjam, one of the four maritime districts of Orissa, has a coast line of 60 km. with continental shelf of 2,500 sq. km. In the inland sector there are 7,864 sweet water tanks belonging to private, Grama Panchayats and Government, the water area of which stretch to 7,736 hectares. Out of these, 4,240 numbers of tanks having water area of 3,698 hectares are suitable for scientific pisciculture as ascertained from the survey conducted by the State Fisheries Department. Besides there are 195 Minor Irrigation Projects having water area of 18,510 hectares and vast area of rivers, canals, swamps and brackish water tanks which contribute substantially towards supply of fish.

The important activities of the Fisheries Department in the marine as well as inland sectors of the district are given below.

Marine Sector

The pelagic fishes are landed in the coastal belt of the district. The annual landing is roughly 5,965 metric tons (1986-87). The important varieties are scieanids, leaser, sardires, mackerel, perches, seer fish and elasmobranches. The demorsal fishes mainly consists of crustaceans, catfishes and sciaenids. There are no

mechanised crafts in the district due to non-availability of landing and berthing facilities. The principal craft in the district is log-built catamarans. As per the survey there are 2,900 catamarans operating in the coastal belt out of which about 900 are big catamarans used with sails. Besides, 232 bar boats are also operating in the coast of the district. Recently one improved type of mechanised boat named as beach landing craft designed by the Bay of Bengal programme/F. A. O. has been introduced for improving the socio-economic conditions of the traditional marine fishermen. During 1985-86, one such craft was experimentally operated by the Fisheries Department which landed 10,028 m. tons of marine fish valued at Rs. 38,022. Based on the performance of the craft, 10 such crafts are to be supplied to the members of Gopalpur and Nua-Baxipalli Primary Marine Fishermen Co-operative Societies. During 1986-87, 6 such crafts have been given to the members of Gopalpur Primary Marine Fishermen Co-operative Society. This will benefit 30 members of the society and will generate an employment potential of 600 man-days per year.

The main gears used in this district are gill nets made of nylon twine and of different mesh sizes. About 6,000 such types of nets including shore seine and beach seine are found in this district. Improved type of gears, large mesh drift gill nets are used for offshore fishing in the beach landing crafts which have shown good result.

There is a proposal for construction of fishing harbour at Aryipalli near Gopalpur at an estimated cost of Rs.599 lakhs which is under active consideration of the Government of India. After completion, a minimum number of 120 mechanised vessels can be accommodated in the harbour.

Marine fishermen of this district are being covered under different welfare schemes sponsored by the Government of India, apart from the State Government's anti-poverty schemes like Economic Rehabilitation of Rural poor, Integrated Rural Development Programme and Assistance to Traditional Marine Fishermen, etc. Amongst different welfare schemes, accident insurance to fishermen of this district has been taken up. Under this scheme a sum of Rs. 15,000. is paid to the next kith and kin in the event of death of the fishermen due to accident or Rs.7,500/- in the event of partial loss of organs. Till 1986-87, fishermen numbering 1500 have been covered under the schemes as new cases and 1803 as renewal of cases. In order to educate children of the coastal fishermen, 8 non-formal education centres have been operated by the Bay of Bengal Programmes in which 240 children are attending.

Under the Bay of Bengal Programme credit pilot scheme 850 cases were forwarded to banks and the marine fishermen availed loan amounting to Rs.18,34,076 for purchase of boat and net, out of which a sum of Rs.5.27,766 has already been repaid by them.

Another scheme Saving-*cum*-Relief Fund has been introduced in which marine fishermen are benefited by availing financial relief from Government during lean period of fishing in which 500 marine fishermen of the district have been benefited.

To supervise the marine works of the district one Assistant Director of Fisheries (Marine) has been posted at Ganjam. Three Fishery Extension Officers have been posted at Ganjam, Gopalpur and Sonepur to keep liaison with the Assistant Director of Fisheries (Marine) and the coastal fishermen in implementing different on-going marine fisheries schemes.

Inland Sector

There is a remarkable progress in the field of pisciculture in private and Grama Penchayat tanks of the district with the development of new scientific technique in pisciculture. In order to meet the growing demand of quality fish seed in the district, maximum stress has been given on production of induced-bred spawn departmentally and also in private sector.

For development of inland fisheries a Fish Farmers Development Agency with the World Bank assistance with Collector as Chairman and a Fishery Officer of the rank of Assistant Director of Fisheries as the Chief Executive Officer has been established in the district. The main objectives of the Agency are:—

(1) To cover available water area under modern pisciculture practice.

(2) To make available institutional finance to the fish farmers with necessary subsidy from the agency.

(3) To prepare plan and estimate for renovation and excavation of tanks and to supervise the work through the technical staff.

(4) To impart technical know-how to the fish farmers through the extension agency set up in each block.

(5) To train the fish farmers for scientific management of the culturable water area and also to train interested entrepreneurs on induced breeding of fish.

The agency also monitors family-oriented poverty eradication schemes under the Integrated Rural Development/Economic Rehabilitation of Rural poor Programme relating to inland pisciculture. By the end of 1986-87, persons numbering 3,101 have been benefited and 3053.26 hectares of water area have been developed through the Fish Farmers Development Agency. An amount of Rs. 87.98 lakhs have been sanctioned as loan for the above purpose out of which Rs. 9.62 lakhs have been released as subsidy by the agency. 2,262 persons have been given scientific pisciculture training in the district so far.

There are 9 fish seed farms in the district managed by Fisheries Department having 13.12 hectares of nursery area and 8.89 hectares of stocking area. The department has produced 287 lakhs of quality spawn by induced-breeding method during 1986-87. Out of these spawn 65.88 lakhs of fry has been produced in departmental farms for distribution to the private pisciculturists and fishermen for stocking in their tanks during the above year. One fish seed hatchery has been established in the district at Bhanjanagar with the World Bank assistance by the Fish Seed Development Corporation. 57.00 lakhs of fry have been produced in the hatchery. Besides, 101.18 lakhs of fry have been produced in the private sector during 1986-87. The demand of fish fry in the district during 1986-87 was 190.81 lakhs and the total supply was 224.66 lakhs. The present inland fish production in the district is 4,824 m. tons and its approximate farm-site value is around Rs. 65 million.

To monitor and execute different supervisory and developmental schemes in the inland sector there is one Assistant Director of Fisheries with headquarters at Brahmapur.

For development of prawn culture in brackish water tanks, one Brackish Water Fish Farmer's Development Agency has been established at Puri covering Ganjam and Puri districts with Collector of Puri as Chairman and a Fishery Officer of the rank of Assistant Director of Fisheries as the Chief Executive Officer.

The aims and objects of the Agency are as follows:

(1) To survey the resources available in the district to take up brackish water prawn culture.

(2) To select suitable site for taking up brackish water prawn culture.

(3) To select beneficiaries to take up prawn culture with the Brackish Water Fish Farmers' Development Agency subsidy and other assistance.

(4) To give overall technical guidance for prawn and brackish water pisciculture.

(5) To train entrepreneurs and fish farmers in modern way of prawn and brackish water fish culture.

(6) To collect prawn seed from the natural resources and supply to the fish farmers.

The agency have so far helped the beneficiaries by developing 141.82 hectares of water areas for development of brackish water prawn and fish culture in the district. An amount of Rs. 4, 92,062.00 have been disbursed as loan to the beneficiaries and Rs. 79,112.00 have been released as subsidy by the agency upto the end of 1986-87.

A prawn hatchery complex has been established at Gopalpur-on -sea by the Marine Products Export Development Authority in 1988. This is the first commercial shrimp hatchery in India and is established with the French collaboration. The estimated cost of the project is Rs. 2·5 crores. The entire investment is made by the Marine Products Export Development Authority under the Ministry of Commerce, Government of India. The State Government have provided 19,035 hectares of land free of cost. The hatchery has been developed in about 4.50 hectares of land and the remaining 14.985 hectares will be utilised for the demonstration of prawn farm which will be set-up in the near future. At full development the hatchery will produce 50 million post-larve prawn seed in a year. Trial run of this hatchery has shown a remarkable success by producing more than 2.5 million of shrimp seeds in a short period of about a month (during July-August 1988). About 1.5 millions of seeds have been sold to different farmers of the state. Commercial production of this hatchery has been planned to start from January 1989. There is also a proposal to supply seeds to other parts of the country.

An amount of Rs. 24.25 lakhs has been received by the Orissa Maritime and Chilika Area Development Corporation during the year 1985-86 from the Government of India as grants-in-aid for execution of brackish water prawn culture scheme at Binchanapalli in the Chilika lake area of the district and for the work of construction of prawn

hatchery in Aryapalli. The above amount has been received against 50 per cent Central Government share amounting to Rs. 112.91 lakhs on the total administrative approval of the Government of India for Rs. 225.82 lakhs for the scheme.

IMPORTANCE OF FOREST IN THE ECONOMY OF THE DISTRICT

The forests of the district, as elsewhere, are intimately connected with the economy of the people. The forest-based industries and forest exploitation works provide employment to a large number of people. The forests serve as grazing ground for the ever-increasing cattle population and also to meet the requirement of timber, fire-wood, bamboo, cane, etc. Major portion of fuel wood requirement is met from the forests. Besides, the forests supply many edible fruits and roots for human consumption. A large number of poor people of the district live on these fruits and roots when they go short of their agricultural product.

Forest Produce

Timber, fire-wood and bamboo are the principal forest products. Among the minor forest products, mention may be made of sal seeds, cashewnut seeds, siali leaves, Kochila seeds, Patalagaruda roots, nux-vomica, cane, Sabaigrass, broom-stick, Sal leaves, soapnut, tamarind, Mahua flower and seeds, myrobolam, Mersinga leaves, Karanja and Kataka seeds. Chief categories of timber available are *sal, piasal, asan, gambhari, sissoo* and teak. After meeting the local demand, timber is exported outside the district. A large variety of medicinal plants are also available in the forest.

A few cottage industries like cart-making, basket-making, and making of bamboo-mat, date-palm mat, etc., depend on the forest for the raw materials.

Shifting cultivation by burning forest areas was a common practice mainly with the Scheduled Tribes living near the forests. Besides, unrestricted and irregular felling done in the past was also responsible for the rapid deterioration of the forests in the district. Scientific exploitation was gradually introduced since the beginning of the present century to preserve the forest to meet the growing demand of local people and also to obtain substantial revenue for the state exchequer.

The following statement shows income from major and minor forest produces from the three forest divisions located in the district, viz., Ghumusar south, Ghumusar north and Paralakhemundi from 1985-86 to 1989-90.*

Year		Revenue collected from the major/ minor forest produce (in Rs.)
(1)		(2)
Ghumusar South		
1985-86	..	73.17,084.00
1986-87	..	68,54,504.00
1987-88	..	90,00,418.00
1988-89	..	82,31,174.00
1989-90	..	54,52,696.00
Ghumusar North		
1985-86	..	1,45,65,038.00
1986-87	..	1,22,00,089.00
1987-88		1,33,07,530.00
1988-89	..	97,44,415.00
1989-90	..	99,80,985.00
Paralakhemundi Division		
1985-86	..	71,23,823.00
1986-87	..	68,12,576.00
1987-88	..	68,89,924.00
1988-89	..	69,16,226.00
1989-90	..	23,32,516.00

More about the forests of the district finds mention in the Chapter-I, "General".

* Source—Conservator of Forests, Brahmapur.

APPENDIX I

List of River Embankments in the District

Name of River	Left/ Right	Name of embankments	Length in km.
(1)	(2)	(3)	(4)
(i) Orissa Agricultural Embankments			
Chikiti Irrigation Division			
Bahuda ..	..	..	1·50
Bogi ..	..	..	7·84
Padmatolanala ..	..	..	3·41
Vamsadhara ..	..	..	4·65
Kantaijorenalla ..	..	..	4·60
Total			22·00
Brahmapur Irrigation Division			
Rushikulya ..	Left	Near Hiradharbati at Hanumanpalli.	1·20
Do. ..	Right	Near Hiradharbati at Hanumanpalli,	0·50
Do. ..	Left	Machhai to Hanumanpalli	4·50
Do, ..	Left	Hanumanpalli to Antarigam	5·00
Do. ..	Left	Gobindpur to Pandia ..	2·60
Do, ..	Left	Kapileswar Sasan to Kumari Banapalli.	0·40
Do. ..	Left	Near Kainchapur ..	1·00
Do. ..	Right	Sikiri to Burutulu ..	10·00
Do. ..	Right	Solaghar to Hindolo ..	1·60
Do. ..	Right	Karapada to Alibad ..	1·60
Ghodahadh ..	Right	Near Basudebpur ..	0·27
Ghodahadh ..	Right	Near Khalingi ..	1·23

Name of the river	Left/Right	Name of the embankment	Length in km.
(1)	(2)	(3)	(4)
Ghodahadh ..	Right	Near Laxmipur ..	2·00
Ghodahadh ..	Right	Near Khairabatti ..	1·75
Ghodahadh ..	Right	Near Balarampur ..	3·00
Ghodahadh ..	Right	Near Singipur ..	1·70
Ghodahadh ..	Right	Near Chanduli ..	2·00
Baghua ..	Left	Near Karatali ..	1·00
Baghua ..	Left	Near Ghodapalana ..	1·65
Baghua ..	Left	Near Osinga ..	0·80
Baghua ..	Left	Near Mathetentulia ..	1·40
Baghua ..	Left	Near Gobindpur ..	0·60
Baghua ..	Left	Near Borida ..	2·00
Baghua ..	Left	Near Bhatepada ..	1·60
Baghua ..	Left	Near Baliapalli ..	0·80
Baghua ..	Left	Near Ambapua ..	1·60
Baghua ..	Left	Bholamundala ..	2·00
Baghua ..	Left	Near Sandhamara ..	1.20
Baghua ..	Left	Near Baliasara ..	4·00
Baghua ..	Left	Near Haradapadar ..	1·60
Baghua ..	Left	Near Balasore ..	3·00
Baghua ..	Left	Near Bhetasingi to Tankachai	3·20
Dhanei ..	Right	Near Randi ..	1·40
Dhanei ..	Right	Near Bhabarada ..	1·10
Dhanei ..	Right	Near Tentulia ..	1·00
Dhanei ..	Right	Near Patigada ..	2.00
Dhanei ..	Left	Near Madhupalli ..	1.60
Dhanei ..	Left	Near Kankarada ..	0·80

Name of the river (1)	Left/Right (2)	Name of the embankment (3)	Length in km. (4)
Dhanei ..	Right	Near Rukukana	1·20
Dhanei ..	Right	Near Kalambo	1·20
Dhanei ..	Right	Near Jenapur	0·80
Dhanei ..	Right	Near Jakara	1·00
Dhanei ..	Left	Near Ihem Nimundia	1·00
Dhanei ..	Right	Near Ihem Nimundia	1·00
Dhanei ..	Left	Near Bada Chandhipada	2·00
Dhanei ..	Left	Near Barida	1·30
Dhanei ..	Right	Near Barida	3·01
Dhanei ..	Left	Near Borosingi	1·00
Dhanei ..	Right	Near Borosingi	1·30
Dhanei ..	Right	Near Ekadasi	1·60
Dhanei ..	Right	Near Ambapua	1·60
Dhanei ..	Left	Near Anam Dengapadar	0·60
Dhanei ..	Left	Near Nandiguda	0·80
Dhanei ..	Left	Near Hindolo	0·80
Dhanei ..	Right	Near Sadabartinuagam	0·60
Dhanei ..	Right	Near Baliasara	2·20
Dhanei ..	Right	Near Bolosra	1.40
Dhanei ..	Right	Near Sunarijhola	1·40
Kharkharia ..	Left	Near Angargam	1·50
Kharkharia ..	Right	Near Angargam	1·50
Kharkharia ..	Left	Near Karanjoro	2·00
Kharkharia ..	Left	Near Karanjoro	2·02
Kharkharia ..	Right	On Kendua nalla from Dhamara - khota to Head Works	1·00

Name of the river (1)	Left/Right (2)	Name of the embankment (3)	Length in km. (4)
Ghodaka ..	Left	Near Natridi	3·20
Ghodaka ..	Right	Near Natridi	3·20
Ghodaka ..	Left	From Chkrada to Panapalli	6·00
Nuanai ..	Right	From Chkrada to Panapalli	6·10
			125·40
Bhanjanagar Irrigaton Division —			
Badanadi ..	Right	RFB of Badanadi from Nuapalli to Pudgeswarpaill	16·20
Badanadi ..	Right	Badanadi RFB from Turemu to Karada.	8·39
Badanadi ..	Right	Badanadi RFB from Dahanapalli to Mandar	14·25
Badanadi ..	Right	Badanadi RFB from Nuapalli to G. Anicut	19·31
Badanadi ..	Right	Badanadi RFB from Pathara to Pakhal	81·25
Badanadi ..	Right	Badanadi RFB from Raipalli to Nuagaon.	11.20
Badanadi ..	Right	Badanadi RFB from Kanabhangai to Dhanijapalli	3·62
Badanadi ..	Right	Badanadi RFB from Jalakha to Dhanaja	13·40
Badanadi ..	Right	Badanadi RFB from Dhanja to Gabanalla	5.67
Rushikulya ..	Right	Rushikulya LFB near village Jahada.	1·82
Rushikulya ..	Right	Rushikulya LFB from Mangalpur to Asika.	2·80

Name of the river	Left/Right	Name of the embankment	Length in km.
(1)	(2)	(3)	(4)
Rushikulya ..	Right	Rushikulya LFB from Rushikulya bridge to confluence of R. River and Badanadi.	6·41
Rushikulya ..	Right	Rushikulya from Gudisara to Brahmmachai.	2·00
Rushikulya ..	Right	Rushikulya LFB from Brahmmachai to Machchai.	1·65
Loharakhandi	Right	Loharakhandi RFB from Kaithapalli to Gamundi.	4·115
Loharakhandi	Right	Loharakhandi from Sirikoi to Madhavanda.	5·00
Loharakhandi	Right	Loharakhandi LFB from Barmganalla to Mundar.	8·525
Badanadi ..	Right	Badanadi RFB near village Rauti.	1.41
Badanadi ..	Left	Badanadi LFB near village Jirabadi.	1·50
Kokulaba ..	Right	Kokulaba RFB from Balichai to Rahapalli.	7·40
Kokulaba ..	Right	Kokulaba RFB from Balichai to Rajapalli.	1·185
Kokulaba ..	Right	Kokulaba RFB from Barapalli to Jadahara.	1·883
Kokulaba ..	Right	Kokulaba RFB from Jadadhara to Kokalaba.	2·372
Kokulaba ..	Right	Kokulaba RFB from Kokulaba to Tarasingh.	5·294
Kokulaba ..	Right	Sananadi and Kadalianalla RFB Gothalunda to Tanarada.	4·735
Sananadi ..	Left	Sananadi and Kadalianaila LFB from Gothalunda to Tanarada.	4·735

Name of the river	Left/Right	Name of the embankment	Length in km.
(1)	(2)	(3)	(4)
Kaliambanalla	Right	Kalliambanalla RFB from Gobara to Saradadauga.	2·000
Kaliambanalla	Left	Kaliambanalla RFB Gobara to Saradadauga.	2·000
Kaliambanalla	Left	Hatimundanalla LFB from Jolundi to Bhaliakadi.	2.32
Badanadi ..	Right	Badanadi RFB near village Kulad.	0.426
Badanadi ..	Right	Badanadi RFB near village in Betara.	0.210
Badanadi ..	Right	Badanadi RFB from Ghatuni to Jadaghatuni.	0.700
Badanadi ..	Right	Badanadi LFB near village Beruabadi.	2.010
Badanadi ..	Right	Badanadi LFB near Tidisingi to Adnapalli.	2.700
Badanadi ..	Right	Badanadi from Dhumuehai to Kurulai.	3.785
Badanadi ..	Right	Badanadi RFB Kurulai to Suranalla.	1.800
Badanadi ..	Right	Badanadi RFB near village from Sorisamuli.	0.900
Rushikulya ..	Right	Rushikulya RFB near village Kalasandapur.	1.680
Rushikulya ..	Right	Rushikulya RFB near village Nalabanta.	1.000
Rushikulya ..	Right	Rushikulya LFB from Gopalpur to Palkata.	2.850
Rushikulya ..	Right	Rushikulya RFB near village Narayanpur.	0.800
Loharakhandi	Right	Loharakhandi LFB near village Durgaprasad.	0·815

Name of the river (1)	Left/Right (2)	Name of the embankment (3)	Length in km. (4)
Loharkhandi ..	Right	Loharkhandi LFB and RFB near village Badakodamda.	1.210
Loharkhandi ..	Right	Loharkhandi RFB Bhaliakhai to Kusapalli.	1.846
Badanadi ..	Right	Badanadi RFB near village Chandiapalli.	2.550
Badanadi ..	Right	Badanadi LFB near village Ambapua.	1·610
Badanadi ..	Right	Badanadi LFB near village Jiroli	1·400
Kokulaba ..	Right	Kokulaba LFB near village Patangi.	0·400
Kokulaba ..	Right	Kokulaba RFB near Dalaka ..	1·450
Kokulaba ..	Right	Kokulaba RFB near Baradauda	1·127
Kokulda ..	Left	Kokulaba LFB from Gayaganda to Patangi.	1·210
Kokulaba ..	Left	Kokulaba LFB near village Masabadi.	1·255
Kokulaba ..	Left	Kokulaba LFB from Gayaganda to Masabadi.	3·220
Kokulaba ..	Left	Kokulaba LFB from Dhakapalli to Utal.	1·234
Kokulaba ..	Left	Kokulaba LFB near village Kandhasarula.	0·660
Padma ..	Right	Padma RFG near village Takarada.	1·700
Bethura ..	Left	Bethuranali LFB Kanagiridi at Bethura.	1·000
Ghodahada	Left	Ghodahada LFB near village Balia,	1·700

Name of the river (1)	Left/Right (2)	Name of the embankment (3)	Length in km. (4)
Ghodahada	Left	Ghodahada LFB near Patharapujji	0·800
Kadalianalla	Left	Kadalianalla LFB near Gopinathpur.	3·220
Kadalianalla	Left	Kadalianalla LFB near Gopinathpur, from Patrapalli to K. Brahmapur.	4·735
Hatimundanalla	Right	Hatimundanalla RFB from Jilundi to Bhaliakhai,	1·610
Kotipadanalla	Right	Kotipadanalla RFB Kotinda-Gujurili,	2·635
Kotipadanalla	Left	Kotipadanalla LFB from Kotinda to Gujurali,	2·635
Gofinalla ..	L. & R.	Gofinalla RFB from Nuripada to Nuagad.	5·000
Saranalla ..	L. & R.	Saranalla RFB and LFB from Barapalli to Dagapadar.	5·000
Kalimbanalla	Right	Kalimbanalla RFB and LFB Mariapatto Gobara.	3.220
Naturinalla ..	Right	Naturinalla RFB from Kathachira to Sorisamuli.	0·430
Kupatinalla	Left	Kupatinalla LFB and RFB from Dhobanibandha to Narigochha.	3·000
Hadhadianalla	L. & R.	Hadhadianalla RFB and LFB near village Kalighada.	2·600
Sunanadi ..	L. & R.	Sunanadi RFB and LFB near village Jhaliagocha.	0·400
Bethura ..	Left	Bethuranali LFB Kanagiridi at Bethuar,	1·100
Sunanadi ..	Right	Sunanadi RFB near village Jhaliagocha LFB near village Gallery,	0·400

Name of the river (1)	Left/Right (2)	Name of the embankment (3)	Length in km. (4)
Sunanadi ..	Left	Sunanadi LFB near village Ranikiari.	0·330
Godhininalla	Left	Godhininalla LFB ..	0·500
Baghuanalla	Left	Baghuanalla RFB near village Kalingapada.	0·500
Baghuanalla	Left	Baghuanalla LFB near village Kalingapada.	0·500
Baghuanalla	Right	Girinaganalla RFB from Toldito Dengabhuni.	1·020
Giringanala	Left	Giringanalla LFB near village. Dengabhuni.	0·715
Kanphulianalla	Left	Kanphulianala LFB near Langa-lakhola.	0·319
Latakiarinalla	L. & R.	Latakiarinalla RFB and LFB near village Kolaluba.	1·500
Katuranalla	L. & R.	Katuranalla RFB and LFB near village Balichai to Tilisingh	10.500
Bantonalla	Right	Bantanalla RFB from Gereda to Balichai	2.000
Tentulianalla	L. & R.	Balipat Tentulianalla LFB and RFB from Andharakote to Bhanjanagar	4.830
Janghainalla	L. & R.	Janghainalla LFB and RFB Sediapalli anicut to Samakodanada	3.220
Barmanalla	L. & R.	Barmanalla LFB and RFB from Nirisingi to Sanakodanda	6.440
Gudisanalla	L. & R.	Gudisanalla RFB and LFB near village Sidhapadar	3.220
Haridanalla	L. & R.	Haridanalla RFB from Madhapur to Gudipadar	6.440
Andharkote	Right	Andharakote nalla LFB and RFB from Andharakote to Durgaprasad	1.610

L. & R. means Left and Right

Name of the river (1)	Left/Right (2)	Name of the embankment (3)	Length in km. (4)
Kohakilinalla	Left	Noharkholi nalla LFB near Baparei	1·610
Balinalla ..	L. & R.	Balianalla LFB and RFB from Bhanjanagar—Phulabani road to Buduli	3.220
Kanhiswar - nalla	L. & R.	Kanhiswaranalla RFB and LFB near Pallipada	4.830
Kaliam b a - nalla	L. & R.	Kaliamba nalla LFB and RFB near village Kaindi	0.800
Baghua ..	Right	RFB of river Baghua from Hatia to Mathatentulia	3.500
Baghua ..	Right	RFB from Mathatentulia to Barida	2.00
Baghua ..	Right	RFB from Mathatentulia to Barida	2.00
Baghua ..	Right	RFB from Barid ramp to Hummuki	2.00
Baghua ..	Right	RFB Hummuki to Haridapadar	2.00
Baghua ..	Right	RFB from Kantapadsi to Tankachai	0.500
		Total	326.952

(II) Salina Embankments :—

Brahmapur Irrigation Division :—

1	From Sipakud to Prayagi	..	8.00
2	From Rambha to Sabulia	..	5.00
3	From Gopakud to Bikrampur	..	4.00
4	From Langaleswar to Pathara	..	6.00
5	Near Odialpur	..	1.00
6	Near Kankei	..	4.00
7	Kharinalla of Dalibandha	..	2.00
	Total	..	30·00

General Abstract :—

(I)	Orissa Agricultural Embankment	.. 474,362	km.
(II)	Saline Embankment	.. 30,000	km.
	Total	.. 504,362	km.