

CHAPTER IV

AGRICULTURE AND IRRIGATION

43. Land Utilisation

The total geographical area of the district is 2,705,000 acres (1,096,000 hectares). About 39 per cent of this area is utilised for agricultural purposes—the cultivated area being 956,000 acres ¹ (387,000 hectares). Forests extending over 1,569,920 acres (627,968 hectares) cover about 58 per cent of the district area.

44. Irrigation

Rivers Mahanadi and Brahmani, the two main rivers of the district, have a number of tributaries. But none of them have been harnessed for irrigation. The main sources of irrigation are, therefore, either tanks or other minor irrigation projects constructed by diverting or storing water of hill streams. So there is no major irrigation project. The only medium irrigation project having an *ayacut* or irrigated area of 16,000 acres is at Derjang. (A detailed account of this project has been given separately). The irrigation coverage of the total cultivated area in the district is hardly 9 per cent. Only about 91,000 acres and 40,000 acres of land receive irrigation during Khariff and Rabi seasons respectively ².

A list of minor irrigation projects which now irrigate about 26,000 acres during Khariff and about 600 acres during Rabi seasons has been given as Appendix I to this Chapter. Agriculture depends mainly on rainfall. As the district is very much susceptible to drought conditions on account of untimely rainfall or failure of monsoons, the minor irrigation sources (i. e., hill streams, tanks and reservoirs) have proved as a stand-by for irrigating Khariff crops. But these are not adequate in all parts of the district and do not provide water for Rabi crops.

Derjang Irrigation Project

This is a medium irrigation project and is the largest irrigation project in the district. Its construction was started in 1960 with an estimated cost of Rs. 3,72,35,900. The work was conducted under supervision of Irrigation Project Division of Hirakud Dam Project. The spill-way has been completed. Only fixing of gates and construction of a bridge are to be done. The main canal having a length of 43,288 feet is under construction. After completion, the total length of the main canal will be 70,000 feet. Out of 27 distributaries and minors, 7 have been completed, and construction of the remaining ones is in progress.

1. Statistical Abstract of Orissa, 1963—p. 594

2. Small Farmers Development Agency, Dhenkanal District (1970) pp. 10-12

The project now irrigates 5,000 acres during Khariff and 950 acres during Rabi seasons. After completion of the project, the irrigable area is expected to be 16,000 acres during Khariff and 8,000 acres during Rabi.

45. Soil Conservation

(i) Soil Conservation Demonstration Centre, Angul

A social conservation demonstration centre has been established in 1953 over an area of 55 acres (22 hectares) at Panchamahar near Angul in the catchment of Nigra river to demonstrate to the people of the locality the benefit of taking soil conservation measures and proper land use programme. Local problems of soil conservation in the Nigra area are studied in this centre. It also executes the contour-bunding work in farmers' field, tree plantation in Government waste land, and stream-bank erosion control measures. Till 1961-62, contour-bunding was done for 1,544 acres (625 hectares), tree plantation in 400 acres (162 hectares) and control of stream-bank erosion was done in 64 acres (26 hectares).

The centre has a nursery of 10 acres (4 hectares) to meet the requirements of seed and seedling in Community Development Blocks, and of its plantation for soil conservation.

(ii) Soil Conservation in Brahmani Catchment

The Brahmani catchment comprises an area of 8,550 square miles (22,144.5 Sq. Km.). It is a problem river and almost every year the crop lands, orchards and villages are damaged by flood. The catchment area of river Brahmani is badly eroded due to practice of shifting cultivation by the tribal people.

During 1962-63, soil conservation programme was taken up in the sub-catchment of river Ramiala in Kamakhyanager Subdivision. Subsequently it was extended to the following sub-catchments:

(i) Sankh	.. 496 Sq. miles (1,285 Sq. Km.)
(ii) Singdajhor	.. 208 Sq. miles (539 Sq. Km.)
(iii) Barjhar	.. 258 Sq. miles (668 Sq. Km.)
(iv) Samakoi	.. 624 Sq. miles (1,616 Sq. Km.)

In the above sub-catchments, comprehensive soil conservation measures were executed on the crop lands waste lands, and village and Khesra forests. The cultivated uplands were contour-bunded. The wastelands were planted with trees of Sisoo, Gambhar, cashew-nut, teak and bamboo. The gullies were reclaimed and farm ponds constructed.

Till the end of 1969-70, various soil conservation measures have been taken which covered 10,722 acres of land, namely, contour-bunding in 7,044 acres, tree planting in 1,998 acres and other measures in 1,680 acres. Also, 8 units of gully control structures have been completed.

46. Soil

The following types of soil are found in this district.

(i) Alluvial Soil

The soil is found in all the river valleys. Sugar-cane, tobacco, paddy, vegetables and fruits thrive well in this soil. Pulses and oil-seeds are also grown during Rabi season.

(ii) Black Clay Soil

It is found mostly in Angul Subdivision, and in patches throughout the district. The soil is very congenial for the growth of various Rabi crops, oil-seeds and pulses and is most suitable for growing orange and other citrus fruits. Paddy and vegetables are also grown to some extent

(iii) Red Loam Soil

The soil is found in high-lying areas and hill slopes all over the district. This is suitable for growing groundnuts, mesta, sweet potato and cotton. In the irrigated lands of Angul and Pal Lahara, orange and lemon are grown luxuriantly on this soil.

(iv) Sandy Loam Soil

This type of soil is found in patches throughout the district. Rabi crops and vegetables are grown on it in rainy season.

(v) Gravelly Soil

Mangoes, jack fruits and guavas grow on this soil, which is found in hill slopes.

(vi) Cleaving Loam Soil

This is found all over the district and is utilised for paddy cultivation. Rabi crops like Mung and Khesari are also raised on it.

(vii) Calcineous Soil

The soil is found in small patches in some parts of the district and is not suitable for any vegetation.

47. Classes of Land

O' Malley* gives the following description of various types of land in Angul which is more or less applicable to the present district of Dhenkanal:

“There are four classes of lands, known as *sarad*, *harfasal*, *bazefasal* and *toila*, the meaning of which may be gathered from the following account of the way in which land is ordinarily brought under cultivation. First of all the jungle is cut and burnt on the land, which is then ploughed up, the ashes of the jungle being ploughed into it. It is then sown with

*. L. S. S. O' Malley—Angul District Gazetteer (1908) pp. 91-92

early rice, cotton or a pulse crop, and good harvests are produced for three years without any further manuring. Such newly reclaimed land is known as *toila*. After three years if the ryot is able to apply cow-dung or other manure he does so and the land continuing under cultivation is known as *bazefasal*, which is simply reclaimed upland brought and kept under cultivation by manuring and careful tillage. If however the ryot is unable to apply manure, the land is allowed to remain uncultivated, in the course of time it lapses back into jungle and after three or four years is again brought under cultivation by the process above described”.

“In *bazefasal* land prepared in this way ordinary *rabi* and *bhadoi* crops, such as mustard, maize and the castor oil plant, are grown. If it is situated in the immediate neighbourhood of and intermingled with village sites, where it receives good manuring, it is known as *harfasal* which is practically homestead land, while *bazefasal* corresponds with *bhita* or uplands of Bihar. *Toila*, as stated above, is land recently reclaimed from jungle and may be high or low. Thus, if a ryot breaks up and reclaims low land, he may allow it to go out of cultivation, and in that case it still continues to be called *toila* ; but if he surrounds it with low banks or ridges, has it irrigated, and makes it suitable for paddy cultivation, it becomes *Sarad* and is classed as such.

“*Sarad* or rice land is further sub-divided into three classes. The first class is called *nali* or *berna* and consists of low-lying land situated between ridges, within hollows, below dams and dykes, or near springs and water courses ; this is the best land for rice and it always remains moist. The second class which is called *dera* or *majhighatia*, consists of land somewhat inferior in quality situated on slopes or above the *nali* land. The third class consists of land known as *pasi* or *dhipa*, i. e., land on high levels, which receives no irrigation and is entirely dependent on the rainfall.

“*Harfasal* and *dofasal* lands are lands surrounding the village homesteads on which double crops are grown, and include vegetable gardens, plantain groves, and *pan* plantations. *Bhadoi* crops such as maize, *sawan* and *mandia* are first raised on lands of this class, when these have been reaped, tobacco, mustard, ginger, brinjals, onions, chillies, etc., are planted. *Bazefasal* lands are generally situated in the vicinity of the village and like *harfasal* are usually manured. They grow single crops such as maize, tobacco, brinjal, mustard, *saru* or arum, and the castor-oil plant.

“The *toila* lands are the high lands, other than rice fields, situated at a distance from the village homesteads, which are sometimes allowed to lie fallow for a year or two in order that they may recover fertility. They are of three classes, viz., first class or *dofasal*, second class or *ekfasal*,

and the third class land consisting of sandy or gravelly soil, which is sown in alternate years. In land of the first class *biali* rice and *harar* or *arhar* are sown together, and after the former is reaped, *birhi*, *kulthi*, or a *Bhadoi* crop of *tila* (known locally as *maghi rasi*) is sown. Sometimes also gram, coriander (*dhania*) and *muga* (*Phaseolus radiatus*) are sown as single crops. On second class *toila* land *maghi rasi*, *birhi*, *arhar*, *muga*, cotton and the castor oil plant are sown; and on third class land *kulthi*, *maghi rasi* and sweet potatoes (*Kandmul*), and to a very small extent *bhadoi* cotton are grown.

“Among other terms current may be mentioned *halparia* or current fallow, i. e., fields cultivated within the last three years, *punparia* or old fallow uncultivated for over three years or upwards, and *laikparia* or culturable waste never cultivated but fit for cultivation”.

48. Crops

The total cultivated area during 1968-69 was about 450,000 hectares (1,110,000 acres). A statement showing areas under various crops and their yield has been given as Appendix II to this Chapter. Most of the cultivable area of the district is single cropped. Only on a limited portion of the land *Rabi* crops are raised besides the main *Khariff* crops. The crops may be divided into two main groups as follows:

(i) Kharifi Crops

Paddy, maize, Jowar, millets, Arhar, Birhi, Mung, groundnut, til. mesta, cotton, jute, turmeric, ginger, pumpkins, sunhemp, ashgourd, cucumber, Jhinga, etc.

(ii) Rabi Crops

Wheat, Kulthi, gram, Jhain Mung, Khesari, peas, til, castor, mustard, niger, sugarcane, tobacco, potol, potato, brinjal, pumpkins, beans, onions, cabbage, chillies, etc.

(iii) Rice

The most important of all crops is rice which covers about 80 per cent of total cultivated area. During 1968-69, area under paddy was 296,723 hectares and the rate of yield was 11.85 quintals per hectare. About 300 varieties of paddy are cultivated, which can be divided into three main groups, viz., Sarad or winter rice, Ashu or Biali rice and Laghu—literally meaning light rice.

The greater part of the paddy consists of Sarad or winter rice which is mostly cultivated on low lands. Ashu is a *Bhadoi* or autumnal crop sown and reaped during the rains and Laghu is an early variety grown on second and third class Sarad lands found on slopes and uplands. The broadcast method of cultivation is popular in the district. About 90

per cent of paddy lands are cultivated in this method and the rest of the lands are cultivated in transplantation method. Japanese method of cultivation has been introduced in this district which is yet to become popular among the people. Want of sufficient irrigation is a handicap and the farmer who is left to depend on monsoon hesitates to take a risk as this method requires more investment. Improved agricultural practices are being introduced in a slow but steady manner.

(iv) Pulses

Arhar or the pigeon pea (*Gajanus indicus*), Birhi (*Phaseolus Mungo*), Mung (*Phaseolus radiatus*), Khesari (*Lathyrus sativus*), Gram, Kulthi or horse gram (*Dolichos biflorus*), and Chana or the field-pea (*Pisum-arvense*) are the principal pulses cultivated in the district. 55,402 hectares of land were under cultivation of different pulses during 1968-69, and yield rate was 4.51 quintals per hectare. Arhar is taken as a mixed crop with early Biali paddy and is sown towards the end of June as a subsidiary crop on toila lands with sandy loam or red loam. Manuring is not generally taken up. Birhi and mung are sown (by broadcasting) on high lands as single crop towards mid-July. Jhain Mung and Khesari, are cultivated as second crops after paddy.

(v) Oil Seeds

Groundnut, mustard, castor, sesamum and linseed are the notable oil seeds produced in this district. During 1968-69, 30,277 hectares were under cultivation of various oil seeds. For area break-up and yield rate, see Appendix II to this Chapter.

Oil-seeds like groundnut, castor, til and mustard are extensively cultivated in Angul Agricultural district.* Linseed and niger are cultivated only in Pal Lahara. Groundnut, Castor and Til grow during Khariff season under rain-fed conditions. Mustard, linseed and niger are cultivated during Rabi season with lift irrigation from streams, tanks or wells. Groundnut Seed Multiplication Scheme has been implemented from 1966-67. Loans in shape of seeds, fertilisers and pesticides are supplied to cultivators who repay the loans in shape of seeds. These seeds are again diverted to other districts for launching the seed multiplication programme.

(vi) Wheat, Ragi and Maize

During 1968-69, 190 hectares were under wheat cultivation, 3,621 hectares under Ragi cultivation and 3,986 hectares under maize cultivation. Maize is grown in Khariff season on homestead lands and hill slopes as a dry crop and as a garden crop in Rabi season.

*. Composed of Angul, Banarpal, Chhendipada, Talcher, Kaniha, Athmallik, Kishorenagar, and Pal Lahara C. D. Blocks.

Wheat is grown as an irrigated crop in Athmallik, Kamakhyanagar and Angul subdivisions. It is sown in Rabi season, towards the middle part of October.

(vii) Fibre crops

The important fibre crops of the district are cotton, jute and mesta. During 1968-69, 3,149 hectares of land were under cultivation of these crops.

Cultivation of mesta has become popular among the farmers of the district. About 3,086 hectares of land were utilised for its cultivation during 1968-69 and 13,021 bales produced. Bimalai mesta a late crop is gradually replacing the local variety, as it is giving more yield which is about 8 to 10 quintals of fibre per hectare. It is grown mostly in Kamakhyanagar subdivision.

(viii) Sugar-cane

This is one of the important cash crops of the district. It covered an area of 2,780 hectares and 17,628 metric tonnes of *Gur* were produced during 1968-69.

Sugar-cane plantation requires thorough preparation of the soil for which heavy cowdung manuring is made without top dressing. Fertilisers are seldom used. Improved varieties have been introduced and are grown throughout the district.

(ix) Tobacco

Tobacco is not cultivated on a large scale in this district. Only 478 hectares (1968-69) were under cultivation. Transplantation is done in September on *khas* lands which are generally fertile. The yield per hectare was 3.49 quintals of dry leaf.

(x) Vegetables

Khariff vegetables are grown on uplands, hill slopes and on well drained Khariff lands. Basal dressing of cowdung is given and fertilisers are also applied. Lady's finger, snake-gourd, bottle gourd, pumpkin, brinjal, ridge, gourd, arum and cucumber, etc., are produced as rainy vegetables. 17,981 hectares of land were under cultivation of vegetables during 1968-69.

Rabi vegetables are transplanted earlier for early marketing. Transplanting commences in August. Compost, oil-cake and chemical fertilisers are applied while preparing the fields. Cabbage, cauliflower, radish, knolkhol, bean, tomato and brinjal are produced as winter vegetables.

During 1968-69, 1,323 hectares of land were under potato cultivation. Compost, oil-cake, super-phosphate, Ammonium sulphate, etc., are applied and the plantation is done during mid-October to mid-November. The cultivators generally prefer the early varieties, which yield about 40 quintals per hectare.

(xi) Fruits

Fruit plants like orange, guava and jack fruits are raised from seeds and planted at the commencement of rains without any manuring. Now people have become conscious of the profitability of growing various fruit trees, as a result of which there is extensive plantation of mango and other grafts. There is a number of fruit farms in the district which have been described elsewhere in this Chapter.

The scope for extension of horticulture is already there. In this connection, the following is quoted from the report of Small Farmers Scheme*. "This district has enough scope for the development of horticulture in Angul, Pal Lahara and Athmallik. The climate of these areas are very much favourable for the growth of citrus, grapes and other such fruits. The small farmers who are unable to grow paddy and other cereals in the dry lands may be encouraged for plantation of fruit orchards, namely, Mango, Jack fruit, Orange, Banana and Grapes. The cost of cultivation per acre is estimated at Rs. 500. The high land around Kapilas hills is very suitable for growing mango plants as the area is not at all suitable for paddy or other crops. In the ex-State regime mango groves were very much developed and these have been thinned out to a large extent. In Pal Lahara and Athmallik areas too, the agro-climatic conditions are very suitable for development of fruit orchards and the productions can find way to neighbouring urban centres of Angul, Dhenkanal, Talcher and even of Sambalpur and Cuttack".

49. Agricultural Implements

Country made age-old agricultural implements are prevalent throughout the district. They are wooden plough, wooden leveller, *Bida*, wooden scraper, sickle, *Phowrah*, *Koduli*, etc. The purposes for which they are utilised are given below :

- | | |
|--------------------|---|
| 1. Wooden plough | .. Used for tilling soil |
| 2. Wooden leveller | .. Used for levelling land after ploughing. |
| 3. <i>Bida</i> | .. Used for thinning paddy seedlings. |
| 4. Wooden Scraper | .. Used for scraping soil. |

* Small Farmers Development Agency, Dhenkanal (1970),—p. 26

5. Sickle .. Used for harvesting paddy and other field crops.
6. *Phowrah* .. Used for digging and cutting the soil.
7. *Kodali* ..(Same as phowrah), used for deep digging and cutting the soil.

The farmers are gradually becoming acquainted with modern implements. Number of various agricultural implements, available from statistical reports *, is given below :

Wooden plough	..	136,725
Iron plough	..	940
Sugarcane crusher (bullock-driven).		508
Carts	..	59,745
Oil engines	..	73
Electric pumps for tube-wells	..	2
Tractor	..	2
Oil crusher (Ghani)	..	779

50. Seeds

The farmers require improved seeds of different crops and vegetables. In the past they were not always getting seeds and seedlings of improved quality. Modern agricultural science has made it easier to produce and preserve improved seeds for the development of agriculture. During the last several years, large quantities of seeds have been supplied by Government to cultivators. A statement showing the quantities of seeds distributed from 1967-68 to 1969-70 has been given as Appendix III to this Chapter.

Multiplication of seeds are carried on in Government seed farms. These farms are situated at Damsal, Gondia, Gatikrishnapur, and Sargipali and the fruit orchards are located at Nakchi, and Pal Lahara. The farms supply improved seeds and grafts.

Every Grama Panchayat has got one graingolla where paddy seeds, supplied from the Government seed farms, are stored. These are supplied to the cultivators either on cash or on loan.

*Statistical Abstract of Orissa, 1963—p. 675-676

High yielding varieties of the following crops are grown in the district:

- | | | |
|----------------|----|---|
| (1) Paddy | .. | <i>Padma. Jaya</i> J.I. R. 8. <i>Bala. Ratna. Krishna, Pankaj</i> and I. R. 8-68. |
| (2) Pulses | .. | <i>Pusabaisakhi</i> Mung, <i>Koopergram</i> Mung, T-65 Biri, B-1 Mung and <i>Arhar-7</i> . |
| (3) Oilseeds | .. | Ak-12-24 groundnut, S. B. 11 Til, SL-14 Til, T. M. V. 3 groundnut, T. 14. V. 2 groundnut. |
| (4) Wheat | .. | <i>Kalyanisona, Safedlasona, Sonalika</i> and <i>Sonera-64</i> . |
| (5) Ragi | .. | A. K. P. -1, A. K. P. -2, A. K. P. -3. |
| (6) Maize | .. | <i>Kenduguda, Ranjit, Ganga</i> No. 101 |
| (7) Sugarcane | .. | Co. 419., Co. 421, Co. 527, Co. 872, Co. 897 and Co. 997. |
| (8) Vegetables | .. | Up-to-date potatoes, <i>Kurifri Sundr</i> potato, Pusa green ladies finger, Pusa Sawani ladies finger, Best-of-all tomato Snow-ball cabbage, Pride of India cabbage, Pusa Kataki cauliflower, Indian snow-ball cauliflower, Early winter cauliflower. |

51. Manures and Fertilisers

Manuring is practised widely. Cow-dung, oil-cakes and silt of old tanks are commonly used as manures. The quantity of cow-dung and other organic manures available in the district is insufficient to meet the requirements of soil. Now the use of chemical fertilisers like ammonium sulphate, superphosphate, calcium, urea, and ammonium nitrate is increasing. The main drawback of extensive use of fertilisers is want of proper irrigation facilities. Green manuring is gradually gaining popularity. Dhanicha and Sunhemp seeds are being supplied to the farmers. A statement showing the distribution of fertilisers from 1967-68 to 1969-70 has been given as Appendix IV to this Chapter.

52. Rotation of crops

The rotation of different crops usually followed in this district is as follows :

Kulthy, black Mung, Birhi, wheat, Rabi vegetables or sesamum are grown after Biali paddy, wheat, Mung or vegetables are grown after medium paddy, Mung or Khesari are grown after late paddy and groundnut is generally followed by *Dhania* (Coriander) or gram in back cotton

soil. Along with Biali paddy, Arhar and Mesta are cultivated and mustard is cultivated with Mung as well as with Khesari. Arhar is mixed with groundnut.

Lands situated under the command of perennial water sources and irrigation projects have undergone some changes so far as their crop patterns are concerned. For instance, in an area under the *ayacut* of Damsal project early paddy is grown, followed by vegetables and further medium or low paddy is grown followed by Jhain mung and then by jute. Otherwise, the area under double cropping in the district is very small.

53. Crop diseases and pests

This district has not faced any major attack of pests and other crop diseases in the past. Several steps are taken to control the pests and diseases. Each Community Development Block has been provided with sufficient quantities of insecticides and pesticides for making them available to cultivators at times of need. Sprayers and dusters are also stocked in those Blocks. The Grama Panchayats are also supplied with dust gamaxene, and dusters and sprayers. The demands for the use of gamaxene is on the increase.

The following statement shows the crop diseases and pests common to the district :

Crops	Pests / Diseases
(1)	(2)
1. Paddy	.. Gallmidge, Jassids, Stem borer, Caseworm, Mealy bug, Bacterial leaf blight, Blast, Helminthosporium.
2. Wheat	.. Stem borer, Rust
3. Sugarcane	.. Shoot borer, Red rot
4. Potato	.. Blight, Cut worm, Termite
5. Groundnut	.. Tikka disease, Collar rot, Termite
6. Maize	.. Stem borer
7. Pulses	.. Gram caterpillar
8. Vegetable	.. Epilachna Beetle, Cutworm, Shoot borer, Aphids.
9. Mustard	.. Aphids

54. Agricultural Farms

At present, there is a Citrus Fruit Research Farm at Angul and seven agricultural farms at various places of the district, descriptive account of each are given below :

(i) Citrus Fruit Research Farm, Angul

Located at Angul over an area 27.28 acres, where different experiments are conducted on citrus fruits and allied species. Grafts are also prepared and supplied to the people. The farm was started in 1942.

Up to the 31st October, 1961, it functioned as one of the main research stations in India for research on citrus fruits. Thereafter, it ceased to be a research station as the Indian Council of Agricultural Research stopped giving financial assistance. It remained as a general farm up to 1968 producing only grafts and seedlings. During this period (1961-68) it was under the control of District Agricultural Officer. From 1968, it has begun to conduct research under the control of Horticulturist, Orissa. It has started research on grape cultivation on 50 cents of land. About 21 varieties of grapes are under experiment. The results of experiment are reported to be good. Of all, the following 11 varieties are growing well—*Anab-e-Shahi*, *Black prince*, *Bhokri*, *Schular white*, *Karachi Gulabi*, *Gulabi*, *Himrod*, *Maidan*, *Ajwain*, *Pulette*, and *Khallil*. Of these, *Bhokri* yielded the best result.

Besides grape experiments, other experiments in mango and citrus plants are also at work. Grafts of orange, mango, litchu, sapeta, pomegranate, and grape vine cuttings are produced here for supply to cultivators.

(ii) Pal Lahara Fruit Farm

It is situated near Pal Lahara town, having an area of 35.21 acres. Fruit trees, such as orange, litchu, mango and plantain are mainly grown here. A citrus nursery covering an area of 5 acres is attached to it. Grafts of fruit plants are prepared in this farm on a commercial basis. Before merger, this farm belonged to the ex-State of Pal Lahara but from 1948 it is being managed by the Agriculture Department of Orissa Government.

(iii) Nakchi Farm

It is located on the left side of Cuttack-Sambalpur road (National Highway No. 42) in Athmallik subdivision. The area of the farm is 48.68 acres. Plantain and sugarcane are the main crops cultivated here. Previously it was maintained by the ex-State of Athmallik and after merger it was transferred to Orissa Government.

(iv) Gondia Seed Farm

It is situated at Gondia, about 16 miles from Dhenkanal town, over an area of 33 acres. It was established in 1960 and only paddy is grown here with the purpose of obtaining improved seeds to be supplied to cultivators.

(v) Damsal Seed Farm

It was established in Damsal (in Kamakhyanagar subdivision) in 1960 over an area of 70 acres, situated near the Irrigation Project. The farm is irrigated by the Damsal canal and it produces improved seeds.

(vi) Gatikrishnapur Seed Farm

Situated in Athmallik subdivision, very close to Nakchi farm, over an area of 62 acres, the farm was established in 1960. Here paddy is grown for seed purposes.

(vii) Sargipali Farm

This is situated near Gatikrishnapur Seed Farm over an area of 40.17 acres. Garden crops are grown here.

(viii) Grama Sevak Talim Kendra/Agricultural Sub-Overseers' Training Centre

A farm, covering about one hundred acres, was attached to the Grama Sevak Talim Kendra at Mahisapat to help trainees to gain farm experience. The farm, started in 1954, is situated in a mountain valley 3 miles from Dhenkanal town. After abolition of the Grama Sevak Talim Kendra on the 30th September, 1968, an Agricultural Sub-Overseers' Training Centre has been started here from the 15th October, 1968. The duration of training is one year. The trainees get monthly stipends of Rs. 45. During 1970-71, there were 18 trainees and one Instructor. The farm is now attached to this centre.

55. State Assistance to Agriculture

State assistance to agriculture in terms of loans include Land Improvement Loans and Agriculturists' Loans (*taccavi*) which are governed respectively by the Land Improvement Act, 1885 and the Agriculturists Loan Act, 1884.

Land Improvement Loan is advanced for any work which adds to the letting value of land. The land improvement work includes construction of wells, tanks and other works for storage of water, preparation of land for irrigation, reclamation of land for agricultural purposes, etc.

The Agriculturists' Loan was primarily intended for the owners and occupiers of arable land as a matter of relief from distress, for purchase of seed or cattle or any other purpose connected with agriculture. Later, this loan was also advanced for rebuilding of houses of the agriculturists, if the houses were damaged or destroyed by flood.

Amounts of Agriculturists' Loan and Land Improvement Loan advanced to cultivators during the years 1965-66 to 1969-70 are given below :—

Year	Agri- cultural loan	Land Improve- ment Loan	Total
	Rs.	Rs.	Rs.
1	2	3	4
1965-66	2,37,890	27,500	2,65,390
1966-67	35,37,220	80,860	36,18,080
1967-68	2,86,000	83,410	3,69,410
1968-69	8,15,000	65,030	8,80,030
1969-70	41,000	10,000	51,000

56. Animal Husbandry

(i) General Condition

The condition of the cattle in the district is poor. Lack of sufficient feeds is one of the reasons for the under-development of cattle. There is no regular practice of fodder cultivation. It is only during rains that the cattle get sufficient grass from the pastures and forest areas. But after winter, it becomes scarce and the cattle remain underfed during the summer months. The principal fodder for the cattle is the straw of paddy which is also used for thatching of houses.

(ii) Fodder Cultivation

Every village of the district has its own pasture ground (Gochar). Cattle of all categories graze upon it throughout the year. In recent years, napier grass and guinea grass are being grown for demonstration in most of the Veterinary Dispensaries in the district.

(iii) Milk Supply

The district is poor in milk supply. Most of the people, specially cultivators, neglect cows and give preference to bullocks because of their utility in agriculture. The people were ignorant about the improved breeds and proper rearing of cattle until recent years. The urban population consume more milk than the rural. Persons belonging to Gardia (Milkman) caste deal in milk and milk products and carry on their business more in towns and big villages.

During rainy season, the cattle get enough fodder and yield more milk, but in dry summer months milk supply is reduced considerably.

In various places of the district people maintain large number of buffaloes for the purpose of obtaining *ghee*. Generally, a big herd is entrusted to a person who takes them to deep forests where grass is sufficient. He remains there with the animals for months together and produces *ghee* from milk. But this practice is gradually being discontinued and the number of milch she-buffaloes is also on the decrease.

A Co-operative Society has been formed in village Kaimati with selected cows of indigenous breed to supply milk to Dhenkanal town. The milk is collected under hygienic condition and under supervision of the Animal Husbandry and Veterinary Department, and is taken to Dhenkanal and Odapada for sale.

Several people in Kaimati area are applying for State aid for starting small-scale dairy units. The Industries Department is giving Rs. 2,000 as State aid to start such units. This will help the poor farmers to earn some money and at the same time increase milk production.

In 1958 a Gosadan was started at Babandh to give shelter to the unproductive and useless cattle, under supervision of the Animal Husbandry and Veterinary Department. 500 acres of land have been provided to the Go-sadan for pasture. The land is yet to be transferred to Animal Husbandry Department.

(iv) Sheep and Goats

Although there is no organised sheep breeding in the district, people rear goats and sheep mainly for mutton. According to live-stock census of 1945 there were 25,589 sheep and 98,313 goats in the district, whereas in 1957 the number was 34,714 and 85,329, respectively.

The live-stock census (1961) of the district has been given as Appendix V.

(v) Poultry

The people of the district rear poultry for personal consumption and also for trade. Generally they keep country breeds as they are easy to rear and are available throughout the district. The total number of poultry in the district during 1957 was 131,755.

For the improvement of poultry and propagation of improved and graded birds throughout the State one poultry farm, called State Poultry Breeding Farm, was started at Angul during 1951-52 by the State Government in an area of 91 acres with only 50 birds. At present there are 3,000 layers. Besides supplying breeding birds, day-old chicks, hatching eggs and table birds, this farm acts as a demonstration centre for rearing of improved birds.

A small poultry demonstration centre has been established at Talcher with 90 females and 10 male birds. This centre runs throughout the year to supply seed materials to poultry keepers in the area. Eggs from State Poultry Breeding Farm, Angul, are also sold in this centre.

Poultry units with 20 female and 2 male birds are started from October to March every year to supply hatching eggs in the locality during the winter months at the following veterinary institutions—Athmallik, Chhendipada, Dhenkanal, Gondia, Hindol, Kamakhyanagar, and Pal Lahara.

Under the self-employment scheme, one unemployed graduate in veterinary science has started a High-cross Breed Poultry Farm at Dhenkanal with the assistance of Canara Bank and the State Government. The farm has more than 12,000 birds. Another unemployed veterinary graduate has also started a small poultry farm at Mahisapat with the aid of State Government.

(vi) **Measures to improve quality of Breeds**

Cattle are maintained mainly for agricultural purposes. Cowdung is used for manuring and the farmer carefully collects and stores the dung. The Veterinary Department is taking steps to improve this cattle wealth by starting bull and buck centres in various places of the district. The people are now appreciating the need of better breeds. To improve the local breeds of cattle, Artificial Insemination Centres have been opened at Dhenkanal, Talcher, Khajuriakata, Rasol, and Hindol. For the same purpose 30 Red Sindhi bulls have also been kept at Kapilas and Gadasila under the Key Village Expansion Scheme. In the Block areas of Kamakhyanagar, Athmallik, and Talcher, pedigree bulls have been kept for better breeding. The Utkal Gomangala Samiti has also opened five bull centres.

(a) **KEY VILLAGE BLOCKS**

In order to improve the local cattle one Key Village Block at Talcher, with ten sub-units, was started during the years 1966-67 and 1970-71. One more Key Village Block at Angul with 10 sub-units has been sanctioned. The insemination of cattle at Talcher Key Village is progressing. To infuse milk yielding character in the local cattle the semen of jersey bulls is also being inseminated in these Key Village Blocks.

(a) **ARTIFICIAL INSEMINATION**

In order to popularise artificial insemination work in areas other than Key Village Blocks, 15 institutions of this district are conducting artificial insemination to the local cattle and several graded calves have already been detected.

(e) CATTLE SHOWS

To encourage people to possess improved breeds, progeny shows, calf rallies, and cattle shows are held in the district every year.

(vii) Animal Diseases

Among animal diseases, haemorrhagic septicaemia, foot and mouth disease, black quarter, and rinderpest are common in the district. The incidence of rinderpest is not severe as it can be prevented by Goat Tissue Vaccine. Haemorrhagic septicaemia and black quarter generally occur during rainy season. A large number of cattle are infected by foot and mouth disease but cases of fatality are few. Ranikhet disease and fowl pox are the principal poultry diseases. But the former is a virulent type of disease, which spreads rapidly and takes a heavy toll. A table showing number of attacks and deaths from animal diseases has been given as Appendix VI.

(viii) Veterinary Hospitals

There are now (1970) 5 Veterinary hospitals, 17 dispensaries and 81 stockmen centres. A list of all these institutions with locations is given as Appendix VII to this Chapter.

57. Fisheries

The district depends upon inland fisheries for the supply of fish. A limited quantity of salt water fish is imported from the fishing bases at Paradip and Chandbali. Since there are no storage facilities available at Dhenkanal, regular flow of fish is not possible. The tanks, *bundhs*, rivers and *nallas* are the main sources for fresh water fish. Fishing in minor irrigation projects has also been taken up by Government and by private parties. As river Brahmani is passing through the district, it is natural that a large number of fisherman villages are scattered along the river-side. The fishermen depend on *nallas* and rivers to earn their living.

The total water area belonging to Grama Panchayats is 9,203 acres and to Fisheries Department is 48 acres. The Fisheries Department started their activities in the district in 1947 with a centre at Angul besides the District Fisheries Office at Dhenkanal. In order to push up spawn culture and to supply fry to the public, 12 fish seed centres were opened during 1951—61. There are two Research Stations at Angul and Dhenkanal for carrying on research in fish-culture, induced breeding, soil and water analysis. Also, there are 13 stocking centres consisting of 163 tanks for nursery, and for stocking of fry and fish. At first, the demand of fry was about 6 lakhs. In 1969-70, the demand was 22.67 lakhs. To cope with this demand, experiments at Angul Fish Farm were conducted to produce pure seeds by artificial breeding of major Indian carps like *labeo rohita*, *catla-catla* and *cirrhina mrigala*.

Bundh type of breeding, the first of its kind in Orissa, was successful during 1967-68 at Angul Fish Farm. Cy. Carpio (Bilati Rohu) breeding experiments are conducted at this farm which has attracted large number of pisciculturists. Riverine spwans are also collected from river Brahmani. From 1967, the district has been exporting spwan and fry to districts like Baudh-Khondmals, Sundargarh, Mayurbhanj, Ganjam, and Keonjhar.

(i) Fish Supply

Generally, fish is supplied from river and tanks maintained by Fisheries Department in Angul and Dhenkanal sub-divisions, and also from tanks belonging to Grama Panchayats and private parties.

ii) Varieties of Fish

The fresh-water fish that are available in the market of the district are :

Catla catla (Bhakur), *Labeo Rohita* (Rohu), *Cirrihna mirgala* (Mirkali), *Labeo Calbasu* (Kalabainsi), *Labeo bata* (Raj Pohola), *Cirrihna reba* (Chunchia Pohala), *Cy. Carpio* (Bilati Rohu), *Mystus singhla* (Ardi), *Wallago attu* (Balua), *Mystus Cavasisu* (Kantia), *Notopterus notopterus* (Pholi), *Notopterus chitala* (Chitla), *Barbus Spp.* (Kerandi) *Ophicephalus straitus* (Seulo), *Ophicephalus gachua* (Baligirida), *Palaemon rudis* (Chinguri), and *Palaemon rossenbergii* (Golda chinguri).

(iii) Implements for catching Fish

Local fishermen use the traditional fishing nets made of twine. Recently, they have taken to nylon nets. The Fisheries Department have modified the nets. These are selected and introduced according to requirements and their use explained to fishermen. The traditional fishing implements like Baja, Happa, etc., are still being used besides nylon nets. Baja and Happa are used in shallow water. There has been a gradual drift towards use of nylon nets because nylon proved to be light, durable and easily driable.

58. Forestry

The district has extensive forests mostly of tropical dry deciduous type covering 2,453'28 square miles, of which 1,243'93 square miles are reserved forests and 1,209'35 square miles protected forests. The area of the district is 4,226 square miles and forests occupy about 58 per cent of this area. Details of forest vegetation have been given in Chapter I.

(i) Economic Importance

Forests play an important role in the economy of the district. Forests prevent soil erosion and greater run-off of water. Forests regulate the flow of rivers and to some extent check floods. Besides helping regulation of water-supply, they provide sustained feeding for springs and render the flow of water in rivers and streams perennial.

An agricultural district like Dhenkanal gains much from forests. Not only is the supply of rain water increased and soil erosion checked, but vast quantities of fodder are also obtained from forests. Large quantities of edible fruits, shoots and roots are available in forests. These constitute the main food of poor people in times of scarcity. Bamboo shoots provide food for the tribal people for several months.

Dwelling houses are constructed by timber and bamboo and are thatched with forest grass. The farmer depends on forests for his agricultural implements. The supply of domestic fuel wholly comes from forest. Large number of people get daily employment in forests in felling of trees and bamboos, transport of forest produce, plucking of Kendu leaves, and in various other forest exploitation work. Also, forest provides a suitable grazing ground for the livestock. Forests, therefore, wield considerable influence on the economic life of the people.

The principal forest-produces are timber, fire-wood, bamboo, and Kendu leaf. The minor forest-produce consists of lac, Genduli gum, catechu, honey, wax, Siali leaves, myrobalans, Sunari bark, mahua flower and seeds, tassar cocoons, Kochila (*nux vomica*), etc.

The forests contain valuable timbers predominantly of Sal, which fetch considerable forest revenue. The main consumer of timber is the Railways and that of bamboos is the Titaghur Paper Mills. There is also Kendu leaf which now fetches the highest forest revenue. From this source alone, Government earned a revenue amounting to Rs. 2,516,621 during 1967-68 and Rs. 4,239,992 during 1968-69. It yielded about 33 per cent and more than 44 per cent of total forest revenue during those two years respectively. And the major portion of this revenue came from forests of Athmallik. The following statement shows the revenue earned from forests in the district :

Name of the Forest Division	1967-68 Rs.	1968-69 Rs.
1	2	3
1. Angul ..	15,08,165	15,54,504
2. Dhenkanal ..	11,80,424	16,50,670
3. Athmallik (Part of Rairakhol division) ..	41,50,127	50,64,264
4. Pal Lahara (Part of Deogarh division) ..	8,48,342	12,65,916
Total ..	76,87,058	95,35,354

(ii) Forest Management and Exploitation

Forests are managed according to working plans. Every Forest Division has its own working plan and the forest management is done according to prescriptions laid down therein. Those prescriptions are carried out under supervision of technically trained staff of the Forest Department.

In the district, forests of Angul division are being managed on scientific lines from 1883, of Dhenkanal division from 1928, of Athmallik from 1919, and of Pal Lahara from 1947. For the forests of Talcher ex-State (now under Angul Division) there was no working plan, and they were being managed according to instructions issued from Dr. H. F. Mooney, the then Forest Adviser of Eastern States Agency. Later (about 1960-61) a working scheme was drafted.

The exploitation of forest has all along been done through the agency of contractors. The forest-produce are sold on auction to contractors in coupes or demarcated areas of reserved forests laid down in a carefully worked out scheme or working plan. After they are sold to highest bidding contractors, they are worked over a number of years called 'rotation'. The coupes are again divided into various types of fellings by which trees are removed or cleared by scientific selection and investigation.

For management, forests have been divided into three classes, namely :

- | | | |
|--------------------------------------|---|--|
| (i) Reserved Forest 'A' Class | } | (Demarcated by boundary lines with pillars). |
| (ii) Reserved Forests 'B' Class | | |
| (iii) Undemarcated Protected Forests | | |

According to prescriptions of working plans, the reserved forests are again sub-divided into various working circles, such as, (i) Selection Working Circle, (ii) Coppice Working Circle, (iii) Plantation Working Circle, (iv) Bamboo Working Circle, (v) Protection Working Circle, and (vi) Minor Forest Produce Working Circle.

The forests coming under Selection Working Circle are high forests situated in comparatively inaccessible areas far from markets and centres of consumption. Only selection fellings are adopted for these forests. In other words, only selected trees of exploitable girth are prescribed for felling. These forests are worked under a rotation of 20 years.

The Coppice Working Circle consists of forests which are more accessible and meet local demands for timber and fire-wood. Here, clear felling is adopted with some standards. Trees are felled in long rotation

in areas which are capable of producing large-sized timber and in short rotation in areas where Sal forests of poor quality or mixed forest grow.

Plantation Working Circle includes forests of inferior species, the timbers of which are not of much commercial value. So the trees from such areas are clear-felled and replaced by regular plantations of valuable species like Teak, Gambhar, Sissoo, Simul, etc. This is done to feed various forest-based industries.

Bamboo Working Circle generally overlaps other working circles where bamboo occurs. Saliabans (*Dendrocalamus strictus*) are worked under a felling cycle of 4 years, whereas the felling cycle for Kantabans (*Bambusa arundinacea*) is 12 years.

No felling is prescribed in Protection Working Circle. Forests in this circle consist of miscellaneous trees or low grade forests occurring on hill slopes, whose retention is silviculturally desirable. Such forests are not worked until they are capable of yielding some produce.

Minor Forest Produce Circle overlaps all other working circles and is worked for better exploitation and utilisation of different minor forest products.

As stated earlier, the usual method of sale of forest produce is done by public auction. The highest bidder works the forest coupes under the general conditions regulated by Orissa Forest Contract Rules.

The Orissa Forest Corporation has entered the field of forest marketing in 1963-64 in Dhenkanal Forest Division, in 1965-66 in Talcher forests, and in 1968-69 in Athmallik forests. The corporation has taken several coupes on lease and is working on them. The Titaghur Paper Mills has taken long-term leases for exploitation of bamboo. The minor forest-products are disposed of under lease or on permits.

Kendu leaves are being settled directly by Government. The Kendu leaf forests have been divided into units and for each unit Government appoint agents and purchasers after calling for tenders. The agents collect Kendu leaves by engaging labourers. After collection, the leaves are processed in their godowns and packed in bags of standard size. Then the purchasers transport them to market. The collection and purchase of Kendu leaves are regulated by the Orissa Kendu Leaves (Control of Trade) Act, 1961.

(iii) Rights and Concessions

The local tenants, who pay *nistar* cess, are allowed certain concessions to remove timber, firewood, bamboos, etc. from Khesra forests and 'B' class reserved forests for their *bona fide* personal use.

In 'A' class reserved forests they can graze cattle on payment of grazing fee, can collect edible roots, fruits and creepers free of charge for personal consumption, and can collect such forest-produce, which are not leased out, at one-fourth of scheduled rate.

In 'B' class reserved forests the cess-paying tenants can take timber of unreserved species free of charge and that of reserved species on payment of one-fourth of scheduled rate. They can also graze cattle on payment of grazing fee.

In Khesra forests, the cess-paying tenants have right to get timber of unreserved species and bamboo for house-building and for making agricultural implements. They have right to free grazing. They can collect honey and wax free of charge. They enjoy the right to flesh of wild animals killed by tiger and by wild dogs under information to Forest Officials.

(iv) Forest Training School

Located at Angul, the Forest Training School consists of two wings, namely, Mooney Forest Guards School and Foresters School. The former started in 1957 and the latter in 1963. There are 9 instructors in both schools including the Chief Instructor, who is the head of the institution. There is provision for training of 120 forest guards and 40 foresters. Duration of training for forest guards is six months and for foresters one year. None of them get any stipend. As they are all in-service trainees, they get their usual pay and allowances. The following subjects are taught—(i) Silviculture, (ii) Forest-utilisation, (iii) Forest Survey, (iv) Forest Engineering, (v) Forest Law, (vi) Forest Protection, (vii) Forest mensuration, and (viii) Accounts. The Foresters study two more subjects namely, Forest Management and Forest Botany.

59. Natural Calamities

This district is subject to visitations of flood and drought. The riparian tracts on both sides of the rivers Brahmani and Mahanadi are liable to flood. Ordinarily, the floods do not cause much harm. In years of exceptional rains, they are destructive to crops. The loss caused by floods is recouped by a bumper winter crop if it is not followed by an unusual drought.

Drought is a more serious calamity in the district on account of the undulating nature of the country and high porosity of surface soil. In the years of severe drought most part of the district, excepting the low lands and the irrigated areas, is affected. During the later part of the 19th century and the early 20th century, famines and scarcity occurred in Angul and the neighbouring areas. Accounts of these calamities are given below :

(i) Flood of 1868

One of the heaviest floods of the river Brahmani occurred in 1868 when flood water swept away a number of villages including Kirtanpur, causing great loss of life and property. The Brahmani, after continuous heavy rainfall, overflowed its banks on the 30th July, 1868. The flood did not subside for four days as the rain continued pouring.

(ii) Famine of 1889

"In the Angul Subdivision there had not been a good harvest of winter rice during the previous four years, while that of 1887-88 was on the average not more than 6 annas and that of 1888-89 not more than 8 annas of a normal crop. Considerable distress was reported in the autumn of 1888, and some measures of relief were adopted, the most important of which was the relaxation of the forest rules, but a copious fall of rain in September so improved the condition of things that measures of relief were gradually discontinued, except that the forest rules were not reimposed. In spite of this rain, however, the rice crop was an indifferent one, and a large portion of the higher land was left untilled, for there was great drought from October till the following May. The *mahua*, mango and palm crops failed both in Angul and the adjoining States, and early in the year the agriculturists found themselves unable to keep the field labourers in their service and discharged them. The latter were thus suddenly thrown out of employ, and were unable to find work elsewhere. In ordinary years they might have subsisted for sometime on edible roots, fruits, etc. of the jungles, but unfortunately in this year jungle produce also failed or became very scarce. The labourers, therefore, being suddenly deprived of all sources of subsistence could only be supported by special measures until a demand again arose for their services.

"The majority of the cultivators were in far better condition owing to the stocks of grains they held in reserve, but some were reduced to abject want, having sold a considerable portion of their slender stock at high prices to find subsequently that they had to buy grain for their sustenance at a much higher price. In many cases, they parted company with their last piece of gold and silver, with their brass ornaments, and with the last utensils of their household, and a few actually sold their plough-bullocks. The distress during the months of April and May and part of June was naturally at its height, there being no work available in the fields, while a severe epidemic of cholera broke out. In the later part of June, however rain fell, and there was fresh vegetation and at about the same time organised measures of relief were set on foot.

Accounts of famines in 1889 and 1897 taken from L. S. S. O' Malley, Angul District Gazetteer (1908) pp. 99-102.

The hopes of the people revived; the landless classes obtained agricultural loans, the able-bodied labourers found work, the infirm or helpless of both sexes received gratuitous relief and jungle produce became again procurable. In this manner the people continued to live till the maize and millet crops, which happily yielded a bumper out-turn, were gathered. They were followed by the early rice crop which was also an excellent one. By this time the labourers were getting their usual work, the price of foodgrains had begun to fall and relief operations were gradually reduced, until they were closed entirely in November when the early winter rice crop was harvested.

“Briefly, this, the greatest famine within the memory of the present inhabitants since the great Orissa famine of 1866, was due partly to the short harvests of 1887 and 1888, partly to the failure of the mango and *mahua* crops in 1889, and partly to the effects of a long drought which prevailed from October, 1888 to the end of May 1889, on account of which all grain was tightly hoarded for some months, and the labourers were deprived of employment. The total cost of relief measures in the Angul subdivision amounted to Rs. 36,430, including agricultural loans to the extent of Rs. 12,590”.

(iii) Scarcity of 1897

“There was some distress in 1897 due to the partial failure of crops in the Angul subdivision. In 1896, the rainfall was favourable until the middle of September, but after that it ceased till November. The injury done to the winter rice crop by this sudden cessation of rain at the time when it was most needed was aggravated by the visitation of an insect pest locally known *mahwa* (*Leptocorisa acuta*). The outturn of this crop was thus not more than 8 to 12 annas on the average. The distress caused by the partial failure of the rice crop was, however, not great and it was found sufficient to open a few relief works and to advance Rs. 20,000 in loans.”

In the year 1906 there was scarcity owing to short crop. Relief measures in the shape of gratuitous relief grant of loan were undertaken to relieve the distress.

(iv) Scarcity of 1908-09

The poor out-turn of crop due to short and uneven rainfall in the previous year coupled with the short rainfall in 1908 resulted in the scarcity of 1908-09. Relief operations were undertaken by Government to alleviate the distress of the people. Local development works were undertaken to provide labour to the able-bodied persons. Charitable doles were given to old and decrepit by Dharma Panchayats organised for the purpose. Taccavi loans were also advanced to the tenants and land revenue was remitted or suspended.

(v) Famine of 1918-19

In 1918-19, famine occurred due to total failure of rains and as there was also poor harvest in the previous year the condition of people became aggravated. The prices of foodgrains began to rise rapidly owing to the apprehension caused by scanty rainfall, moreover all means of supply from outside were almost suspended, while foodgrains were exported to Cuttack. The whole of Angul subdivision was affected uniformly and hardly 20 per cent of the population escaped from the rigour of famine. Various relief measures were undertaken to alleviate the distress of the people.

The district experienced natural calamities in the shape of drought and flood after 1948. An account of them is furnished below :

(vi) Droughts of 1954 and 1955

In 1954 the total rainfall in the district was 44.21 inches of which the period from May to September had an average monthly rainfall of less than 8 inches. Altogether 355 villages with a population of 215,071 were affected. The out-turn of crops that year was below 40 per cent of the normal yield.

In 1955 the main cause of drought was scarcity of rainfall in the early part of the agricultural season (i. e., June and July) throughout the district. The rain fall in July was only 6.79 inches and in August 4 inches on an average which was inadequate for paddy crops*.

As a result about 650 square miles of land and 244,716 persons were affected. The yield of crop that year was also below 40 per cent like the previous year. The Dhenkanal subdivision was the worst-affected area where only about 25 per cent of the normal yield was reported.

(vii) Flood of 1955-56

In 1954-55, the district suffered from drought which continued till the last week of August. Then there was an unusually heavy and incessant downpour which continued for a week ending on the 4th September, 1955. This rain caused heavy flood in many parts of Orissa which was unprecedented. The district of Dhenkanal also suffered from ravages caused by flood of the Mahanadi and the Brahmani.

There were as many as 114 breaches during 1955, when 40,696 persons of 356 villages were affected. 26,779 acres of cropped area was damaged and not less than 1,090 houses were completely destroyed by the flood. There was heavy casualty of the live-stock and as many as 960 of them were reported to be lost, while four persons were washed away by flood water.

* Drought in Orissa during 1954 and 1955—Final Report

During the flood of 1956, there were in all 10 breaches in the district. 43 villages having a population of 11,417 were affected and 750 acres of cultivated land were damaged.

Relief and Rehabilitation Measures

On account of the widespread calamity and general affliction of people of all classes, relief was given to them in various ways. Mid-day Meal Centres were opened for the children of school-going age in various localities. To provide employment to the able-bodied persons, various constructions and development works were undertaken by the Government during the period of calamity.

The year 1954 was a bad year for the crops on account of drought conditions. Cultivators were encouraged to raise a second crop and large amounts of money were distributed to needy cultivators under Agriculturists' Loan Act and the Land Improvement Loans Act. House building loans were also granted to the persons whose houses were damaged by floods and rehabilitation loans were given to the artisans or persons having petty business who were badly hit by the said flood. All rents due to the Government were suspended for the year 1955-56 and it was decided not to charge water rate during that period in flood-affected areas.

During 1955-56, an amount of Rs. 18,750 was advanced to 130 persons as loans and a grant of Rs. 60,950 was sanctioned to 3,133 persons for house building. Rs. 880 was given as rehabilitation grants to 29 persons.

APPENDIX I

List of Minor Irrigation Projects

Name of C. D. Block	Name of M. I. P.	Estimated cost (Rs.)	Date of construction	Designed Ayacut		Presently irrigated	
				Kharif (Acres)	Rabi	Kharif (Acres)	Rabi
1	2	3	4	5	6	7	8
ANGUL SUBDIVISION							
1. Angul	..	1,25,950	1963-64	1,070	300	650	..
..	1. Matalia	..	1963-64	1,070	300	650	..
..	2. Takua	3,09,100	1966-67	930	170	1,899	..
..	3. Bouli	14,67,200	1962-63	2,900	..	2,232	..
..	4. Chhotokoi	82,170	1963-64	154	50	141	..
..	5. Guranga	6,81,750	1963-64	450	50	450	..
..	6. Sabalabhanga	29,500	1963-64	248	..	242	..

2. Chhendipada	..	7. Kumbhira	..	2,21,166	1964-65	600	..	703	..
		8. Patrapara	..	9,94,597	1962-63	3,700	..	1,875	..
		9. Balibandha	..	4,09,830	1966-67	900	300	..	..
		10. Extn. to Patra para.		1,78,330	1967-68	1,770	..	..	..
		11. Jamajharan	..	50,000	1967-68	103	27	..	..
		12. Kukurpetta	..	14,99,300	1969-70	1,456	300	..	..

ATHMALLIK SUBDIVISION

3. Athmallik	..	13. Bileikhai	..	1,72,850	1965-66	550	150	226	..
		14. Jhillimunda	..	5,000	1966-67	450	50	273	..
		15. Laupal	..	5,98,200	1966-67	800	400	..	..
4. Kishorenagar	..	16. Sargipalli	..	87,100	1966-67	282	108	448	..
		17. Sushaba	..	2,47,260	1966-67	616	150	887	..
		18. Sureswari	..	2,80,840	1966-67	970	200	1,291	..
		19. Theloknali	..	1,55,000	1966-67	550	..	369	..

Name of C. D. Block	Name of M. I. P.	Estimated cost (Rs.)	Date of construction	Designed Ayacut			Presently irrigated		
				Kharif (Acres)	Rabi	Kharif (Acres)	Rabi	Kharif (Acres)	Rabi
1	2	3	4	5	6	7	8		
DHENKANAL SUBDIVISION									
5. Dhenkanal (Sadar)	20. Khalibandha	44,000	1964-65	40	..	77	..	..	..
	21. Badajora	1,54,100	1967-68	640	..	..	..	..	..
	22. Saptasajya	50,000	1966-67	140	10	..	..	..	..
6. Gondia	23. Dhamianali	3,83,120	1964-65	600	300	1,254	..	..	..
	24. Sorisiapada	50,000	1966-67	266	..	81	..	..	..
7. Odapada	25. Badhi	49,000	1966-67	1,200	..	81	..	..	..
HINDOL SUBDIVISION									
8. Hindol	26. Beruanapal	5,10,700	1964-65	612	..	523	..	..	..
	27. Panasapal	13,10,000	1964-65	1,200	..	947	..	..	..
	28. Kukupangi	1,05,829	1964-65	330	60	983	..	..	..
	29. Baradapal	5,22,700	1966-67	1,765	500	1,333	..	..	..
	30. Baunsapokhari	3,28,000	1966-67	670	150	..	..	..	..

KAMAKHYANAGAR SUBDIVISION

9. Bhuban	..	31. Damsal	..	8,07,560	1964-65	8,780	..	4,839	575
		32. Tangarpada	..	74,930	1964-65	100	..	77	..
		33. Extn. to Damsal..	..	4,69,000	1966-67	2,220	600	..	..
10. Kama khyanagar	..	34. Bhoiripur	..	82,700	1964-65	1,020	..	796	..
		35. Machhia	..	35,784	1964-65	60	..	66	..
		36. Rankia	..	1,23,000	1964-65	200	..	206	..
11. Kankadahad	..	37. Birasal	..	19,72,000	1967-68	900	100	504	..
12. Parjang	..	38. Mindhapada	..	3,26,900	1966-67	1,050	600	1,051	..
		39. Raghunathpur	..	84,420	1964-65	200	..	146	..

PAL LAHARA SUBDIVISION

13. Pal Lahara	..	40. Andhari	..	2,32,000	1966-67	200	..	..	..
		41. Dalo	..	1,29,353	1966-67	325	175	..	..

Name of C. D. Block	Name of M. I. P.	Estimated cost (Rs.)	Date of construction	Drsgined Ayacut			Presently irrigated	
				Khariff (Acres)	Rabi	Khariff (Acres)	Rabi	
1	2	3	4	5	6	7	8	
TALCHER SUBDIVISION								
14. Kaniba ..	42. Ghasiapasi ..	2,96,400	1964-65	1,020	..	796	..	
	43. Simajodi ..	1,42,000	1966-67	300	150	..	..
	44. Balijodi ..	1,64,850	1966-67	471	..	..	..
	45. Deojoda ..	1,31,000	1966-67	306	100	..	..
15. Talcher ..	46. Satyabadsagar ..	[3,51,200	1965-66	525	160	519	..	
Total				43,233	5,160	25,968	575	

Source—Rural Engineering Organisation, Dhenkanal

APPENDIX II

Area, production and yield rate of different crops for the Agricultural year 1968-69

	Area (in hectares)	Production (in metric tons)	Yield rate (in quintal per hectare)
1	2	3	4
1. Paddy ..	269,723	351,478	11.85
2. Wheat ..	190	172	9.05
3. Maize ..	3,986	1,648	4.18
4. Ragi ..	3,621	2,060	5.69
5. Jowar ..	69	29	4.20
6. Bazra ..	21	8	3.69
7. Other small millets ..	5,032	1,529	3.04
Total Cereals ..	309,642	356,924	11.53
8. Gram ..	506	253	5.00
9. Tur (Arhar) ..	2,313	1,279	5.53
10. Mung ..	19,742	8,633	4.37
11. Biri ..	13,511	6,614	4.90
12. Kulthi ..	8,027	3,211	4.00
13. Other Khariff pulses ..	10,935	4,842	4.43
14. Other Rabi pulses ..	369	138	3.74
Total Pulses ..	55,402	24,970	4.51
15. Groundnut ..	9,979	6,810	6.82
16. Til ..	10,023	3,557	3.55
17. Castor ..	5,512	2,271	4.12
18. Mustard ..	4,521	2,029	4.49
19. Linseed ..	100	45	4.50
20. Niger ..	142	43	3.00
Total Oilseeds ..	30,277	14,755	4.87
21. Potato ..	1,323	11,554	87.33
22. Sweet Potato ..	3,513	2,551	7.26
23. Onion ..	1,883	11,362	60.34
24. Other Khariff vegetables ..	4,255	..	..
25. Other Rabi vegetables ..	7,007	..	..
Total Vegetables ..	17,981	..	..

		Area (in hectares)	Production (in metric tons)	Yield rate (in quintal per hectare)
	1	2	3	4
26. Mango	..	6,394	81,862	128.03
27. Banana	..	451	2,255	50.00
28. Citrus Fruits	..	223	1,940	87.00
29. Papaya	..	33	533	161.42
30. Cashewnut	..	10	9	9.04
31. Coconut	..	15	9,500 (Nos.)	..
32. Other fresh fruits	..	1,665	..	..
33. Other dry fruits	..	3	..	..
Total fruits	..	8,794	..	..
34. Jute	..	61	389(Bales)*	6.54(Bales)
35. Cotton	..	2	4(Bales)	2.00(Bales)
36. Mesta	..	3,086	13,021(Bales)	4.22(Bales)
Total Fibres	..	3,149	13,424(Bales)	4.26(Bales)
37. Chillies	..	1,351	343	2.54
38. Turmeric	..	173	1,276	73.78
39. Coriander	..	411	187	4.85
40. Garlic	..	364	1,435	39.42
Total spices of condiments	..	2,299	3,241	14.10
41. Tobacco	..	478	167	3.49
42. Sugarcane	..	2,780	17,628	63.41

* 1 Bale=180 Kgs.

Source—Directorate of Agriculture, Orissa

APPENDIX III *

Distribution of improved seeds in the district (in quintals)

Name of Seed	1967-68	1968-69 '	1969-70
1	2	3	4
1. Paddyj ..	4,548.64	2,735.13	754.75
2. Maize ..	26.60	38.39	22.70
3. Biri ..	10.00	22.20	5.00
4. Mung ..	20.70	11.62	21.00
5. Wheat ..	96.20	82.35	70.35
6. Castor ..	2.25	1.73	2.50
7. Ground-nut ..	84.82	80.00	44.31
8. Mustard ..	9.39	0.28	2.71
9. Til ..	8.10	4.35	1.00
10. Jowar ..	0.75	2.34	..
11. Dhanicha ..	4.27	15.00	0.60

* Source—District Agricultural Officers, Angul and Dhenkar al.

APPENDIX IV *

Distribution of Fertilisers in the District (in quintals)

Type of Fertiliser	1967-68	1968-69	1969-70
1. Nitrogenous	.. 9,914.06	9,821.67	13,756.09
2. Phosphatic	.. 1,951.34	2,346.78	5,908.34
3. Potassic	.. 1,177.00	1,246.40	1,640.47
Total	.. 13,042.40	13,414.85	21,304.90

*Source—District Agricultural Officers, Angul and Dhenkanal

APPENDIX V *

Live-stock Census (1961)

1. Cattle	..	641,067
2. Buffaloes	..	105,776
3. Sheep	..	59,576
4. Goats	..	161,746
5. Horses and Ponies	..	4,792
6. Mules	..	2
7. Donkies	..	4
8. Pigs	..	741
9. Poultry	..	168,960
<hr/>		
Total Live-stock	..	973,707

* *Source*—1. Dhenkanal District Census Handbook (1961) —P. 340

2. Statistical Abstract of Orissa, 1963 —PP. 677—682

APPENDIX VI
Animal Diseases (1969-70)

Sl. No.	Name of the disease	No. of outbreak	No. of attack	No. of death
1	2	3	4	5
1	Haemorrhagic Septicaemia ..	28	216	125
2	Black quarter ..	3	7	5
3	Foot and Mouth disease ..	12	586	Nil
4	Rinderpest ..	5	57	43
5	Ranikhet disease ..	2	500	70
6	Anthrax ..	1	10	5

APPENDIX VII

List of Veterinary Hospitals, Dispensaries, and Stockman Centres

HOSPITALS

- | | |
|--------------|---------------|
| 1. Angul | 4. Pal Lahara |
| 2. Dhenkanal | 5. Talcher |
| 3. Hindol | |

DISPENSARIES

- | | |
|----------------|---------------------|
| 1. Athmallik | 10. Kamakhyanagar |
| 2. Banarpal | 11. Kaniha |
| 3. Bantala | 12. Kankadahad |
| 4. Bhuban | 13. Khajurikata |
| 5. Chhendipada | 14. Odapada |
| 6. Gondia | 15. Parjang |
| 7. Handapa | 16. Rajkishorenagar |
| 8. Jarpara | 17. Rasol |
| 9. Kaimati | |

STOCKMAN CENTRES

- | | |
|-------------------|-------------------|
| 1. Aida | 28. Khamara |
| 2. Anlaberini | 29. Khandabandh |
| 3. Angapara | 30. Khinda |
| 4. Badkera | 31. Kiakata |
| 5. Bagdia | 32. Kishoreganj |
| 6. Bainsia | 33. Madhapur |
| 7. Bajrakot | 34. Mahabirod |
| 8. Balipata | 35. Mahulpal |
| 9. Bamur | 36. Manikamara |
| 10. Banasingu | 37. Mathakargola |
| 11. Batisuan | 38. Moratira |
| 12. Bhagirathipur | 39. Muktapasi |
| 13. Bimalbeda | 40. Nuagaon |
| 14. Birasal | 41. Pabitrnagar |
| 15. Biribolei | 42. Paikpurunakot |
| 16. Chasagurujang | 43. Paiksahi |
| 17. Gulehi | 44. Patala |
| 18. Guneibil | 45. Patrapara |
| 19. Ichhatipur | 46. Purunakot |
| 20. Inkarbandh | 47. Raniakata |
| 21. Jarada | 48. Samal |
| 22. Jharbeda | 49. Siarimalia |
| 23. Jiral | 50. Tainsi |
| 24. Joranda | 51. Talmul |
| 25. Kampasala | 52. Tangiri |
| 26. Kandhal | 53. Thakurgarh |
| 27. Karadabani | 54. Titirima |

(CENTRES DOING ARTIFICIAL INSEMINATION WORK)

- | | |
|------------------|---------------|
| 55. Baladiabandh | 58. Ghatipiri |
| 56. Bhapur | 59. Motanga |
| 57. Gadasila | |

(KEY VILLAGE STOCKMAN CENTRES DOING NATURAL BREEDING)

- | | |
|-------------|------------|
| 60. Deogaon | 61. Mandar |
|-------------|------------|

(KEY VILLAGE STOCKMAN CENTRES DOING ARTIFICIAL INSEMINATION)

(A) Angul Key Village Block

- | | |
|-------------------|-----------------|
| 62. Balaramprasad | 67. Mumursingha |
| 63. Jarasingha | 68. Natala |
| 64. Kangula | 69. Nisa |
| 65. Kardol | 70. Purunagarh |
| 66. Kosala | 71. Sankerjang |

(B) Talcher Key Village Block

- | | |
|-----------------|---------------------|
| 72. Badajorada | 77. Gurujanguli |
| 73. Danara | 78. Gotamara |
| 74. Dharampur | 79. Kalamchhuin |
| 75. Ghantapada | 80. Naraharipur |
| 76. Gopalprasad | 81. Radhakrishnapur |

Source — District Veterinary Officer, Dhenkanal