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# Settlement Reports 1872 – 1900 (I)

*Russell's Sambalpur Settlement Report, 1872 · Maddox's Final Report on the Survey and Settlement of Orissa, 1890–1900, Vol. I*

11

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(b) Taldanda system. Below this the right bank of the Mahanadi and Sukpaika rivers is continuously embanked ( Nos. 47 to 55 and Nos. 69 to 86 ) to Jaipur, and from there to Taldanda the country is protected by the canal. Between this line of embankment and the Machgaon Canal there lies about 200 square miles of country protected from flood and generally within reach of irrigation.

The embankments have been completely remodelled in recent years, but in 1870 Mr. Taylor reported that the embankments below Jaipur are very ancient, and that the old Raj *bund* was far superior to the Government embankment. It is interesting to notice his conclusion that in former years the floods in the Mahanadi ranged higher than those of which we have any record. This fact may be set off against the increasing currents of the Katjuri floods.

Mahanadi Left system (c) Kendrapara The left bank of the Mahanadi from Cuttack to Marsaghai follows the Kendrapara canal to the north of which the country is protected from all floods. Between the Kendrapara and Taldanda canals is a long strip of country more or less exposed to the floods of the Mahanadi and its branches and including parganas Paenda, Suhang, Kusmandal, Suknai, Balubisi, Abartak, Anabartak and Paena.

(d) Sukpaika The Sukpaika leaves the Mahanadi at Aitpur, pargana, Kodinda, rejoining it at Arang in pargana Balubisi 18 miles lower down. In the island thus enclosed lie portions of parganas Paenda and Balubisi. They suffer a good deal from floods, though partly protected by embankments. Mr. Taylor recommended the closing of this channel, but I would rather recommend the strengthening of the embankments at the western end of the island, Nos. 56, 72, and 73.

(e) Chitratola and Nuna. The western end of the traingle lying between the Mahanadi and Chitratola and containing portions of parganas Paenda and Suhang suffers a great deal from the frequent loss of crops; it is almost unportected, but I do not think that much can be done to better it. Lower down, the country between the Nuna and Chitratola rivers containing portions of the parganas Suhang, Kusmandal, Suknai, Balubisi, and Paena, is one of the richest and most highly assessed in the District. It is protected by second class embankments numbered 43 to 45 and 46 to 61, and by a third class embankment Nos. 62 and 63 and some fourth and fifth class embankments, so that the water only overflows in high floods. It suffered very badly in 1896, but the embankment at the upper end of the island is now in good repair and is not likely to be breached. The lower eastern end of the island, containing portions of parganas Suknai, Balubisi and Paena, is open to the floods of the Nuna, which have been aggravated by the construction of the Kendrapara canal.

This part of the country grows comparatively little paddy, the people depending almost entirely on the *rabi* crops ***Kulthi, birhi,*** caster ***arhar*** etc.

I believe that some of flood channels in this part might be canalised and would be of great value for winter irrigation.

(F) The Sukpaika Between the Chitratola and the Sukpaika is a strip of land containing the greater part of pargana Balubisi and portions of Paena and Abartak. It is protected from floods by second class embankments bearing Nos. 7 to 14 and 17 to 28, but they are not continuous, and in the flood time the rivers overflow their high banks with, on the whole, a most beneficial effect. Splendid crops are reaped in these parts and rent are almost the highest in the Province.

The island between the Paika and Mahanadi containing lands of Balubisi, Barpala, and Abartak is similar to the last, being partially protected by embankments of the second class Nos 1, 2 and 3 and by the fourth class embankments Nos. 25 to 46. I cannot estimate the effect of abandoning the latter, but the country is now so prosperous that I would not advocate any change.

The Kendrapara-Patamundai Canal system. North again from this area the whole tract between the Kendrapara and Patamundai canal, containing the greater part of parganas Saraswati, Karimal, Padampur, Sungra, Matkatnagar, Asureswar, Derabisi, Nahakhand. Tikan, Chhedra, and Utikan is protected from floods by canal embankments.

The total area so protected is about 300 square miles ; it is drained by the old Gobri river and by artificial channels. The drainage is not considered by

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the people satisfactory, and I have heared many complaints, especially against the Patuali in Matkatnagar which is said to need sluices to prevent the water escaping too freely.

In a few villages the floods of the Gobri still do a little harm, but not much.

**Embankment of the Birupa and its branches.**

25. The next tract we come to is the basin of the Birupa. The right bank of this river is continuously embanked from its source branches to Patamundai, 50 miles below. On the left, again, hills and first class embanknents. (Nos. 110 to 113) line the channel as far as pargana Kerualkhand, and from there protect the left bank of the Ganguti down to pargana Dihi Arakhpur, cutting off at its source the Chota Ganguti. In between the right and left embankments lie parganas Kuhunda Jaipur, Dihi-Arakhpur and Western Alti. All over these the water flows deeply in floods of any extent and its escape being checked by the hills of Manduka and Osia, lies long enough to drown all the crops. Kuhunda Jaipur suffers most, more indeed than almost any pargana in the District. There are but a few remains of Old *bunds* in this area, and I understand that it is out of the question to construct more.

Speaking with all deference as a layman I do not quite see why something should not be done; for Mr. Taylor, in his report on the Orissa Embankments in 1872 proposed to cut off the Ganguti at its head, and thus force the whole stream down the channel of the Birupa and through the narrow gorge between the Manduka hill and the right embankment. It is also apparent that the damage done is not due to the insufficiency of the channels so much as to the banking up of the waters on meeting the flood of the Brahmini and the hills of Alti. As all the stream has eventually to pass through the channels left by the hills I do not see why the traingular block formed by Kuhunda Jaipur, with its apex at Nandakisharpur and its base in the Manduka and Osia hills, should not be completely protected. Financially, I presume, it would not pay, but it would be a boon to the people.

**High Level Canal irrigated area,**

Between the left bank of the Birupa and the high lands on the west of the District the country is irrigated from the High Level Canal, and area is protected from all serious floods.

**Embankments of the Brahmini and its branches.**

26. From Indalva in Killa Balarampur where the Brahmini enters the plains to Kotpur in pargana Atli, the right bank of the Brahmin and its branch the Kimiria is lined by the High Level Canal and the first class, embankments numbered 107, 109, and 116. The low lands of Killas Balarampur and Madhupur and the north-western corner of Alti are thereby protected, and are to some extent irrigated from the High Level Canal.

Below this there are no embankments on the right of the Kimiria, and its waters joining those of the Ganguti and banked up against the hills inundate the central portion of Alti pargana. Loss of crops is frequent, the water sometimes standing for days at a depth of several feet but I have seen only a few traces of sand deposits in this area, and the silt enables fair *rabi* crops to be grown.

Between the Brahmini and the Kimiria lie portions of parganas Alti, Bargaon, and Beruan. In this area are some Government embankments of the third and fourth class bearing Nos. 247 to 261. They are not continuous, but with the aid of a few zamindari lands, protect the villages of Alti and Beruan from serious damage. In Bargaon loss of crops is more common, but good *rabi* is obtained.

It has been estimated that the loss of revenue consequent on the abandonment of these embakments would be Rs. 1,000/-.

**Utikan embankments.**

To the east of pargana Bargaon the Brahmini flowing down the Sankara channel joins the Kelua, as the united Birupa and Kimiria are called, and under name of the Brahmini falls into the Dhamra below Chandbali. As far as Alba the Patamundai canal protects all the country on the right bank, and cuts off at its head the Chhota Brahmini channel. In the island enclosed by the Brahmini and Chhota Brahmini rivers lies the pargana of Utikan formerly surrounded by protective embankments, but the supply of water in the Chhota Brahmini has been so much diminished that those on the south said have been abandoned and only the second class embankment No. 100 along the Bara Brahmini is to be maintained. The water, however, backs up in the Chhota Brahmini and being salt, the result of even a small overflow is injurious. The only remedy that I see is by a system of sluices

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on the Chhota Brahmini to inundate the country with fresh water in flood time. This would be beneficial to the riparian lands in both Tikan and Utikan.

**Brahmini Left.**

This disposes of the right bank of the Brahmini so for as it concerns the areas under settlement, and we must now return to Janapur where the Kharsua and Patia branch off to the left. The head of the former has been dammed by the embankment connecting to Brahmini-Patia anicuts, and it now forms a spill channel for the waters of the Janardhan and other ***ghais*** down to its junction with the Patia where the combined stream takes the name of Kharsua.

Between the Brahmini and the Patia lies one of the most heavily inundated tracts in the district, comprising parganas Olas, Beruan, Kalamatia and Hatimunda. For some distance below the Janapur anicut the left bank of the Brahmini is unembanked; for the most part it is high and sandy, but there are some bad breaches in it, through which the flood-water spills over the country. The most notorious of these is the Janardhan ghai which, starting a few miles below the anicut, flows through Olas and eventually falls into the Dudhai, a branch of the Kharsua in pargana Beruan.

This is an old channel, and I understand that it is out of the question to close its in takes, but there can be doubt but that it has done great harm and will continue to do so in years of exceptional floods. The attempt of the Madhupur estate to protect some of their villages by a circular embankment at Gopalpatna proved disastrous, for when the ***bund*** gave way in 1896 the whole country suffered to an exceptional degree by the sudden rush of water.

A little above Dharmasala, the country is protected by embankments of classes I, II, and IV, Nos. 240 and 241, extending for a distance of about 5 miles. I am not sure that these embankments are of much value, as the country they project is annually inundated by water from the ***ghais*** higher up. Below this, the left bank of the Brahmini is open, except for a couple for miles in the west of Kalamatia, where the Dudhai ***nala*** is embanked by the third class embankments Nos. 242 to 244, and again between Kalamatia and Andara villages, where the country is protected by embankments, Nos. 245. and 246. In floods of any height the river overflows its banks, but I have not found that much harm is thereby caused, and I would not recommend the construction of any more embankments. The existing embankments I consider to be useful in so far as they prevent the formation of ***ghais,*** which always do a lot of harm.

**Patia Right.**

Except for the short canal embankment closing the head of the Kharsua, the Patia river is practically open for the whole of its length, and I have not the knowledge on which to form an opinion as to the utility of the few fourth class embankments on its right. Generally it may be said that the most singular characteristic of this river is the great number of spill channels formed by it, of which I may enumerate the Dudhai nala, the Similia ***ghai,*** the Santi ***ghai,*** the Raipur ***ghai,*** the Kani nadi.

These ***ghais*** when first formed are every destructive, running in shallow channels, scouring out the fields and depositing sand. Later on, they usually cut channels deep enough to carry off the water and only do serious damage in exceptional years. When they reach this stage they should be provided with sluices and canalised, as is being done with the Dudhai; but breaches newly formed should, I think, be at once closed.

Of the several parganas between the Brahmini and the Patia, it is Olas and Upper Beruan, where the ***ghais*** take their start, which suffer most from floods and sand deposits. Lower down the water gets more spread out, and the ***rabi*** and ***dalua*** crops go far to compensate the raiyats for the occasional loss of ***sarad*** rice

**Patia Left.**

Above Jakadia the Brahmini and Patia spill over their banks into a saucer like plain known as the Sukinda Pat. The inundation is beneficial and the flood-water is kept in by an embankment maintained, I believe, by the estate.

Below Jakadia the Shergarha villages are high and the river basin is bounded on the north west by the High Level Canal. For the protection of pargana Jodh between the High Level Canal and the Kharsua, a few second class embankments, Nos. 173 to 175, have been constructed, but they do not serve for much more than to preserve the village sites. The pargana suffers much from

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erosion of the soil and frequent loss of crops, but as the people are unwilling to accept the offers of the Public Works Department to canalise the Baidi Nala Sahi and supply water for *dalua*, they are probably not so badly off as they allege, and rents are highest in the flooded portions of the pargana.

**Bara Kharsua Left**

Further down, parganas Tisania and Dolgram are protected by the Bara Kharsua left embankment, class 1, No. 178, and there can be no doubt that the country to the north has greatly benefited by its construction; but, on the other hand, the people allege, and the local officers support their contention that this embankment has aggravated the floods in Southern Tisania, in Beruan, and Kalamatia, and is the cause of the breaches that have done so much harm.

Below Binjharpur again there are second class embankments, Nos. 186, 187, 169, 191, 192, 195, 211, 213, 214, 215. These have been breached in many places, but with the exception of the Bachol *ghai*, none of the breaches are alleged to cause more harm than good. In Dolgram the riparian villages are high, and the low lands grow *dalua*; in Bara the soil is saliferous, and requires to be thoroughly washed out by the freshets, and the opinion of the officers on the spot was that the breaches should be left open or the embankments abandoned below Singhpur, if not below Binjharpur. The question of the maintenance of that lower portion of the Kharsua left embankment is a difficult one. The floods undoubtedly do much harm to the low lands in Ahyas, Bautara, and North Dolgram, especially since the water-way has been closed by the Baitarni embankments, but, on the other hand, many villages benefit largely by the silt deposits, and there is some fear of the country suffering if the salt is not annually washed out.

**Embankments of the Baitarni and its branches.**

27. The right bank of the Baitarni is embanked above Roria to a distance of 7 miles, and above this the country in pargana Shergarha is so high as to be but little liable to inundation.

At ***Roria*** the Baitarni bifurcates, the sourthern branch, the Bura, joining the Kharsua in pargana Beruan, while the main stream joins the boundary of the Cuttack and Balasore districts.

**Bura River.**

On the right the Bura floods pargana Jodh, doing some harm; but I understand that this is inevitable, and rents do not appear to have been much lowered in consequene.

**Bura left.**

On the left Bura is embanked continuously with the Kharsua as part of the Jajpur Canal irrigation scheme. The embankment has proved of great benefit to the country protected, but it is said, and I think with justice, to have aggravated the floods on the right bank. The balance of profit and loss it would be difficult to strike, but the general opinion of the Assistant Settlement Officers is that the country as a whole has benefited.

**Baitarni Right.**

Since 1893 the Baitarni has been continuously embanked on the right down to pargana Ahyas, and the whole tract between the Bura, Kharsua, and this embarkment, embracing most of parganas Jajpur, Dolgram, and Tisania, part of Ahyas, protected from flood. Formerly the embankments were low and frequently breached; now they are above high flood level and secure. Below Ahyas the banks are high and partly embanked, but in high floods the river overflows them and this part of the country is also inundated through the breaches in the Kharsua embankment.

I am not here concerned with the effect of this embankment on the floods in Balasore, but in Cuttack also the people complain :

(1) That the embankment has cut off at their head the Benga and other streams which used to supply water for irrigation.

(2) That it prevents the escape of the accumulated rain water and of the water from the Kharsua.

As to the former of these objections much of the land may now be irrigated from canals, and I understand that the Public Works Department are canalising the closed canals so that they may be used for *dalua* and *rabi* irrigation. As to the second objection, it has not been shown that the drainage is seriously obstructed, and the local officers report that it is only



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in the very low lands that the water lies deep. Mr. Carey writes: "I think there can be no question that benefits of the protection far outweigh its disadvantages, but I would strongly suggest that the attention of the Irrigation Department should be drawn to the value of canalising streams that have been cut off."

Irrigation.

28. Having now given a short account of the extent to which the principal rivers in the temporarily-settled area are embanked, I propose to pass on to the question of irrigation. In the figures quoted I include those of the High Level Canal, Range III, in Balasore.

History of Irrigation.

While the embankments have existed from the earliest times, canals are of but recent construction in Orissa, and owe their origin to the private enterprise of the East India Irrigation Company. This company started with a most ambitious scheme for a system of canals for navigation and irrigation extending from Calcutta to Puri.

The works were begun in the early sixties and were but partly completed in 1867-68, when the Company being unable to carry it on any longer, Government took over from them at a valuation, and completed the scheme with very great modifications.

The works sanctioned included the Taldanda and Machgaon Canals for the irrigation of the lands between the Mahanadi and Katjuri rivers; the Kendrapara and Patamundai Canals for the irrigation of the area between the Chitratola and the Birupa, and three ranges of the High Level Canal for the irrigation of the strip of country lying at the foot of the hills from Cuttack to Bhadrak.

By 1874 the greater part of this modified scheme was complet, but the collections prove very disappointing, and in 1884 a revised scheme was approved for the extension of the Taldanda and Machgaon Canals and the constructions of new distributaries, bringing the total estimate up to Rs. 3,23,00,000, of which Rs. 2,02,00,000 had already been expended.

The scheme then approved has been completed with the addition of 5 miles of the Machgaon Extension Canal beyond the village of Nagpur; and one additional canal with a total length of 7 miles, from Jajpur to the junction of the Baitarni and Bura was completed in 1895. The total expenditure up to the end of the year 1897-98 was Rs. 2,63,02,141 and to show for this there are seven weirs across river channels with an aggregate length of 3½ miles, which constitute, with canal head sluices and entrance locks, the most extensive head works of any canal system in India. There are 205 miles of canal available both for irrigation and navigation, and 75 miles of canal for irrigation only, besides nearly 1,100 miles of distributaries and village channels. The maximum discharge of the canals in 1895-96 was 6,058 cubic feet per second and the area commanded was 5,71,000 acres; the area now shown as actually irrigable is about 4,01,000 acres, and the area leased for irrigation is 2,00,000 acres.

Machgaon Canal.

29. Beginning from the south of the district, we meet first with the Machgaon Canal which, leaving the Taldanda Canal at Fakirpara, 7 miles south of Cuttack, runs along the north bank of the Katjuri river and of its branch the Alanka, for a distance of 32 miles. It stops short by 6 miles of Machgaon, the terminal station at first proposed, and there is not much probability of its further extention unless circumstances should render it desirable to make a new route from Cuttack to the sea *via* to Devi river. To do this it would be necessary to deepen the canal and provide it with locks, as it is not now navigable; and I apprehend that a branch railway line to Machgaon would be more likely to pay its way.

The canal has a discharge of 776 cubit feet* per second and commands about 97,000 acres, for 82,000 of which distributaries had been completed in 1897. It irrigates the portions of parganas Kodinda, Hariharpur and Karania south of the Hansua drainage channel; and distributaries have been recently made to command the portion of pargana Kate east of the Deb river and part of pargana Benahar. In the latter there is room for a great extension of canal irrigation, but Kate is already well supplied with creeks and tanks, and it is not certain that canal water will be wanted.

* Figures in this and the following paragrphs are taken from the Irrigation Manual of 1897.

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**Taldanda Canal.**

30. The Talanda canal takes off from the right bank of the Mahanadi at Jobra, immediately above the anicut and runs in a south-easterly direction to Fakirpara where it gives off the Machgaon branch. Thence it skirts the southern bank of the Sukhpaika river to Jaipur and from Jaipur to Taladanda it follows to course of the Mahanadi river, forming also a protective embankment. It has a total length of 52 miles, is navigable by both of a considerable size and provides an alternative route from Cuttack to Chandbali *via* the Hansua creek.

It has a discharge of 1,342 cubic feet per second, of which about half is taken off by the Machgaon canal, and commands 75,000 acres lying in the north of parganas Kodinda, Hariharpur, Jhankar, Tiran and Kandhi. The first three have always been more or less protected and were at the last Settlement fertile and highly assessed, but last two were formerly very backward, being liable to inundation and inaccessible, and they have been most markedly improved.

**Kendrapara Canal.**

31. The oldest and most important of the Orissa canals is the Kendrapara Canal which, taking off from the Birupa river at Jagatpur just above the anicut, skirts the northern bank of the Mahanadi and its tributary the Nuna river for a distance of 39 miles. It irrigates the country between the Mahanadi and the Gobri drainage channel, its right bank forming at once to protective embankment and a thorough-fare for the people. The country it commands comprises some of the most highly assessed parganas of the district, such as Sungra, Matkatnagar and Derabisi and the water is now, owing to the system of drainage, absolutely indispensable.

The discharge is 1,067 cubic feet per second. The area commanded is 1,08,000 acres and the 23 distributaries are capable of supplying water to 97,000 acres. Nearly all lands requiring irrigation from this canal are already under lease. It is provided throughout with locks, and is navigable to Marsaghai.

**Gobri Canal.**

32. The Gobri Canal is a branch of the Kendrapara Canal. Taking off from the 32nd mile it runs 15 miles in an easterly direction to the Gundakia river. It is navigable and forms part of the main route from Cuttack to Chandbali. The area irrigated lies chiefly in parganas Tikan, Derabisi, and Chedra, a part of the country requiring much systematic drainage before the canal water can be extensively used. Its discharge is 373 cubic feet per second and the area commanded is 21,000 acres; but the distributaries completed can only irrigate 9,200 acres.

**Gobri Extension.**

33. This canal is only 6 miles long and forms the connecting link between the terminus of the Gobri Canal on the Gandakia river and the Bramhmani at Albha. It derives its water supply partly from the Patamundai Canal and partly from rivers, and irrigates the pargana of Utikan.

The discharge is 648 cubic feet per second and the area commanded 32,000 acres; but distributaries have been constructed for only 7,600 acres, and this canal is more used for navigation than for irrigation.

**Patamundai Canal.**

34. This canal leaves the Kendrapara Canal just below the head works at Jagatpur and skirts the southern bank of the Birupa river down to Indipur, where it begins to turn southward, and falls into the Gobri Extension near Albha after a circuitous course of 47 miles.

It is provided only with weirs and is not therefore available for navigation, but it irrigates some of the richest rice-lands of the province in Sungra, Matkatnagar, and Chaudakulat, and its left bank protects a large tract from the floods of the Birupa and Brahmini rivers. In the lower reaches some of the lands are too low to need artificial irrigation, but higher up the country is well drained and most villages are under lease.

The discharge is 885 cubic feet per second and the area commanded is 51,000 acres; the distributaries are capable of irrigating nearly 44,000 acres.

35. This canal forms part of the original scheme for connecting Puri with Calcutta by canal.

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**High Level Canal.**

There ranges only have been completed. Range I, from the Birupa to the Brahmani river, a distances of 33 miles; Range II, from the Brahmani to the Baitarni river, a distance of 12½ miles; and Range III, from the Baitarni to Bhadrak in the Balasore district, a distance of 39 miles.

It is the most picturesque of all the canals of Orissa, skirting the very base of the wooded hills of Darpan and Balarampur. The traveller, by the launches that ply on it, looks eastwards over almost boundless rice plains whose level surface is broken only by a few hills that here and there rise steeply from the sorrounding country, while to the west his eyes see nothing but range upon range of rugged hill and valley in endless confusion. As an irrigation canal it is not a success and the newly, constructed railway will detract much from its value as a navigation route.

The first range commands 49,000 acres, the whole being irrigable by the existing channels. Only a portion of this is, however, under lease, and in some parts the natural irrigation from hill streams is difficult to replace. The second range commands about 10,000 acres, but only a very small area is irrigated and its most likely use is for *dalua* irrigation through spill channels.

By the Balasore Range 57, 500 acres are said to be commanded but the distributaries are only capable of irrigating 44,000 acres.

**Jajpur Canal.**

36. The Jajpur Canal, the youngest member of the Orissa System, starting from the fork of the Baitarni and Bura rivers, runs 6½ miles in an easterly direction to Jajpur town, up to which it is navigable. It has a discharge of 700 cubic feet per second, and commands 70,000 acres. The area for which water could actually be given in 1896-97 was 37,000 acres.

The canal secures from drought the valuable lands between the Baitarni and Kharsua rivers, and has been a great boon to the low-lying villages, growing spring rice, which formerly were irrigated with brackish water from the creeks.

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## CHAPTER III

### PHYSICAL AND STATISTICAL ACCOUNT OF BALASORE

(This chapter is taken *varbatim* from Mr. Kingsford's report on Balasore.)

**Boundaries and Area.**

37. Sir William Hunter, in the statistical account contained in the second volume of his History of Orissa, has given so complete a description of the district that very little need here be said regarding its physical aspects. I shall therefore pass rapidly over those physical conditions in which the lapse of thirty years has brought about little change, and deal more fully with such subjects as canals, population, villages, markets and ports, upon which supplementary information is now available.

The district consists of an alluvial tract lying along the coast of the Bay of Bengal, about 90 miles in length, and varying in width from 30 miles at the north-eastern extremity to 10 at the narrowest, or central, portion and 40 in the south. The district of Midnapore bounds the north-east, the wooded hills of the Tributary States of Mohurbhanj, Nilgiri and Keonjhar lie along the northern, and western flank, and in the south the river Baitarni marks the boundary of Cuttack.

**Area.**

The following statement will show particulars of the area under settlement of rents:—

| | Acres. |
|---|---|
| Area of *Lakhiraj bahal* lands .... .... | 1,09,000 |
| Area of temporarily-settled estates .... .... | 9,59,100 |
| Area of Government lands .... .... .... | 13,600 |
| Total .... .... | 10,81,700 |
| *Deduct*—lands of Balasore estates in Cuttack district .... | 7,700 |
| Balance .... | 10,74,000 |
| *Add*—lands of Cuttack estates in Balasore district. .... | 20,900 |
| Total area under settlement of rents in this district or 1,710 ¾ square miles .... | 10,94,900 |

The total area compiled by villages amounts, however, to 10,95,800 acres, and the difference of 900 acres is due to the inclusion of a permanently-settled village in Nangleswar pargana.

Adding to the area above shown *viz.*, 10,95,800 the area of permanently-settled estates, 1,21,400; and of the Wards' Estates of Kanika within this district, 1,11,900, we have a total area of 13,29,100 acres or 2,076 ¾ square miles (See also paragraphs 503 and 504).

Cuttack estates, to the number of 295, have an area of 20,900 acres, situated in this district, while 7,700 acres, belonging to Balasore estates, are situated in Cuttack.

The area of Government lands includes 3,424 acres recorded as under the Collectorate. These are beds of certain navigable rivers and other miscellaneous items. Under the Public Works Department are 6,349 acres, including canals, embankments, roads, and bungalows. The District Board holds 2,400 and Local Boards 498, acres. The area of the Bengal-Nagpur Railway north of the river Burabalong is 570 acres. South of the Burabalong, with the exception of some lands in thana Soro, mutation was not made in favour of the railway, as the lands were not acquired till after final publication of the records. Smaller areas are held by the Municipality, Police, and other Departments.

**Northern rivers.**

38. I shall here note only the principal rivers of the district.

Proceeding from north to south, the first is the Subarnarekha, which rises in Chota Nagpur and pursues a winding course of some 60 miles in this district. It communicates with the Coast Canal at Jamkunda Lock and is largely used by country boats from Calcutta. This river carried the earliest European trade in India to and from the ancient port of Pipli, originally occupied by the Portuguese and subsequently (in 1635) by the English and abandoned in the early



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part of the next century owing to the silting up of the river. It is tidal up to a point above the ferry of Kalikorpur, 15 miles from the mouth, and 25 miles further up its course is spanned by the railway bridge at Rajghat near the ferry on the Grand Trunk Road. The floods, which are frequent, penetrate to a greatest ditance of 12 miles and to an average distance of 4 miles from either bank, and those most destructive during the latter half of the century occurred in the years, 1868, 1883, 1888 and 1896.

The next river is the Haskura, a hill stream which rises in Mohurbhunj and, flowing across the Irish Bridge on the Grand Trunk Road, below Rajghat, passes south over the Basta-Baliapal Road to Tapabulang, where it communicates, through an inlet, with the Coast Canal.

This stream contains very little water during the hot season, but has been known to cause considerable damage in the rains, when it carries away a great portion of the Subarnarekha flood.

The river Sartha runs a parallel course a few miles to the south and, passing under the bridge on the Grand Trunk Road at Basta, runs into the sea at the mouth of the Panchpara. It is tidal upto the Coast Canal.

The Panchpara is formed by the confluence of several hill streams from Mohurbhunj, one of which is tidal so far as spot to the north of Haldipada on the Grand Trunk Road, to which country boats can penetrate during the rains.

The Burabalong, on which Balasore town is situated, at a distance from the mouth of 7 miles as the crow flies, but 15 by river, runs a course of 35 miles through the district. The name signifies "the old twister", and bears reference to the winding nature of the course.

The river has silted considerably, a process which had commenced before last century, and there is a difficult bar at the mouth. The India General Steam Navigation Company, however, runs a weekly service of steamers between Calcutta and Balasore. The area commanded by the floods of the Burabalong is not extensive, and lies to the north and north-west of the town.

Southern rivers.

39. Passing over the Pa'ga' and Nembu rivers, the next of consequence is the Ka'nsba'ns, which is formed by the confluence of a number of small hill streams.

Rising in the Tributary States from Ambohata, north-east wards from a length of 20 miles, these drain a large area of country, and after heavy rainfall in the hills, rush down with great violence and in considerable volume. These sudden floods sometimes cover a considerable area, but seldom do much damage as the water quickly subsides.

The Ka'nsba'ns itself passes under the triple bridge in the Grand Trunk Road, below Soro, and is then joined by two confluents, eventually reaching the sea by two mouths, the lower of which is called the Gamai. Owing partially to the construction of the Coast Canal, the latter has rapidly silted up, and the passage to the sea is now almost closed.

On the Gamai, 3 miles from its mouth, is situated the old port of Churamon, once an important centre of the export trade in rice and salt, but now an insignificant village.

A great volume of the flood water of the Gamai runs south-westwards along the old Churamon, or Ricketts' Canal, into the Matai, which drains the country east of Bhadrak and has a course of 40 miles. This river attains considerable volume at Charbatia, where it is joined by the Coast Canal; it runs thence into the Dhamra, by which communication is made with the port of Chandbali. The Matai is tidal as far as Ruknadeipur, 8 miles east of Bhadrak, to which point it is navigated by numerous country boats which carry traffic to and from Chandbali.

The river Salandi, rising, as the name implies, in the *sal* forests of the Mohurbhunj hills, flows across the south of the district past the town of Bhadrak and into the Baitarni, a few miles above Chandbali. In the rains it is navigable along its entire course of 50 miles through the district. It brings down a considerable flood, which seldom causes damage. The Rebo, and its tributary, the Kapali, run a parallel course to the south, and, with the Ganguti, discharges into the Baitarni. Neither the Salandi nor the rivers subsequently noted carry any water in the hot season above their tidal reaches about the village of Kaumpura,

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half-way between Bhadrak and Chandbali. Country boats ply between Kampura and Chandbali at every season of the year.

**The Baitarni.**

40. The last river to be mentioned is the Baitarni, which forms the southern boundary of the district. Though this carries very little water in the hot season, it passes an enormous volume in the rains. Down to Akhoyapada the left bank is protected by an embankment, but below this the whole country side is exposed, while the embankment on the right or Cuttack side prevents discharge of the water in that direction. The flood travels inland to a greatest distance of 8, and an average distance of 4 miles, and in the rains the country from Dhamnagar to Chandbali is one expanse of water. Owing to this and other causes, a great portion of the south of the district is subjected to almost annual flood, and the effects are much more disastrous than in the north, where serious floods are of less frequent occurrence. Both the Baitarni and Subarnarekha cause damage by deposit of sand, and the latter by erosion, since it frequently changes its course.

The Baitarni deposits very little silt and the Subarnarekha a great quantity. The Baitarni has few *pal* (silt-enriched) lands upon its banks while on the higher banks of the Subarnarekha there is a large area of such lands growing very valuable crops, though chiefly in permanently-settled tracts.

**Ferries.**

41. The ferries number eighteen, and they are under the control of the District Board, the leases being disposed of annually by auction.

The sale of the leases for the current year realised Rs. 6,458, and the value of those upon the Trunk Road at Phulwar and Rajghat, at the crossings of the Burabalong and Subarnarekha, respectively, was for a time some what depreciated owing to foot passengers making use of the neighbouring railway bridges. The practice was, however, discouraged by placing a chaukidar on guard; and since the line has opened for traffic, the use of the bridges for this purpose has been disallowed. The most important ferries are those first mentioned, the Rajghat lease realising Rs. 1,300 and the Phulwar, a few miles north of Balasore town, Rs. 1,190.

All the Grand Trunk Road traffic crosses at these ferries, and at the latter is the branching of the high road to Mohurbhunj.

The Subarnarekha at Rajghat is not fordable, and the fact that the Phulwar ferry, which is easily fordable for seven months in the year, realises almost as much is due to the greater traffic at the latter. Coolies, pack-bullocks, and an aboriginal type of Sonthali carts, with solid wheels, come down in great numbers from Mohurbhunj, bringing faggots, charcoal, *sal* timber and paddy for disposal in Balasore town. With the diminution of traffic upon the Trunk Road, following the opening of the railway, the receipts from Phulwar and Rajghat, as well as from the Salandi ferry at Bhadrak, which realised Rs. 380, will, to some extent, fall off. The latter plies only during the rains, the salandi bed being quite dry in the hot weather.

Other ferries of importance include that of South Baliapal over the Matai, which sold for Rs. 860, and that of Balighat over the Burabalong opposite Balasore town; the lease of the latter realised Rs. 722. At the former passes all the rice from the Ankura pargana and some of Killa Kanika on its way to Chandbali, and the passage being here fordable, at no time of the year the receipts are necessarily large. On the Subarnarekha, at the crossing of the Baliapal-Kamarda Road, is the ferry of Kalikapur, which is also unfordable, the river being tidal to beyond this point.

**The Grand Trunk Road.**

42. The Grand Trunk Road, which runs for a length of 95 miles from and to the end of the district, affords communication with Midnapore and Calcutta on the north, and with Cuttack, Puri and Ganjam on the south. It was built by Captain Sackville between 1812 and 1820, the portion in Balasore being opened in the latter year. Complaints regarding obstructions of drainage were common and were put forward by the zamindars, even as late as at last settlement. According to Mr. Toynbee, the raiyats in the neighbourhood of Bhadrak commonly indulged in the practice of cutting the road in order to allow escape to the water.*

* Toynbee's History of Orissa, Page No. 83.

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No doubt there was considerable lodgment of flood water near the rivers Kapali and Rebo, and especially at Bhadrak itself where an Irish bridge now admits free passage to the overflow of the Salandi. The waterway generally allowed is certainly sufficient, and at such spots as the triple bridge over the Kansbans would seem excessive to one who had not seen this river in flood. In the north of the district, a few miles south of Rajghat, the road was breached in June last year by the flood of the Subarnarekha discharging along the line of the river Haskura, and breaches have occured at the same spot on previous occasions. The waterway provided here must, therefore, have been insufficient, and damage has no doubt been caused on many occasions by lodgment of water. This has now been obviated by the construction of an Irish bridge.

The metalling of the road was not completed for forty years, and the soling appears to have been insufficient. Owing to this fact and the cutting down of the budget provision for maintenance of the road, it has rapidly fallen into disrepair, and between Balasore and Soro, where the traffic is heaviest, it is in places almost impassable for carts during the rains.

With the advent of the railway, which closely follows the course of the road, the latter will naturally fall into some disuse, and the policy of neglecting it may, therefore, be a wise one.

**The Trunk Road in early years.**

There existed originally along the side the road of a number of fine brick culverts, also apparently built by the Military Department, and leading over the roadside *nalas* to the neighbouring villages. These have all been allowed to fall into decay, scarcely any are now standing. The only route to Puri from Northern and North-Western India, this road, during the early and middle parts of the century, exhibited a constant stream of passenger traffic. Some of the pilgrims from the Central Provinces found there way down through the jungles of the Tributary States, as they had been accustomed to do before the road was built, but their number was comparatively by small. *Sarais* existed at Rajght, Basta, Balasore, Bhadrak, and Akhoyapada along the line of the Trunk Road.

They were built in 1827 at the expense of a wealthy Bengali Hindu, who also provided for many of the bridges which bear inscription recording his name and munificence *. It is curious that these are almost the only works of public benefit, the outcome of private charity, to be found in this district, and it is significant that they are due to the generosity of a foreigner. It is not always, perhaps, that such generosity takes so useful a shape, for the construction of these *Sarais* and bridges must have done much to alleviate the distress and misery of the wayfarers from Jagannath, when all the evils of the rainy season, swollen and impassable rivers, cholera and starvation, combined to render desperate the position of wretched pilgrims, their Constitution exhausted, enfeebled by long months of travel and by the rancid "Mahaprasad" of the Holy City. The *Sarais* have long since been abandoned, and all have disappeared. At Basta only is still to be seen a row of dilapidated buildings surrounding a square court-yard overgrown with jungle.

With the inauguration of the steamer services between Calcutta and Cuttack in the sixties, the Trunk Road lost its importance as a pilgrim route, and of late years only a small number have travelled by it. Now that the railway is open, scarcely any are to be seen except an occasional *fakir* measuring his length along the road upon his toilsome journey southwards.

**The Trunk Road at present.**

The chief traffic of the road lines between Soro and Balasore. The former place is the central market of the Banchas Oger parganas. Here the paddy is collected for transmission by cart to Balasore and hither come imports in the shape of oil and salt for distribution at the bazaar and in the neighbouring markets. Pack-bullocks and occasional carts on their way to Balasore from Ambohatta and neighbourhood join the road a mile south of Soro. Upon the road, as a whole, however, the local traffic is inconsiderable. Each branch road and country footway supplies a small quota of carts, or more usually of pack-bulocks, on their way to Balasore or Bhadrak.

In the north of the district are to be seen many Sonthali carts and coolies from the Tributary States to Balasore with loads of timber, faggots, paddy,

* Toynbee's History of Orissa, Page No. 83.

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charcoal, and bazaar commodities such as horn,* honey, fowls, and hides, and returning with oil, salt and cloths. But the more considerable body of traffic is to or from places at a distance. Thus from Bhadrak large herds of cattle start upon their way to the Calcutta market, and trains of carts carry hides to the same town as well as to Midnapore. From Midnapore the carts return to Bhadrak and Cuttack with mats manufactured in that neighbourhood.

**District Board Roads.**

43. Roads to the number of 38, with a total length of 309 miles, are maintained by the District Board.

With the exception of some 40 miles, these are unmetalled, and many of them are fair-weather roads impassable for cart traffic during the rains.

In the north of the district especially they are subject to damage by each high flood of the Subarnarekha, and in June of 1898 the Kamarda-Baliapal, Baliapal-Basta, Kamarda-Jaleswar and Singla-Nangleswar Roads, though constructed to allow great waterway, were breached in numerous places, many of the bridges being carried away and others so scoured out as to be render unsafe for traffic. The roads above mentioned are the most important in the north of the district, since they connect the local markets with the Trunk Road; they are chiefly used by pack-bullocks.

South of these may be mentioned the Panchpara-Haldipada Road; and, at Balasore, the road to Mitrapur in Nilgiri which passes through the important bazaar of Remna, the centre of a considerable trade in brass utensils. From this neighbourhood Balasore town draws its supply of vegetables. Further south there is a short branch road leading to Nilgiri, and at the 16th mile of the Trunk Road, below Balasore, branches the road to Talpada on the Coast Canal.

At Soro four roads converge. One from Gopinathpur on the borders of Nilgiri; another from Anantapur on the east; a third stretching to the south-west and passing through Ambohata to Bhadrak; and the fourth a short road running through Soro bazaar and joining the Trunk Road, 5 miles lower down.

From Jamjhari market, at the 29th mile below Balasore, branches the road to Basudebpur on the Coast Canal, meeting here the old salt road from Balasore now extended as far as Bhadrak.

It was by means of this road that Balasore used to derive its supply of the salt manufactured in the Arangs of the south-east. At a point midway between Jamjhari and Bhadrak a road runs westwards to Kopari market in Ambohata. At Bhadrak, in addition to those from Basudebpur and Ambohata two other roads converge, that from Keonjhur on the west and that from Chandbali on the east. A few miles south runs the road to Dhamnagar, and near the point where the Grand Trunk Road crosses the Canal a new road has just been constructed to Jajpur.

Perhaps the most important trade route is that between Bhadrak and Chandbali. The surplus produce of the south-east of the district finds its way to Bhadrak, whence most of it is sent for export to Chandbali, either *via* Ruknadeipur or the Basudebpur road, whence it is carried in boats down the Matai and up the Dhamra, or *via* Kanpura on the Chandbali road, whence it travels by the Salandi. The traffic is therefore, very heavy along these portions of Basudebpur and Chandbali road, and they should certainly be metalled, the former to Ruknadeipur and the latter to Tihiri *hat*, as they are extremely difficult for cart traffic after heavy rain.

The produce of the south-east goes direct to Chandbali along the country roads and tidal creeks, and the next collecting centre is Soro, whence, as already noted, the produce is carried to Balasore. In the north of the district there is no main centre, but produce gathers at the local markets and for export at the various parts subsequently noted.†

The necessity for the construction of feeder roads to the railway is now obvious, and two at least are already being built which will connect Khantapara and Markond stations with the Grand Trunk Road.

In addition to District Board roads there are 67 village roads, with a total length of 200 miles, under the Sadar and Bhadrak Local Boards. These are

* Horn of buffalo, bison and deer.

† Paragrph 68.



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nearly all fair-weather roads, occasionally banked but generally consisting of mere cart tracts across the fields.

**Bungalows.**

44. In 1830 the only public bungalows existing were those at Balasore and Baripada. The latter was a dak station and the half-way house for travellers between Cuttack and Balasore, being about 50 miles distant from each.

A portion of the Baripada bungalow survived until 1898, when it was condemned and destroyed, and another has now been erected in its place.

At the present day the district contains no less than 34 inspection bungalows, including the road and canal bungalows maintained by the Public Works Department and those under the District Board.

**Churamon Canal.**

45. The first canal built in the district was that known as the Churamon or Ricketts' Canal, though why it received the latter appellation, I do not know, for, according to Mr. Toynbee's history,* it was apparently finished in 1826, the year before Mr. Ricketts' came to the district.

The canal connected Churamon with the Matai river and was intended for the transport of salt from the Arangs in the south to the port of Churamon, whence it was shipped by sloops to Calcutta. The route lay through the *jheel* lands of pargana Ankura, which the canal served in some measure to drain. It was, however, never entirely completed and soon fell into disrepair.

**Coastal Canal.**

46. The Coast Canal, which connects the Hughli at Geankhali with the river Matai at Charbatia, has a length of 71 miles in this district, and runs along the sea face at a distance varying between 2 and 10 miles from the coast. It contains eight locks and it divided into four ranges, the first of which is fed from the Subarnarekha, the second from the Sartha, the third from the Panchpara, and the fourth or lowest from the Kansabans. The last three ranges have inlets and escapes to allow of the admission and exist of flood water, which thus passes across the canal to the sea.

The canal was partially opened on the 15th July, 1885 and entirely in September, 1887, the work having commenced in the year 1880. The cost was originally estimated at 36 lakhs, but this sum was considerably exceeded and by 1894 nearly 45 lakhs had been spent and minor works connected with the canals were still under construction.

**Revenue of the Coast Canal.**

47. Looking at the figures for the last three years, the cost of maintenance was—

In 1895-96, Rs. 70,000. In 1896-97— Rs. 88,000.

In 1897-98—Rs. 61,000.

Expensive protective works are now in hand near Nalkul Lock, and the cost of maintenance is likely to show a considerable increase this year. The total receipts or gross revenue amounted to Rs. 88,000 in 1895-96, giving a profit of Rs. 8,000; to Rs. 86,000 in 1896-97, showing a loss of Rs. 2,000; and to Rs. 85,000 in 1897-98, giving a profit of Rs. 24,000. The years 1895-96 and 1897-98 are, in fact, the only years which have ever shown a profit; in no other year did the gross revenue cover the working expenses. Up to close of 1898, the capital outlay reached a total of Rs. 45,17,000 exclusive of interest charges of which no account is kept, while the net revenue, obtained by deducting the working expenses from the gross receipts, showed a total deficit of Rs. 1,17,000, of the receipts of last year Rs. 66,000 were tolls paid almost entirely by country boats; Rs. 17,000 tollage of the steamer service of two companies; and Rs. 1,000 for hire of the Government steamer.

The number of passengers carried by the steamer service has decreased from 1,04,000 in 1893-94 to 41,000 in 1897-98 and the receipts in tollage from this source also show a steady decline. The reason given by one of the companies for the decrease in number of passengers who are mostly booked through between Calcutta and Cuttack, was that the sea service to Chandbali had been made more frequent and was also cheaper. With the opening of the railway in March of this year passengers ceased altogether to use this route to Cuttack and the service between Balasore and Chandbali has accordingly been stopped. The margin of profit of the companies has for some time scarely sufficed to provide for repairs and depreciation, and there is little doubt but that the service will soon be altogether

* Paragraph 84.

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closed. If this be the case, the receipts of the canal will so far decline as to render any margin of profit over expenditure or maintenance extremely problematical in future years. Regarded as a commercial enterprise it must, in fact, be pronounced a failure, and it is interesting to note in the early literature * dealing with the canal as projected, that almost the entire export and import trade of Orissa was expected to be carried upon it. The revenue anticipated was Rs. 2,60,000 whereas cost of maintenance and interest on capital were estimated at Rs. 2,11,000. It was supposed therefore that a profit would be yielded after payment of all charges whereas in fact so far from defraying interest on capital expenditure the canal has not even paid for working expenses.

I do not lose sight of the fact that its use as a famine protection scheme was one of the motives for its construction. This was strongly insisted on by the Government of Bengal †, but it was strongly urged the project would prove remunerative and the Lieutenant Governor was so satisfied on this point that he was "prepared to guarantee the interest on the outlay". The Commissioner of Orissa, Mr. John Beames, appears indeed to have been the only local official who entertained any doubts, through these were shared by the Government of India, which declined at first to sanction the scheme. In any case there is no longer any use for the canal as a famine protective work, and as it is likely to pay in future years even less towards the cost of maintenance than it does at present, the time appears to have come for considering whether it should not be abandoned.

**Physical effect of Coast Canal.**

48. The canal being fed by tidal waters, is of no use for purposes of irrigation, and was not constructed with that intention. It does not therefore benefit agriculture and indeed it is a common complaint of landlords and raiyats that its effect has been deleterious. It is difficult for one who is not a Civil Engineer to arrive at any conclusion upon this point, but I may at least state an opinion that the embankment of the Coast Cananl prevents free egress of the Subarnarekha flood and thus raises its depth on the west side from pargana Kamardachour as far south as Sartha, and that a similar effect is produced in pargana Ankura. On the other hand it might be suppossed that the canal bank would afford protection against cyclonic irruptions of the sea. But I find that this is not the case, for in 1887 the water passed over the embankment and approached to within two miles of Balasore town. If the zamindars are sincere in their objections on these points it is to be supposed that they would welcome the abandonment of the canal, which might then be cut at the points where it is alleged to cause damage.

**High Level Canal.**

49. This canal has a range of 19 miles in this district between Bhadrak and Akhoyapada, whence it runs to Cuttack. It is fed from the river Baitarani at Akhoyapada and it appears that at one time it was proposed to prolong the canal to Balasore, a project which had to be abandoned because it was found that there were no rivers of sufficient size to afford an adequate supply of water.

Range III, which is that contained in this district was constructed between 1871 and 1891 at a cost of Rs. 8,26,000 or Rs. 9,87,000 including the cost of distributaries.

The average annual cost of maintenance is under Rs. 5,000, and the gross receipts may be estimated for 1897-98 at Rs. 8,000 for transport service, Rs. 1,000 for tollage and Rs. 41,000 for irrigation, making a total of Rs. 50,000. The net revenue was accordingly Rs. 45,000, or 4 percent. on the capital expenditure, exclusive of interest charges. The interest charges on the Orissa Canals amount, however, at the present day to almost as much as the capital outlay, and adding a reduced interest charge of Rs. 9,00,000 to the capital expenditure, we should find that this range of the canal yielded in 1897-98 a profit of 2 percent. Circumstances were, however, particularly favourable last year, for traffic was large and the area under assessment for irrigation greater than it had ever been before.

The canal is available both for irrigation and traffic. It is little used by country boats, but there is a bi-weekly steamer transport service between Bhadrak

* **Report of Mr. H. C. Levinge, Chief Engineer to Government of Bengal, dated 15th February, 1879. Miscellaneous correspondence consisting of enclosures to Government of Bengal No. 1069-I., dated the 22nd March, 1878, to the Government of India.**

† Government of Bengal No. 1069-I., already referred to.

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and Cuttack under the control of the Public Works Department. This was largely used by passengers until the railway opened and continues to carry a small quantity of goods. Turmeric, chillies, cocoanuts, and betel are imported from Cuttack; and rice, tobacco, tamarind, resin and mats, the latter from Midnapor, are sent in exchange. The transport service is carried on at a profit. The total receipts on the whole canal were Rs. 47,000 in 1897-98, while the working expenses were Rs. 18,000 and the net profit was, therefore, Rs. 29,000.

There was an increase in traffic due to the construction of the railway, some of the material for which was transported by canal. The tollage receipts from country boats on the portion of the canal within this district were something over Rs. 1,000 for the past year, and these included receipts for railway material, a source of profit which is now cut off.

On the whole, tollage revenue shows a considerable decline during the last five years. When the railway is finally opened through to Cuttack in the approaching cold season the transport service will probably be closed.

The passenger traffic which has hitherto been responsible for the greater portion of the receipts will desert the canal, and the quantity of goods traffic is not nearly sufficient to enable the service to be run at a profit. In that case it is likely that some of the goods traffic will be transferred to country boats, and the tollage revenue may therefore show some improvement, provided the cost of carriage remains cheaper than by rail.

**Irrigation from the High Level canal.**

50. This is the only irrigation system in the district. The area theoretically commanded by the canal and its seven distributaries is 57,509 acres, of which 44,000 acres are actually provided with means for irrigation. The distributaries have a total length of 50 miles; 20,350 acres were under irrigation in 1895-96, 26,556 acres in 1896-97, 29,193 in 1897-98, and 29,537 in 1898-99. The latter figure includes 28,856 acres assessed at Rs. 41,470 under long lease, 171 acres assessed at Rs. 255 under season lease, and 510 acres under sugarcane lease, assessed at Rs. 2,551. The total assessment is therefore Rs. 44,276 for the present year. The long leases are granted for a term of years, generally seven, for the supply of water from June till March and are charged at Re. 1-8, or 8 annas per acre, according to the height of the lands; the low-lying fields which do not ordinarily require irrigation being rated at the lower figure. Season leases are for cotton, *muga*, cucumber, pumpkin, and *dalua* rice, and the rate paid is Rs. 1-8 per acre. For sugarcane leases Rs. 5 per acre is charged, and the increase in the area irrigated for this crop during the last three years is remarkable. In 1895-96 there were only 282 acres; in 1896-97 about the same amount. In 1897-98 the acreage advanced to 435, and now stands at 510. This is to be ascribed to the fear that such crops would be specially assessed.

During the few years preceding settlement of rents the zamindars discouraged the growing of special crops like sugarcane, tobacco, cotton, and jute, and the raiyats were also disinclined to run the risk of imposition of addition rents.

After rents had been settled, however, a new impetus was given to this description of cultivation. Rents were settled in the neighbourhood of the canal by the early part of 1897, and the next year found a considerable increase in the sugarcane area. The new water rate rules lately introduced afford some facilities to raiyats for the execution of *dalua* leases. This crop is always largely grown after a failure of the winter rice, but the normal area under it is very small. In the present year no season leases appear to have been executed for *dalua* cultivation, although in 1896, after the short *sarad* crop of the preceding season, no less than 1,993 acres were under irrigation, chiefly in pargana Bayang.

The area irrigated for cotton remains stationery at 16 acres, while the average of *muga* is 130, of pumpkin 19, of cucumber 5, and of *brinjal* 1. For the four latter species of crop no leases appear to have been taken out in 1896.

**Rents in irrigated area.**

51. Exhaustive enquiries on this subject were made in 1896, and a report was prepared by Babu Sri Gopal Bhuttacharjee, Assistant Settlement Officer. The general conclusion was that rents were not higher in irrigated than in unirrigated areas.

There was no evidence tending to show that any enhancement of rent had been made on account of irrigation, or that rents were higher in irrigable than in

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unirrigable villages. It may be safely said that collections are better in irrigated villages because the crop is more secure, and also that irrigation renders possible the cultivation of special crops which pay a higher rent, but this is the sum of the advantage derived by the zamindar. I am not disposed to think that the raiyat reaps a considerable profit after payment of the water-rate, except in the case of particular crops like sugarcane. Irrigation of rice lands is usually resorted to for the added security which it affords. It is a method of insurance which minimises the risk of loss.

If the crop experiments made by the Public Works Department be examined and some which are clearly inaccurate be excluded, it will be found that the difference in the yield of irrigated and unirrigated lands is seldom more than two or three maunds, which in itself is scarcely sufficient to compensate the raiyat for the expense and trouble of taking out a lease.

**Railway.**

52. This is a branch of the Bengal-Nagpur Railway and the construction was commenced in 1895. The line will connect Madras with Calcutta and *via* Sini, with the Central Provinces and the Punjab.

In February of 1899 the line was opened temporarily for traffic, through connection between Sini and Madras being made available. A portion of the line between Kola on the Roopnarain river and Calcutta being still under construction, the connection is made by steamer service.

A daily steamer service on the High Level Canal is, however, proposed to be maintained between these two places.

As regards the physical effect of the construction of this line, it is still early to form any estimate. The water way allowed appears to be sufficient and has in several cases been much increased since the original plans were formed. I believe if any lodgment of water is caused on the west of the bank, it will be in the neighbourhood of the river Kansbans, the flood of which is both high and sudden, but this stream rapidly subsides, and the water is not likely to stand sufciently long to do damage to crops.

Individual fields must necessarily suffer here and there, while others will be correspondingly benefited, but no general effect is anticipated. Scarcely any complaints were made by raiyats on this score at the time of assessment and if any grievance had existed, it would assuredly have been brought forward. When the Grand Trunk Road was constructed zamindars and raiyats a like were up in arms and I believe their complaints were in some instances substantial. Moreover, very liberal compensation has been paid. *

**Physical aspect summed up.**

53. Considering first the area lying between the Physical aspect summed up. Coast Canal and the sea, we have here, extending upwards from the river Gamai to the Burabalong, a great plain of grass lands, the grazing ground of herds of cattle and buffalo, with occasional sparse patches of cultivation and low scrub jungle upon the sand ridges and near the tidal streams. South of the Gamai between the protective embankment and the sea the aspect is the same. Between the Burbalong and Hanskura there is a little cultivation immediately on the east of the canal and beyond this a network of tidal creeks fringed with heavy jungle.

From the Hanskura to the Subarnarekha there is cultivation inside the wooded sand hills which run in parallel ridges along the coast. At the mouth of the latter river and along the tidal creeks spreads impenetrable jungle, and upon the north side the coast line is marked with sand ridges which protect the cultivated lands extending to the canal.

On the west of the district where the boundary approaches the hills and the lands are higher, the aspect is of a reddish rocky soil partially broken up to yield a scanty crop and exhibiting patches of jungle including a little *sâl* which rarely attains to any size. Yet in other places where the hills run precipitously to the arable lands these are often of considerable fertility taking in a supply of rain water which brings with it the vegetable sediments drained from the higher ridges.

The reminder of the district is a plain of arable lands varying in level from *pa'ts* or low lands, as the Talhati in Bayang, the Ankura *pa't* and Babaria *jheel* in Kamardachour to the stretch of higher lands in the centre running from pargana Balikhand upwards, and widening towards the town of Balasore.

* Paragraph 218 of Mr. Kingsford's Report on Balasore.



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Climate.

54. The average temperature varies from 47° to 94° during the months of December, January, and February; from 62° to 109° in March to May; from 66° to 94° during the rains, and from 56° to 92° in October and November. 116° in the month of May is the highest temperature, and 44° in the month of December the lowest recorded in recent years.

A sea-breeze, regarded as unhealthy by the native population, rises after mid-day and penetrates eight or ten miles inland during the cold and hot season. From March to August the general set of the wind, according to the matutinal readings, is from the south-west, and from September to February from the north-west.

The rainfall averages 60 inches, of which in normal years nearly 6 inches fall from November to April and 5 inches in May, propitious to the labour of ploughing; 9 inches fall in June, 12 in July, 11 in August, 11 in September and 5 in October. In April and May the district is visited by severe thunder-storms, which gather in the hills and descend upon the adjacent plains.

Of endemic diseases that known as ***Elephantiasis arabum***, but more properly in the light of recent researches as ***"Filaria sanguinis hominis"***, is the most common and attacks nearly 30 percent of the population. Fever and chill are common sickness in the cold weather, but the country is singularly free from malaria, saving only in Jaleswar thana where a severe type of this disease is prevalent and retards the growth of population. Of epidemics, cholera makes its appearances immediately before and after the rains, chiefly in the towns. It seldom spreads to any extent and causes no great mortality, though there were severe visitations in 1853 and during the famine year of 1866.

During the last sixty years, the district has not, comparatively speaking, suffered from the violent cyclonic storms and irruptions of the sea which caused so much loss of life and property during the early years of the century.

In 1831 a terrible cyclon swept over the entire district and storm waves devastated the sea face, covering the land to a depth of 3 to 30 feet and depopulating a third of the district. In July 1872 occurred the most violent storm of late years. It was accompanied with tidal irruption all along the sea coast, and some lives and great numbers of cattle were lost. Cyclones have occurred on several other occasions in 1849, 1858, 1863, 1866, 1882, 1886, and 1887, but do not appear to have been attended with loss of life. They generally cause inundations, however, and in 1887 the sea swept over the Coast Canal embankment and penetrated to within two miles of Balasore town.

Of floods the highest within living memory was that of 1868, which occurred after a fortnight of heavy rain. The month was June and therefore little damage was done to crops, though nearly every river in the district overflowed.

Of inferior height but more serious in results were the floods of 1892 and 1896 and in the latter year there was great loss of crops in the south of the district-other years of high floods are 1855, 1866 (5), 1872, 1883, 1886, 1888, 1894, 1897, and 1898.

No part of the district, except the irrigated area in the south-west is secure from drought in seasons of abnormally short rainfall. Drought, however, most commonly occurs, though not often in an aggravated form, on the upland stretching form Balikhand to Balasore town, at which point it widens across the district. Even here there is a good quantity of low-lying land so that the effect is not commonly severe.

The worst droughts since last settlement were those of 1852 in parganas Bayang and Dhamnagar, and of 1875 in Soro, both in the south; while in 1836, 1839, 1840, and 1865 the loss of crops was common to the greater part of the district and in the latter year culminated in the great famine.

* Embankments.

55. There is no comprehensive system of protective embankments in this district. In 1853 it was stated * * that the embankments measured 91 miles. Many of these were small agricultural embankments erected sometime for irrigation purposes across the beds of streams and sometimes to guard against flood.

* See map No. IV.

* * Sir Henry Ricketts' Report on the districts of Balasore.

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In a few cases zamindars were, at last settlement, allowed expenses for maintenance, but the more important embankments were understood to be under the control of Government and Mr. Mills *** stated that in "estimating the assets, regard had been had to the continuance of the embankment". It was subsequently found by the Public Works Department that many of the old zamindari or agricultural embankments were either useless or actually harmful in their effects.

These are known as Class IV, and have for many years been neglected with the intention of abandoning them at this settlement. Accordingly there are now only three embankments of this nature which the Public Works Department proposes to maintain. The reminder have been surrendered to the zamindars on the understanding that Government have nothing further to do with them. The total existing mileage under control of this Department is 84, of which a length of 74 miles is under Class I and II, and situated on the river Subarnarekha and Suma on the north, the Baitarani, Salandi, and Ganguti, in the south, and along the sea face in pargana Ankura.

**Parganas.**

56. In considering the fiscal divisions of the district, it will be convenient to notice the parganas first. These are old fiscal divisions, known as *'Bisi' or "Khand"* under the Hindu kings, and placed under the charge of revenue officials who were responsible for the collections. Under the Moguls these divisions were known as parganas, but the original designations still sruvive in some of the names, as in Nunkhand, Derabisi.

As the pargana became subdivided into an increasing number of taluks it still remained a centre of the collection system, and when, owing to alienations and combinations of the lands of various taluks, many estates became possessed of areas outside the border of their proper pargana, those areas were *de facto* included within that pargana. Hence the exietence of those numerous *tahasila-lahidas* which are such a perplexing feature of the present parganas. It has been the custom to regard any village the greater part of which belonged to an estate in another pargana as a *tahasilalahida* village of that pargana, and same confusion has been imported into the disignation of small portions of villages which belonged to an estate holding a neighbouring village, those being regarded as *tahasilalahidas* of that village and named accordingly.

The pargana divisions bear little reference to physical or other facts, and considered as local divisions they are confusing and troublesome. As exhibiting, however, a combination of a number of neighbouring estates they have some use for satistical purposes. The number of parganas* now existing in this district, so for as the temporarily-settled portions is concerned, amounts to 67.

**Thanas.**

57. I may now turn to the subject of thanas, which will naturally lead to that of villages, houses, and population.

I propose to deal with those figures in the appendix which include temporarilly-settled and *(lakhiraj)* lands and exclude permanently-settled tracts and the Kanika Ward's estate. My remarks will therefore not have reference to the latter except when expressly included. The district contains two sub-divisiens, of which the Sadar includes the five thanas-Basta, Jaleswar, Baliapal, Balasore, and Soro, with an area of 962 square miles, while the Bhadrak or southern sub-division includes four thanas-Bhadrak, Dhamnagar, Chandbali and Basudebpur, with an area of 750 square miles.

**Origin of thana.**

58. The thanas were constituted in 1806 as convenient local divisions for police administration, and the boundaries of parganas being known and familiar to the people, the thanas were as far as possible constituted of whole parganas. From the date mentioned, the district was divided into four thanas-Basta containing 551 villages, Balasore 536, Soro 622, and Bhadrak 949. In 1853 the number was six, and it is now nine. That of Basudebpur, then known as Churamon, was subsequently separated from Soro, and those of Dhamnagar and Chandabali from Bhadrak.

The thanas of Baliapal and Jaleswar in the north were included at the rivision of the district boundary in 1868. Basta and Baliapal thanas contain a considerable

*** Mr. Mill's Minute of 1851

* See appendix D. B. of the report.

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number of permanently-settled estates and Jaleswar is almost entirely permanently settled, while Chandabali contains the Kanika Ward's Estate. Of other thanas, Soro, in the centre of the district, is far the largest, containing an area of 399 square miles, 834 villages and a population of 218,000. Thanas Chandbali, Bhadrak and Dhamnagar are the most thickly populated, the density in the former reaching the figure of 647 to the square mile.

**Villages.**

59. The total number is 3,607, of which 3,044 are inhabited and 563 "*bechapari*"-literally-"without roof". On the average there are something over two villages to the square mile, and in the north of the district villages are smaller and more numerous, while in the south they are larger and fewer.

*Bechapari* villages are most common in thanas Balasore and Basta, and this is due not to the fact that there is less ground suitable for village sites, but apparently to some eccentricity of survey. The average size of a village is 304 acres and varies from 489 acres in thana Basudebpur, where the coast side *bechapari* villages are very large, to about 250 acres in the north of the district. The villages in Jaleswar are chiefly small "*Dian chaks*" or "*tahasilalahidas*" contained in permanently-settled villages. Villages generally are large and in consequence "*hechapari*" villages fewer in the south.

The average population of inhabited villages is 298, and varies from 383 in the south to 249 in the north. Inhabited villages in the south are generally half as large again as in the north.

**Houses.**

60. The total number of houses, including cow-sheds, stores, and other such buildings is 182,450 and of these 134,534 are dwelling—houses. The latter figure excludes, however the dwelling houses in the towns of Balasore and Bhadrak, which may amount to about 6,000. This gives an average of between six and seven persons to each dwelling-house. The number may be seemed large, but it is to be remembered that a dwelling—house is often of considerable extent, containing two or even three joint families, and, further, that the well-to-do raiyats frequently keep a servant who resides on his master's premises and has got house of his own.

The number need not therefore affect the estimate of the average number of persons in a family, which, including resident servants, is generally taken as between five and six. The average number of dwelling-houses in inhabited villages in the south is 57, and in the north 37; it has already been said that these villages are large in the south and they are also more thickly populated. Throughout the temporarily-settled portion of the district each inhabited village contains an average of 44 dwelling—houses to a population of 298 souls.

**Population.**

61. According to a rough census made in 1840 at the time of survey, the population amounted to 651,000. In 1865, before the famine, the figure was 732,280 and after the famine it was estimated at 485,113. If the estimate of mortality was correct, the population certainly recovered with extreme rapidity during the subsequent six years, for in 1872 it had reached the figure of 770,232.

During the next nine years the increase was 22 percent, and in 1881 the, population numbered 945,280. By 1891 it was 994,625, an increase of 5 percent and adding 3 percent for the last eight years, the present population may be estimated at 1,024,463.

The fact that since the famine of 1965-66 the population of the district has increased from 485,000 to one million marks an extraordinary power of recuperation. Taking the increase between 1865 and 1872, from 1872 to 1881, and from 1881 to 1891, we find that the percentages are 59,22, and 5, respectively, and it is not unnatural to draw the conclusion that at the present day the population has almost reached the limit which the land is capable of supporting. The 59 percent, increase in six years, though a small portion of it is due to the return of emigrant raiyats, exhibits * the rate at which, under circumstances admitting of free expansion, population may be expected to develop, but if the rate of increase from 1881 to 1891 was only 5 percent; it becomes necessary to consider to what cause the decrease is due.

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*It is also not *improbable* that the figures of the census of 1865 were wrong.

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It is obvious, in the first place, that after a large mortality and abandonment of cultivation the facility in obtaining land, and the reduction in the size of families by rendering subsistence a matter of much greater ease, encourage corresponding increase in population. As circumstances change and subsistence becomes more difficult there is a natural check to population, so long as the standard of comfort is not abandoned. But these reasons in themselves appear insufficient to account for the lower rate of increase, and as methods improperly called Malthusian are never resorted to by any except the educated classes, undoubtedly the further explanation required is found in the habit of emigration largely prevailing in the district.

**Composion of the population.**

62. Some note as to composition of the population at the census of 1881 may be of interest—

| | | | |
|---|---|---|---|
| Total population of 1891 | .... | 994,625 | |
| Males | .... | 481,638 | |
| Females | .... | 512,087 | |
| Hindus | | | |
| number | 969,211 | | |
| percentage | 97 | | |
| Musalmans | | | |
| number | .... | 24,250 | |
| percentage | .... | 2 | |
| Budhist, Christian— and others— | | | |
| number | .... | 1,164 | |
| percentage | .... | 1 | |

Of the first six castes, Brahman, Baidya, Karan, Kayastha, Kshatriya, Khandait, which rank as high, only three are numerous—

| | | | | |
|---|---|---|---|---|
| Brahmans | .... | 119,289 | .... 12 | per cent. of the total population. |
| Karans | .... | 24,773 | .... 2 | |
| Khandaits | .... | 185,852 | .... 18 | |

Of the intervening castes, most of which rank as ***Hatua*** or manual labourers—the following are most numerous—

| | | | | | |
|---|---|---|---|---|---|
| Goura | .... | 73,463 | Tanti | .... | 56,767 |
| Bhandari | .... | 17,087 | Goala | .... | 33,820 |
| Guria | .... | 13,190 | Kamar | .... | 11,194 |
| Raju | .... | 40,750 | Kumhar | .... | 11,248 |
| Chasa | .... | 20,672 | Dhoba | .... | 22,625 |
| Teli | .... | 46,890 | Rarhi | .... | 24,848 |
| | | | Keuta | .... | 26,110 |

Amongst the low castes may be mentioned—

| | | |
|---|---|---|
| Gokha | .... | 27,147 |
| Pan | .... | 54,319 |
| Kadma | .... | 33,593 |

According to the census report the agricultural population numbered 750, 607, or 75 per cent. of the total, and of these 299,000 were set down as actual cultivators

**Density of population.**

63. The present population of the District is, according to Mr. Kingsford's estimate, 1,024,463,[1] of which 908,733 are resident in the 1,712 square miles now under settlement. The largest thana, Soro, contains the largest population, viz, 212,000, while the smallest, Jaleswar, including its permanently settled areas contains 55,000. The density varies, in thanas entirely temporarily settled, from 635 to the square mile in Bhadrak to 404 in Basudebpur. The average density in the south is 572, in the north 499, and throughout the entire District 531.

That the density of population should have attained in one thana to the figure of 635 to the square mile, or one to the acre, may seem alarming. It is clear that under shuch circumstances the subsistence limit has been nearly reached. In 1793 the density in well-peopled districts of Bengal, including Bengal, Bihar, and what was then called Orissa but is now Midnapore, was estimated at 200[2] and the total population at 25,000,000. This had risen by 1882 to 60,000,000, and the density throughout Bengal rose, therefore, to 480, which is little less than the average for this District.

1. This does not quite agree with the estimate in paragraph 170, where I take the population at 1,080,000.
2. Leslie Brooke's Husbandry of Bengal, written in 1794.



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Towns

64. The only towns worthy of the name are Balasore and Bhadrak, the former with a population of 21,000 and the latter of 16,000.

Balasore[3] though it includes an extensive bazar, is in effect a collection of hamlets, and the area included within municipal limits is no less than 3,404 acres, or 5 square miles surveyed in 28 villages.

The town lies upon the right bank of the river Burabalong, about 15 miles from the mouth, though only 6 miles in a direct line from the sea. This was one of the earliest European Settlements in India, and its history presents some features of considerable interest. Popular tradition ascribes the derivation of the name to the Mahadeb Baneswar whose temple still stands in Purana Balasore. It is said that in the Dwapara Juga, or third of the Hindu ages, a demon king named Banasura dwelt in the portion of the town now known as Sunahat[4].

He established and named after himself the shrine of Baneswar, and it was his custom every morning to repair to this and to four other temples—Gorgareswar at Remua, Khajureswar near Sergarh, Bakreswar in the village of Bankeswar, and Mani Nageswar in Bardhampur—and after performance of his devotion to return to his palace by midday. Incredible as the performance of this daily journey of some 40 miles or as the very existence of the demon may appear, the survival of two great tanks lying near the site of the supposed palace of Banasura and the remains of the moat round the dwelling of his daughter, Usa' whose name still survives in that of the village Usamerha[5] may go some way to convince the modern antiquarian of the authenticity of this mythological legend. However this may be, Balasore remained an insignificant village inhabited by fishermen and milkmen until the year 1642, when the British factory was established.

As early as 1514 the Portuguese had effected a settlement at the ancient port of Pipli on the Subarnarekha, 30 miles north of Balasore. The site is now lost, and the only of European colonisation is found in the name of the pargana Sahabunder[6]. In the beginning of the seventeenth century the Portuguese settlement was deserted, and in 1635 the first British factory in Bengal was established on its ruins under a *firma'n* of the Mogul Emperor Shahjehan. Five years later the patriotism of Dr. Broughton secured permission for the erection of a factory at Balasore, and the location of Pipli having proved inconvenient owing to the silting of the Subarnarekha, the little colony removed its quarters to what is now known as the village Barbati on the right banks of the Burabalang, a mile below the site of the modern town of Balasore.

The factory was protected on one side by the river and upon the other three by a deep moat, and a native village inhabited by the artisans and weavers who worked for the company sprang up rapidly around it. The trade at this time was in "Satran'' a kind of course longcloth, and in muslin for the manufacture of which Orissa had early been famous. Though surrounded by strife and dangers, the colony continued its peaceful existence for upwards of a hundred and thirty years, and the only occasion when its security appears to have been menaced was in 1688. In that year, on the outbreak of hostilities between the British and the Mogul Emperor, when the company's servants removed in a body from the Hooghly to Balasore, the Governor of the town seized two factors as hostages, whereupon Captain Heath burned and blundered the town. But as early as the year 1700, the Burabalang, like all Orissa rivers, had commenced to silt at the mouth. and the passage of the bar gradually became more difficult. From 1751 the decline of the factory set in and it appears to have been ultimately abandoned before 1786. It was found in ruins when the British entered Balasore in 1803. The only traces of it now existing are the graveyard and a house in Barbati said to occupy the site of the old factory building. This house is now the residence of one Baidyanath Kar and was at one time the Collector's cutcherry, built by Mr. W. Blunt as Commissioner. The cemetery contains 33 graves with dates from 1684-86 * Little remains to be said as to the town itself. The residents include

3. The information given regarding the town is compiled mainly from a report submitted by Babu Abhoy Prasad Das, Assistant Settlement Officer, a resident of the town.

4 Properly "Sonita" the bloody, so-called after the fight between Banasura's men and his daughter's lover *Pradyumna*, the son of Krishna.

5. More properly Usa' berh, or the dwelling-place of Usa'.

6 Saheb-bunder, the Sahib's port.

* See paragraph 30 of Mr. Kingsford's Report, page 396 of the Appendices. Sri Henry Ricketts was buried in England and his body was not brought over, as Mr. Kingsford was informed, for interment in Balasore.

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some of the leading zamindars, such as Raja Baikuntha Nath De Bahadur, Babu Raj Narayan Das, the Mandal family, and a considerable trading community, the importance and wealth of which is rapidly on the increase. Some of the merchants are Uriyas and Bengalis, but the majority are Musalmans, Madrasis, and men of Bombay. The *Telis* in particular are acquiring considerable local influence as large money-lenders.

The town is the headquarters of the District, and the administration includes a District Magistrate and Collector with three or four Deputies, an Executive Engineer, a District Superintendent of Police, a Civil Surgeon, who is also Health Officer of the town, a Munsif, three benches of Honorary Magistrates, and a Sub-Registrar. A proof range under control of an officer of Royal Engineers has lately been established at Chandipur, near the mouth of the Burabalong, and an office and other buildings in connection with it are in process of erection in the town.

There is a jail, a general hospital, a charitable dispensary, Roman Catholic Mission with a school and orphanage, and a settlement of Free-will Baptists from New Hampshire, U. S. Just outside municipal limits, to the west, are the quarters of a District and Assistant Railway Engineer, together with the new station buildings which are now approaching completion.

The railway bridge over the Burabalong was opened on the 9th May of the current year, and though in regard to size it does not compare with those of the Brahmini and Mahanadi in Cuttack, yet it has an importance of its own as an imposing structure, as the only bridge in the Province constructed over tidal waters, and as the visible sign of the commencement of what may prove a new era in the trade and material circumstances of the District.

The climate of the town is healthy, and, with the exception of cholera outbreaks before and after the rains, there is little sickness. The rainfall is large and has averaged 70 inches during the last five years. Opium-eating is properly described as the curse of the town, which has earned for itself an unenviable reputation for the abnormal quantity of the drug consumed. The lower classes especially regard it as a preventive of chill and fever, and men, women, and children alike look upon it as an item of their daily food.

It remains to notice Balasore as a port. At the commencement of the century it was the only one of which Orissa could boast, and though after the abandonment of the old settlement trade stagnated until the British entered the Province in 1803, the circumstances of the port subsequently rapidly improved.

In 1853 the sloops numbered 167, although 44 had been lost in the gale of 1851, and the trade was rapidly increasing. Between 1848 and 1852 the annual value of the imports rose from Rs. 83,000 to Rs. 1,01,000 and of the exports from Rs. 12,600 to Rs. 1,99,000, nearly the whole of the latter being rice and paddy.

The highest export figure was reached in 1850 when the amount was Rs. 3,49,000, and the subsequent falling off was attributable to the loss of shipping in the town. The manufacture of salt gave the chief impetus to trade, and with its abandonment there was a considerable decline. It is not necessary to deal further with the present trade than to note than in 1897-98 the total value of the exports was Rs. 12,96,350 and of the imports Rs. 16,25,561, and that since 1850 a new and valuable export trade has arisen in stoneware of "Muguni" quarried chiefly in Nilgiri.

**Foreign settlements at Balasore.**

65. The British was not the only factory at Balasore, for the French, Dutch and Danes also possessed settlements. The two latter, known as Ulansahi and Dinamardanga, were ceded to us in 1846, and are now held as khas mahals and leased to Raja Baikuntha Nath De. The area of each in 7 acres. The moat round the Dutch factory known as Ulan *nala* and the graveyard, containing two old-fashioned monuments are still in existence.

The French settlement was never ceded and still remains the territory of that Nation. It is under the authority of the Administrator-General at Chandernagore. I can not ascertain whether this factory, known as Frasdanga, was ever captured by the British; but the French certainly ceased to occupy it, and under the treaty of 1783 it was restored to them with their other factories, the restoration being actually made in 1786. The area at this time appears to have been 64

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acres, which, according to the map of last settlement, had diminished to 43 acres. At the present Settlement an area of 169 acres was claimed as French territory, and Mr. Maddox was directed to enquire into the matter. He held the claim to be untenable, and his recommendation that the area should be limited to 38 acres, of which the French were actually in possession, was accepted by Government. (A considerable portion of the old area has been washed away by the river).

The lease of this French territory is disposed of annually by auction and generally fetches a considerable sum, the profits to the lessee from the Abkari revenue alone being Rs. 250 per annum. The lease realised as much as Rs. 925 in 1878, when it was purchased by the Mandal family, who were anxious to control the Frasdanga blacksmith's trade so as to hold a monopoly of it in their neighbouring bazaar. In the following year again it realised Rs. 462, the purchaser being desirous of establishing a monopoly in the liquor business of the town. The former lessee Raghunath Mahapatra made the position of both his successors so uncomfortable that neither afterwards came forward, and he purchased the lease himself 1880 for Rs. 100. It has since passed into the hands of Raja Baikunth Nath De.

The existence of Frasdanga has been a fruitful source of trouble to the British authorities. Resort to it was at one time habitually made for the purpose of disposing of stolen goods, and for other criminal purposes, and in 1893 a criminal case which attracted some notoriety was brought by Raghunath Mahapatra against the lessee on the charge of kidnapping him out of British India. All three settlements were centres for this illicit traffic in opium during the early part of the century, and the drug was smuggled into British territory in large quantities.

**Bhadrak.***

66. This is the head-quarters of the southern sub-division, and lies on the bank of the Salandi at the 43rd mile of the Trunk Road below Balasore.

It consists of a group of hamlets covering an area of some 3 square miles, and contains a population of 16,000, of which 75 per cent. are Musalmans. The town contains two quarters, the Naya bazaar on the right bank of the Salandi and the Purana bazaar on the left. The former is situated near the Trunk Road, and contains numerous lodging houses for travellers, for suitors in the courts, and for the clerks and muharrirs in Government employ.

Provisions are the chief commodities sold in this bazaar, though a short time ago some Bengali merchants opened shops for the sale of tobacco and piece-goods. The real centre of trade is, however, the Purana bazaar, where the Musalman element is strongest. The mahajans, zamindars and merchants reside here, and Messrs. Turner, Morrison and Co., have a store for the sale of Liverpool salt and petroleum. Another business for the sale of Madras salt has lately been opened up by a company for which Messrs. Macneil and Co. are the local agents.

In addition to the stores and shops there are two markets held weekly upon Wednesdays and Saturdays. Some description of these will be found under that heading, † but it may be noted here that the Wednesday market is the most important in the District, and that sales of cattle, timber and fuel take place there to a large extent.

The following are the principle articles of trade :—

***Rice*** and ***paddy*** are purchased during the five months following the ***sarad*** harvest by Bombay Nacoda merchants either from the local rice dealers or through agents who visit the smaller market.

***Salt***-Imported by merchant to a small extent from Calcutta. The chief business is done by Messrs. Turner, Morrison and Co., who, in the year ending March 1899, sold 35,191 maunds, value one-and-a-quarter lakhs of rupees, at Rs. 3-10-6 per maund.

I believe the above firm is likely to be supplemented by the new agency already referred to, since the Madras salt can be put on the market at a cheaper rate than the Liverpool article.

***Kerosine Oil***—The sales of the smaller marchants amount to an annual total of Rs. 5,000. The largest importers are, however, Messrs. Turner, Morrison and Co., who sold last year 7,536 cases at Rs. 3-11 per case; total value Rs. 27,600.

* This paragraph is written from information supplied by Baleu Harakrishna Mahanti, Assistant Settlement Officer.

† Paragraph 67

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*Cotton* —There are four merchants who import English cotton-piece goods from Calcutta to the total value of one-and-a-quarter lakhs of rupees annually.

*Cattle*—Sheik Iman and some five other Musalman merchants purchase cattle at the local markets of Bhadrak, Dhusuri Ramchandrapur, and Duhal to the number of about 9,000 annually. Taking Rs. 10 as average, the value of the trade amounts to Rs. 9,000. The cattle are sent by the Trunk Road to Midnapur, where some of them are purchased as plough oxen, but most go to Calcutta and further north where they supply the meat markets.

*Hides*—Golab Khan and half a dozen others control the trade, and the value of the export is about Rs. 72,000 per annum. The hides are sent to Calcutta, a few by Balasore; but most by Chandbali.

*Yarns*—English and Bengal twist for the manufacture of local cloth is imported to the annual value of Rs. 23,000. *Turmeric, chillies, sugar* and *cocoanuts* are imported by steamer from Cuttack by three Marwaris and by other local traders. The sugar is in the form of molasses, and *kanda*. The same merchants export resin and tamarind to Cuttack.

*Betelnut, spices, wheaten flour, refined sugar, potatoes,* and *plantains* are imported, to the annual value of Rs. 10,000, from Calcutta *via* Chandabali by Sankar Sahu and others. A small quantity of potatoes and betelnuts also comes from Cuttack.

*Ghi* is brought from the grazing grounds of pargana Ankura, and some is exported to Calcutta and Midnapore.

Though living in the town is dear and a proverbial saying runs that fuel costs a pice for half a seer, the towns people are prosperous, and even the beggars have lands* There are very respectable resident Musalman families, and they are careful to maintain a position and social observances which distinguish them from the ordinary Mahomedan community in the mufassal. The climate is considered superior to that of Balasore but there are severe outbreak of cholera in the season preceding the rains.

Market.

67. The number of markets in the temporarily-settled portion of the District is 59, and particulars of area, position, assessment and of the commodities ordinarily sold at each will be found in the Appendix referred to.

Many of the markets are situated on *bahal*, and the most important of all, that of Bhadrak, on *bazyafti* land. The total assessment imposed on the zamindar in whose estates markets lie amounts to Rs. 783, and it was fixed as a ground rent varying from Rs 1-3 to Re. 210 per acre.

Though, with a few exceptions, they are not of great size, they are well distributed for the supply of local wants and as centres where grain collects for export. It is likely that, in the course of the next few years, markets of considerable size will spring up in proximity to the railway stations, and some that now exist in less convenient situations will decline.

The commodities ordinarily exhibited for sale include cottons of local and English manufacture, brass and bell-metal utensils and ornaments, kerosine oil, provisions of all sorts, such as paddy, rice, salt, spices, molasses, dried fish, vegetables, *dal*, fruits, fresh fish, castor and mustard oil, grain, confectionery, fried rice, milk and *pa'n* for chewing, earthenware pottery, blacksmiths-ware, mats, brooms, fuel, cheap finery, hair oil, mirrors, combs, soap, needles, pins, tobacco, *sa'l* leaves, scrap-iron, cotton, thread, string, rope, and small utensils and lamps made of tin.

At markets of a larger size there is often a trade in special articles including cattle, timber, charcoal, yarn, tamarind, resin, druge (opium, *bhang* and *ganja*) medicines, *ghi, tari* and Uriya books and tracts sold by the missionaries.

In the cold season Kabuli pedlars sell warm cloths of various descriptions. The regular shop-keepers do a lucrative trade, and make a profit from 50 to 100 per cent.

From noon till 9 O' clock at night the Uriya market presents a busy scene. The traders set out their wares each in his appointed place. The drummer and

* One of these professional beggars on receiving a dole of rice from an Assistant Settlment Officer in the town proceeded to urge some grievance with reference to the assessment of his *thani* holding.



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flute-blower make music at every shop in turn and receive a few pies or a small article exposed for sale. The sweeper collects a similar contribution. The village postman attends to deliver letters, and the zamindar's peons to press the raiyats for their rents. People, women predominating, flock in with rice or fish for sale and to make purchases for the weekly family wants. The *dandidar*, or weigher appointed to supervise the markets, goes round to receive his commission on the sales or to give his opinion in the rates to prevail for the day. The gomasta, of the zamindar, or of the the *ijardar* who has taken a lease of the market, collects his fees (*tola*) in kind or cash, or some times a stipulated annual rent from every shop. The money changer exhibits piles of small coins and cowries and a shop keeper may be seen bartering his good in exchange for some articles of domestic requirements.

In the north of the district the three markets of most importance are Singla in Nangleswar, Deula in Bhograi, and Shahaji in Remna near Balasore. The average attendance at these is probably seven or eight hundred, and people come to them from a distance of 10 or 12 miles.

The two daily markets of Balasore town are entitled to some notice. The more important is that in the centre of the town, belonging jointly to the zamindars of the Mandal family, Babu Rasik Charan De and Babu Dolgobinda Ghose.

The market contains some brick buildings erected by the Mandals, and these are occupied by the fish and vegetable sellers. The Mandals are proprietors of the fishery estate in the river Burabalong, and have shown some enterprise and business capacity in providing the fishermen with means for disposing of their catch.

Vegetables from Remna and the villages near the town, sea-fish from Chandipur on the coast, seasonable fruits, including pineapples, guavas, plantains and a species of orange from the *Garhjats*, are daily brought for sale, and at the bi-weekly market there is a trade in brass and bell metal ornaments and utensils, and in cloth which is largely, purchased by Santhali women from the *Garhjats*. At the approach of the rains *chamars* bring umbrellas, hats and *pakhias** of palm-leaf and bamboo.

The markets are let out to contractor, who collect fees generally half a pice per day, from the sellers. The shops are paid for at from Re. 1-8 to Rs. 2-8 a month. The lessee of the vegetable markets pays a rent of Rs. 25 per month, and Rs. 15 a month is paid by the *ijaradar* of the fish market. The market is capable of improvement and requires a supply of drinking water. It is under the control of the Municipality, which levies a quarterly tax of Rs. 35.

The other market is situated on the Trunk Road and was constituted as a *sarai* for travellors. The trade is in provisions only. It is let out annually by the Municipality by auction, and the rent now realised is Rs. 106. It contains lodgings for travellors and suitors in the Courts, but with the advent of the Railway its importance as a *sarai* for travelloers is declining. The lodgings are now occupied by Railway contractors and coolies.

In the south may be mentioned Chandbali Jamjhari on the Trunk Road between Soro and Bhadrak and Turigaria in Mangalpur; but the most important of all is that of Bhadrak known as Esafpur.

This consists, in fact, of two markets, one of which is situated on *bazyafti* land and the other on that of Babu Radhakanta Rai Mahasoy, Zamindar. The latter has been lately established and has attracted much of the trade of the older market.

The specialities of the old market are timber and cattle; the yearly sales of the latter averaging 6,500, value of Rs. 39,000, which gives a price of Rs. 6 per head. Each purchaser pays to the *ijaradar* a fee of 3 pies per rupee, while the sellers pay a similar amount per head of cattle and the total fees derived amount to Rs. 700. Various portions of the markets are let out annually to *ijaradars*, the leases being disposed of by auction.

The fee levied on the sale of timber varies from 1½ to 6 pies according to size, and the annual amount paid by the *ijaradars* of this portion was found to be Rs. 120/-. The income derived from shops is Rs. 700. The total annual sum realised by the *bazyaftidar* after deductions of the *ijaradars'* profits on cattle and miscellaneous shops, probably does not fall short of Rs. 1000. †

* A shade of palm-leaves to protect the head and back from sun and rain.

† Particulars obtained from an enquiry by Babu Prasanna Kumar Banerjee, Assistant Settlement Officer.

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68. The tendency of Balasore rivers to silt at their mouths has been fatal to the stability of almost every port in the district. It was on this account that Pipli was abandoned in 1642, and the same cause led to the decay of Balasore during the last century.

Ports.

In the Year 1871 there were said to be seven principal ports—Subarnarekha, Sartha, Chhauna, Balasore, Laichanpur, Churamon, and Dhamra (including Chandbali ). Owing to the silting up of the river mouths and to the construction of the Coast Canal which facilitated the silting while it also provided a new waterway, and to the abandonment of the salt manufacture, some of these have ceased to exist, while the position of others has been changed. Thus Subarnarekha is now represented by Batanga and Mandhata on the coast Canal and Barbatia on the Gochida river. Panchpara has taken the place of Sartha; Chauna, Laichanpur and Churamon* have ceased to exist. A new port has formed at Baliapal on the Matai river, and Chandbali has absorbed the trade of the old port of Dhamra situated 15 miles lower down the river at the confluence of the Matai.

Some account may now be given of the seven existing ports, in the order of their importance, with the exception of Balasore which has been already treated of as a town.

The establishment of this port is due to the enterprise of Captain Macneil, who, thirty years ago, sailed up the Dhamra with Mr. Ravenshaw, Commissioner of Orissa, with the intention of discovering a suitable site. Chandbali, which was then a small village occupied by a few fishermen's huts, was found to combine the advantages of high position free from all risks of inundation, and sufficient depth of water in immediate proximity to the river bank. Captain Macneil immediately obtained a lease of a small area of land by arrangement with the zamindar.

Subsequently Government, recognising the advantages of the site, acquired an area of 179 acres, which now forms the Chandbali Khas Mahal and includes the lands leased by Captain Macneil. These eventually passed into the hands of the India General Steam Navigation Co. and Messrs. Macneil and Co., to whom the leases were first granted by Government in 1877.

The area held by the two companies now amounts to 12 acres and, besides offices and ware-houses, contains a flourishing bazar which occupies one-third of the area. The tenants of the companies payrents amounting to Rs. 2,500, and the rents payable by the companies under the leases lately granted amount to Rs. 168.

Chandabali lies on the north bank of the Baitarani river some 8 miles west of its confluence with the Brahmani and 20 miles from the mouth. It is connected with the interior by the river Natai, the Bharak road, and various tidal creeks. The river frontage area is small and contains chiefly the companies' warehouses, bazar and lodging houses. At the divergence of the Bhadrak road there is a second bazar and a flourishing market.

Mandhatta is situated on the Coast Canal a short distance above the crossing of the river Haskura. This port has been in existence but a few years, and is of growing importance.

A bazar including a number of stores has been established, and rice and paddy together with a small quantity of *birhi* from Singla market are collected by the merchants for export to Calcutta in country boats by the canal. The total value of the exports amounts to about Rs. 90,000. The imports include the usual items—English cloths, English and Bengali yarn, betelnut, spices, kerosine oil, patatoes, and turmeric, and the total value amounts to Rs. 70,000.

Baliapal on the river Matia near Karanjaria bungalow affords a trade centre for pargana Ankura and part of *killa* Kanika. The chief export is rice which, to the annual value of a lakh of rupees, is despatched in sloops to Calcutta, Madras, and to the Laccadives and Maldives.

Barbatia on the Gochida river, a tributary of the Subarnarekha, exports rice paddy and mats to Calcutta in country boats by the canal, and also in small

* Once a centre of salt and rice export. The zamindars in 1832 levied a tax of Rs 578 on the export of rice alone.

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sloops by sea. The value of the exports amount to less than a lakh and the imports include the customary articles, but are chiefly oil and cloths.

Batanga is situated on the Coast Canal some 6 miles north of Bhograi lock and not far from Deula market. Some Bombay merchants have established stores here and export rice, to the value of about half a lakh of rupees, *via* the Coast Canal to Calcutta whence it is sent to Bombay.

Other centres from which a small export trade is carried on, but which are hardly worthy of the name of ports, are Talpada, Inchuri, and other places along the Coast Canal, where, perhaps, a single trader has established himself. At Churakhai, on a tidal creek communicating with the Panchpara river and adjoining the Trunk road 12 miles north of Balasore, is a warehouse belonging to a Contai merchant, whence country boats laden with rice travel down into the Coast Canal and so to Calcutta, returning with oil and other commodities.

A similar centre in Panchrukhi on a tidal creek connecting with the Subarnarekha near Jamkunda. There are two stores here, and rice is exported to Calcutta.

Soil. 69. Lands are ordinarily of three classes—

(1) ***Jala*** or rice lands.

(2) ***Pal*** or riverside lands enriched with silt deposit. These grow tobacco, cotton, ***rabi*** crops, and best paddy.

(3) ***Kala,*** the high lands of the homestead, which generally grow vegetables. These are constantly enriched by manure and refuse of all kinds, and are locally known as ***bazefasal*** or capable of growing every description of crop.

Soils are further distinguished as *Matial,* which includes a large proportion of clay and grows *biali, sarad,* sugarcane, *kulthi,* and other ***rabi*** crops.

***Dorasa,*** a mixture of clay and sand; gorws *biali* and *sarad,* rice, sugarcane, *kulthi,* and other *rabi* crops.

*Baliara,* sandy soil; grows *sarad* rice.

*Chikta Matial,* adhesive clay; grows *sarad* rice

Two further classifications under which all lands fall are—

*Dangar,* upland soil; grows sarad.

*Gahir,* low land soil; grows *sarad* and *dalua.*

Lands growing *sarad* are generally classed according to their situation. The first class or *aul* includes all soils which retain moisture up to the time when the ear is fully ripe. Homestead and alluvial lands also rank under this class on account of their speceal fertility.

The second class or *doem* includes the medium level soils which only retain moisture up to September. Inferior and sandy soils rank under the third class or *soem.* There also exists a fourth class, and sometimes a fifth and sixth.

Crops.* 70. Mr. N. N. Banerjei in his report on the Agriculture of Cuttack has given on this subject a quantity of information which is equally applicable to this district, and I shall therefore treat the subject as shortly as possible. Paddy is the principal crop and includes three distinct classes-*sarad, biali,* and dalua.

Of the 7,76,000 acres of cropped land in the area under settlement of rents no less than 7,08,000 or 91 per cent. are under sarad rice. Three descriptions are recognised— *asu* grown on high lands, *kanda* grown on land of mean level, and ***garu*** grown on low lands. On the higher level the crop is sown broadcast, but in the low lands, especially in parganas Ankura, Bhera, Kaima, and Bayang, it is transplanted becuase in such parts the water gathers more quickly, and would wash away the seeds or drown the early seedlings. But transplantation is also resorted to for a better crop, since only the strongest seedlings are planted and the better class of raiyats passes *talha is,* plots of good high land, generally within their homestead and specially reserved for growing the paddy for transplantation. A quarter of an acre of *talhati* suffices for the transplantation of four times that area. The transplanted crop is expected to yield from one to five maunds in excess of that sown broadcast.

The sowing is the work of May or June according as the rain is early or late. ***Asu*** is reaped in August or September, ***kanda*** is September and October, and

* See appendix F. The estimateds in the paragraphs are Mr. Kingsford's and do not always agree with those in Chapter VI.

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*garu* from November to January. The yield is from 10 maunds of paddy to the acre in the unfertile tracts, such as Ambohatta, to 30 maunds in the best reverside lands on the Burabalong below Balasore, on the virgin soil of the reclaimed lands by the Subarnarekha, and in some parts of Ankura. The greater part of the district yields an average of 18 maunds in fair seasons; but taking good and bad lands alike, and with due regard to the floods and drought to which the country is periodically subjected, the average outturn is estimated to be very little more than 15 maunds. Excluding experiments not worthy of credit on the jail lands in the Balasore town, and excluding also those of the Public Works Department which are taken on one twenty-fifth of an acre, and that the best portion of the best field, I found that experimental cuttings gave an average of 20 maunds of paddy and 22 maunds straw per acre.

***Biali*** rice is grown in small quantities, but in almost every part of the district. The average area under this crop is 5,400 acres or not a hundredth part of that under ***sarad***. It is sown upon high lands in the month of May, and reaped in August and September. Being thus an early crop, although the cost of raising it is high and 50 seers of seed are requisite for an acre, it is grown on a portion of his holding by the tenant who has no store of rice or who is being pressed by his landlord for payment of rent. The yield is 10 or 12 maunds of paddy to the acre.

***Dalua***—The area shown under this crop is only 8000 acres, but varies considerably from year to year. There is little ground suitable for its cultivation, for it requires a low level and facilities of irrigation. Sown, or more commonly transplanted, in December and January, it is harvested in April and May, and the field is from 8 to 12 maunds. The crop is scarcely grown except in Dhamnagar, Bayang, Senaut, and Bhera in the south of the district, and though the normal area under it is small, it is largely sown after a failure of the ***sarad*** rice. Thus after the drought of 1895, when the sarad crop was destroyed, no less than 2,000 acres were put under irrigation from the high level canal, and the area irrigated from other sources was probably as great.

Other food-grains grown include ***mug, birhi, Kulthi, chana, arhar***, all of which are pulses, ***make*** (maize) and ***barguri***, a description of bean, but which may rank as a pulse. The total area under these crops is only 8,000 acres; they are generally grown on twice-cropped lands, and are named in the order of their importance.

***Mug*** is of three kinds—***dhala, kala,*** and ***jai,*** the latter being in the greatest demand on account of its superior flavour. It is sown broadcast in August and September and reaped in December and January, the average outturn being from 2½ to 3½ maunds. It is eaten as ***dal***.

***Birhi*** is similar to ***Mug,*** and is sown broadcast during the rains.

***Kulthi,*** grown chiefly in Senaut, Randia Orgora, and Dhamnagar is sown in November and cut in February. It is the cheapest of the ***rabi*** crops, and is commonly eaten as dal by the poorer classes.

***Chana*** is sown in August and September and reaped in December, It is eaten as ***dal***.

***Arhar*** is sown in June on ***kala*** lands and reaped in December. The plants grow to a considerable height.

***Maka*** is a crop grown in homesteads only. It is sown in July, and in September; the cobs are plucked and eaten fried. It is chiefly produced in Senaut, Kundi, and Sahabunder.

***Barguri*** is very similar to ***chana***. It is eaten as ***dal*** and is also used for the preparation of sweetmeats.

**Oilseeds.**

Oilseeds, include mustard (***sarisa***), castor oil (***gaba***) linseed (***tisi***), and sesamum (***til***), and the area covered by these crops is 600 acres. Mustard is sown broadcast on ***pal*** lands and in homesteads during October and November and reaped in February. It is grown chiefly in Senaut, Sahabunder, Bhograi, Kundi, Phulwar, and Sunbat. Generally a tenant puts only a few ***gunths**** under this crop, and the yield is about 10 seers per ***gunth***. Mustard oil is used for cooking purposes and by the better classes for anointing the body after bathing. Four seers of seed yield one of oil.

* One twenty-fifth of an acre.



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The castor oil plant is grown in similar fashion, it prefers a dry soil, and requires water only when the fruit is riped. The yield is about 3 maunds per acre, and a maund of seed will yield seers of oil. The oil is cheaper than that of mustard, and is used by the poorer classes for the same purposes.

Miscellaneous crops.

Spices, including coriander seed, *(dhania, Joani* * and aniseed *panamohure)* cover an area of about 100 acres and are grown on *pal* lands or in homesteads, being sown broadcast in November, and reaped in February.

Sugarcane—The area is recorded as less than 500 acres, but this figure does not represent actual facts. The crop is chiefly grown in Dhamnagar under irrigation from the High Level Canal, and no less than 500 acres were irrigated this year in the pargana named. The acreage now under sugarcane may be estimated at 700 acres. The two varieties are *kantari* and *bansia*, the former of which gives a better yield. The crop needs careful attention and a plentiful supply of water. The cuttings are planted in rows during January and February, and the crop is reaped in October and November. The cane is crushed in wooden mills worked by oxen, and the process of extracting the *gur* is a wasteful one.

At Bhadrak there are also some fifteen or twenty mills of a more modern make, which are let out to the cultivators. The yield of *gur* is from 25 to 60 maunds per acre, value Rs. 125 to Rs. 300 at Rs. 5 per maund; but the cost of cultivation † is Rs. 60 or Rs. 70 per acre and the crop is, therefore, not to be grown except by well-to-do raiyats who can afford the expenditure of capital. Moreover, the crop is thought to exhaust the soil, and the same land is not put under cane for more than two consecutive years, after which it lies fallow another year.

Cottton and jute cover 200 acres. The latter is grown in small quantities throughout the district, and generally in homestead lands. In the north it is found most frequently on the bank of the Subarnarekha. Of cotton the two varieties are *bara* and *chota*. The former is grown on homestead land and attains a height of 7 or 8 feet, yielding a crop for several years. The latter is grown on riverside lands, the seeds being mixed with cowdung and sown broadcast during November. The harvest is taken during April, and the yield to the acre is about a maund of cleaned cotton which may sell from Rs. 20.

Tubacco is grown upon some 20 acres of riverside lands in Dhamnagar and Senaut, and the yield is said to be 8 maunds, which may be value at Rs. 160. The cost of cultivation does not exceed Rs. 60 per acre.

***Pân,*** or betel leaf, is grown on 120 acres, chiefly in Bhograi, where, however, the area has decreased since last Settlement. One village, Kalyani produces the crop in the centre of the district, and some is grown in the neighbourhood of Bhadrak. The plant is a creeper grown on a raised garden, one or two *gunths* in size, carefully fenced in and covered with a thatched roof. About 6,000 plant grow on a garden of two *gunths* and the leaves are thrown out in pairs at regular intervals, about four being plucked from each stem every month.

The leaves sell at an average price of 1,500 per rupee and the value of the yearly out turn is Rs. 190; the expenditure is Rs. 50 ‡ and the profit is therefore Rs. 140. The average life of a garden is eighteen years. The cultivation is in the hands of a special caste, the *Baraji* or *Bauri* of Bengal.

***Inkar*** covers an area of 100 acres. This is a reed generally found growing on wet lands in the vicinity of *pân* gardens, and is used in thatching the outer fence and as a support for the plant.

Miscellaneous vegetables are largely grown on the homestead lands which cover an area of 41,700 acres. An area of 1,300 acres is shown under *Brinjal*, and other vegetables, include pumpkin ( *boital* ), cucumber ( *phuti* and *Kakuri* ) and melon *( tarbuj ).*

These are grown most largely in Remna, Phulwar, and Kundi, for the supply of the Balasore market, and in Randia Orgara, Senaut and Dhamnagar, for that of Bhadrak.

* I do not know what the name is.

† Mr. Arnott makes it Rs. 218.

‡ See Paragraph 154.

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# CHAPTER IV.

## STATISTICAL AND PHYSICAL DESCRIPTION OF THE SADAR SUBDIVISION OF THE PURI DISTRICT.

(This chapter was entirely written by Mr. H. McPherson in 1898-99. Only the figures have been revised.)

**Situation and boundaries.**

71. Puri, the southernly district of the Orissa Division, is also the most southernly district of the Bengal Presidency, It lies between 19°28′ and 20°26′ north latitude and between 85° 00′ and 80° 30′ east longitude. The District is divided by physical feature, historical tradition, and administrative arrangement into two distinct portions. The hill country to the north-west included in the Government estate of Khurda occupies two-fifths of the total area of the district and is known as the Khurda Subdivision. The remaining three-fifths of the district known as the Sadar subdivision consists of a deltaic alluvial plain stretching from the base of the Khurda hills to the Bay of Bengal.

The Sadar subdivision is situated between 19° 28′ and 20° 22′ north lalitude and between 85°12′ and 86° 30′ east longitude.

Its general shape is triangular. If we take the point where the Bengal and Bombay Presidencies meet on the coast line of the Bay to be the apex of the triangle then the base is the Cuttack boundary, a line 40 miles in length. The shore of the Bay forms the south-eastern and longer side about 90 miles in length, and the north-western and shorter side about 80 miles in length is the Khurda boundary.

Puri town, the head-quarters of the district, stands on the sea-shore about half way down the south-western side of the triangle, at 19° 48′ 14″ north latitude and 85° 51′ 39″ east longitude.

**Area.**

72. The total area of the Puri district is 2,499 sqare miles. The area of Khurda subdivision is 971 square miles and of the Sadar subdivision 1,528 square miles. The present report is concerned only with the temporarily-settled parganas of the sadar subdivision. To ascertain the area of this portion it is necessary to exclude from the total the following items :—

| | | Square miles. |
|---|---|---|
| I.— Permanently-settled parganas — | | |
| (i) Marichpur | .... | 53·29 |
| (ii) Andhari | .... | 16·10 |
| (iii) Malud | .... | 15·35 |
| (iv) Parikud | .... | 67·52 |
| (v) Bajrakote | .... | 17·08 |
| (vi) Manikpatna | .... | 24.14 |
| | | 193.48 |
| II.— Chilka Lake, so far as included in the Sadar Subdivision | .... | 310·35 |
| III.— Lands of Khurda *Killa* | .... | 42 |
| | Total | 546 |

There remains a balance of 982 square miles. This is not entirely temporarily settled. A large number of villages, portions of villages, and parcels of land are held revenue-free and are altogether excluded from the areas of temporarily-settled estates. The area of these revenue-free lands amounts to 145 square miles.

There are also 10 square miles of permanently-settled tenures within the Kodhar Khas mahals.

Lands occupied by various departments of Government and excluded from revenue-paying estates cover an area of 6 square miles.

If these items be excluded, the area of revenue-paying estates falls to 821 square miles* though the revenue returns show only 818 square miles temporarily settled.

* For explanation, See Chap. XXI.

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Puri estates have land in Cuttack district and some Cuttack estates h lands in the Puri district. For the former an addition of 5 square miles, and for the latter a deduction of 5 square miles, has to be made, so that no change is made in the temporarily-settled area.

**Administrative Divisions of the Sadar Subdivision.**

73. There are two recognised divisions of the Sadar Subdivision the first Magisterial by Thanas, and the second collectorate by Parganas. The former was originally made for purposes of Police administration, whereas the Pargana was the old fiscal division obtaining from the days of the Hindu Rajas. It is now proposed in Orissa, as in Bihar, to extend the application of the Thana and to make it the general unit for all administrative work. The Pargana Division will subsist only in certain estate registers and records for which an arrangement by Parganas appears to be indispensable. Puri is divided into three Thanas, viz, Gope, Pipli, and Puri, and into 24 Parganas. The areas of the Thanas are respectively :—

| | | Sq. miles. |
|---|---|---|
| Gope | .... | 339 |
| Pipli | .... | 331 |
| Puri | .... | 858 |
| | Total | 1,528 |

This total includes 42 square miles of the Khurda Subdivision, which for Police purposes, is included in Thanas of the Sadar Subdivision.

The following is a statement of the areas of Parganas arranged alphabetically :—

| Name of Pargana | Area in Sq. miles. | Name of Pargana | Area in Sq. miles. |
|---|---|---|---|
| Andhari .... | 16·10 | Total brought forward .... | 579·22 |
| Antrodh .... | 53·20 | Kurelo .... | 20·18 |
| Astrang .... | 8·97 | Lembai .... | 89·86 |
| Athaisi .... | 52·13 | Malud .... | 15·35 |
| Bajrakot .... | 17·08 | Manikpatna .... | 24·14 |
| Banchas .... | 30·33 | Matkatpatna .... | 10·48 |
| Chaubiskud .... | 100·32 | Marichpur .... | 53.29 |
| Dumarkhand .... | 29·49 | Oldhar .... | 41·12 |
| Kanman (Tappa) .... | 6.50 | Parikud .... | 67·52 |
| Khodar .... | 27·46 | Paschimduai .... | 26·01 |
| Kotdes .... | 182·08 | Purbaduai .... | 32·63 |
| Kotrahang .... | 55·56 | Rahang .... | 150·34 |
| Total carried forward | 579·22 | Serai .... | 67·32 |
| | | Total .... | 1,177.46 |

The Pargana and Thana totals do not tally, because Thanas Pipli and Puri both include detached portions of Khurda Subdivision and Thana Puri in addition comprises a large expanse of the Chilka lake, which is not included in any Pargana.

It will be seen from the above figures that Thanas Gope and Pipli are of nearly equal size and are much smaller than Thana Puri, but the latter includes, besides the Chilka Lake, Puri town, for which there are separate Police arrangements. Puri town is comprised in 16 survey villages, and has an area of 2·92 square miles. If the town and the Chilka be excluded from the Sadar Thana, then we have for its true dimensions an area of 545 square miles with 786 villages. Even so reduced, it is much larger than either of the other two Thanas.

Of the Parganas, Kotdes is the largest, with an area of 182 square miles, and Tappa Kanman, the smallest, with an area of 6·50 square miles. The average size of the Pargana is 49 square miles.

**Division into villages.**

74. There are 2,145 villages in the sadar subdivision, grouped as follows under their respective Parganas and Thanas.

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The area of the Parganas in acre and the average size of a village in each Pargana have been added :—

| Name of Pargana. | Area in sq. miles. | No. of Villages. | Average area of Village in acres. |
|---|---|---|---|
| P. Andhari .... | 16·10 | 18 | 572 |
| Antrodh .... | 53·20 | 127 | 268 |
| Astrang .... | 8·97 | 16 | 359 |
| Athaisi .... | 52·13 | 70 | 477 |
| P. Bajrakot .... | 17·08 | 21 | 521 |
| Banchas .... | 30·33 | 58 | 335 |
| Chaubiskud .... | 100·32 | 180 | 357 |
| Damarkhand | 29·49 | 74 | 255 |
| Kanman (Tappa) | 6·50 | 18 | 231 |
| Khodar .... | 27·46 | 45 | 391 |
| Kotdes .... | 182·08 | 355 | 326 |
| Kotrahang .... | 55·56 | 190 | 187 |
| Kurelo .... | 20·18 | 52 | 248 |
| Lembai .... | 89.86 | 234 | 246 |
| P. Malud .... | 15.35 | 10 | 982 |
| P. Manikpatna .... | 24·14 | 12 | 1,288 |
| Matkatpatna.... | 10·48 | 8 | 839 |
| P. Marichpur .... | 53.29 | 56 | 609 |
| Oldhar .... | 41·12 | 49 | 537 |
| P. Parikud .... | 67·52 | 61 | 720 |
| Paschimduai.... | 25·01 | 62 | 269 |
| Purbaduai { Puri Town | 2·92 | 16 | .... |
| Purbaduai { Rest of Pargana | 32·63 | 73 | 286 |
| Rahang .... | 147·42 | 236 | 400 |
| Serai .... | 67·32 | 104 | 414 |
| Total .... | 1,177·46 | 2,145 | 351 |

The Parganas marked P (p) are the permanently-settled Parganas. A similar statement to the above is given *Thanawar* (including detached villages of Khurda, excluding Chilka Lake)—

| Name of Thana. | Area in sq. miles. | No. of Villages. | Average area of Village in acres. |
|---|---|---|---|
| Gope .... .... | 339 | 614 | 353 |
| Pipli .... .... | 331 | 794 | 264 |
| Puri {Town .... .... | 2·90 | 16 | 118 |
| Puri {Rest of Thana .... | 545 | 786 | 443 |
| Total | 1,218 | 2,210 | 351 |

These figures show that in the District as a whole there are nearly two Villages to every square mile of country. Kotraheang is more thickly studded with villages than any other Pargana. The permanently-settled Parganas are the most sparsely populated, as they all comprise large unculturable areas of river, marsh, and shore sand.

75. At the beginning of last Settlement there were 263 temporarily-settled estates in the Sub-division. Their number has been increased by partition in the

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**Division of Estates.**

course of the Settlement to 475. The distribution of estates by Parganas according to the Collectorate registers is as follows :—

| Name of Pargana | Number of estates at ast settlement | No. of estate at present. |
|---|---|---|
| Antrodh .... .... | 3 | 5 |
| Astrang .... .... | 1 | 1 |
| Athaisi .... .... | 7 | 14 |
| Banchas .... .... | 18 | 41 |
| Cahubiskud .... .... | 13 | 16 |
| Damarkhand .... .... | 13 | 16 |
| Kanman (Tappa) .... .... | 2 | 2 |
| Khodar .... .... | 2 | 3 |
| Kotdes .... .... | 16 | 35 |
| Kotrahang .... .... | 50 | 78 |
| Kurelo .... .... | 8 | 8 |
| Lembai .... .... | 7 | 7 |
| Masrud .... .... | 3 | 3 |
| Oldhar .... .... | 16 | 21 |
| Paschimduai .... .... | 36 | 109 |
| Purbaduai .... .... | 31 | 64 |
| Rahang .... .... | 21 | 22 |
| Serai .... .... | 8 | 8 |
| Sultan-nager .... .... | 1 | 3 |
| Saidabad .... .... | 7 | 19 |
| Total | 263 | 474 |

Partitions have been most numerious in Paschimduai, Purbaduai and Kotrahang. In these Parganas the process of subdivision has ben carried to such a ridiculous extent that prior to re-settlement they contained 57 estates paying less than Rs. 10 of revenue and three paying less than Re. 1.

A limit to the partition of temporarily-settled estates of the nature of that provided in Section II of the old Partition Act VIII (B.C) of 1876 for permanently-settled estates has been provided for all revenue-paying estates in Section II of the new Act V (B.C) of 1897.

Allowances were originally granted to zamindars on the theory that they relieved the State of the trouble, expense, and risk of collecting the small sums payable by individual raiyats. When by excessive partition the amount payable by the zamindar becomes less than the amount realisable from the average raiyat, the State gets no *quid pro quo* for the allowance it makes to the zamindar. This has been recognised in the new Act, and the line has been drawn at Rs. 10.

**Revenue of Estates.**

76. The extent to which estates differ in size may be judged from the fact that the largest estate in the District, viz., Kotdes, tauzi No. 44, paid before re-settlement a revenue of Rs. 81,082 and the smallest, viz., Salpuradang, tauzi No. 479, a revenue of Rs.14.

A classification of estates by former revenue yields the following results :-

| Rs. | Rs. | No. of estates. | Rs. | Rs. | No. of estates. |
|---|---|---|---|---|---|
| 1 to | 10 .... | 64 | 1,000 to | 5,000 .... | 31 |
| 11 to | 50 .... | 131 | 5,000 to | 10,000 .... | 1 |
| 50 to | 100 .... | 75 | 10,000 and | over .... | 5 |
| 100 to | 1000 .... | 177 | | | |

The average amount of revenue was Rs. 604 per estate, the estates which paid a revenue exceeding Rs. 2,500 may be especially mentioned; they are given in order of magnitude :—

Kotdes, tauzi No. 44 .... 81,288 Kotdes and Antrodh Pargans
Delang, tauzi No. 257 .... 33,754 Lembai Pargana
* Rahang tauzi No. 268 .... 25,895 Rahang „
* Krishnagar tauzi No. 270 .... 19,583 Serai „
* Krishnachander, tauzi No. 270....12,661 Chaubiskud Pargana

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| | | |
|---|---|---|
| Kotsahi, tauzi No. 61 .... | 5,392 | Kotrahang Pargana |
| Pipli, tauzi No. 62 .... | 4,523 | |
| Khodar, tauzi No. 251 .... | 4,189 | Khodar Pargana ( a Government estate) |
| *Killa* Kokal, tauzi No. *421* | *4,163* | Chaubiskud -do- |
| *Killa* Rovang, tauzi No. *130* | *3,383* | do -do- |
| *Killa* Gobra, tauzi No. *189* | *2,514* | *Athaisi* -do- |

The three estates marked with an asterisk were, during the late Settlement, held *Kha's* on account of the recusancy of the proprietors. The amount shown against them represents the average net income derived from them by Government over a series of eleven years.

77. The information that has been given above has reference to the old *jamas* payable by estates previous to the present revision of Settlement.

Regrouping of Estates in blocks.

In writing the assessment reports of the new Settlement it has been found convenient to adopt an arrangement which differs slightly from the *Parganawar* arrangement obtaining in the last Settlement.

In the first place what may be called the obsolete or paper Parganas—

Mahal Musrud, Saidabad, and Sultan nagar—have been discarded. These were not territorial divisions of the District, but merely names given to small detached areas scattered over numerous Parganas and included within the bounds of certain estates. In some cases they extent to the adjoining district of Cuttack. They have never been recognised as territorial units by the Survey Department either at last or the present Settlement, and their areas have alwaye been included within the Parganas to which they geographically belong.

In the next place it has been found convenient in a few cases to group together and re-arrange Parganas because they have possessed some important feature in common. The new division have been styled "Blocks", and are as follows :—

| Name of Block. | Parganas included. | Reason for arrangement. |
|---|---|---|
| Kotdes | Kotdes<br>Antrodh | Because more or less conterminous with Kotdes estate, tauzi No. 44. |
| Khodar | Khodar<br>Kurelo<br>Kanman (Tappa)<br>Astrung | Because alike liable to inundation from the Debi and Prachi rivers. |
| East Athisi & Damarkhand. | East Athaisi & Damarkhand. | Because more or less conterminous with *Killa* Gobra, and alike liable to inundation from the Prachi and Kadua rivers. |
| West Athaisi and Matkatpatna | West Athaisi<br>Matkatpatna | Because alike liable to inundation from the Kushbhadra rivers. |
| Lembai | Lembai | Single Pargana |
| Kotrahang | Kotrahang | -do- |
| Paschimduai | Paschimduai | -do- |
| Purbaduai Oldhar | Purbaduai (include Oldhar, portion of Matkatpatna and Athaisi.) | Because alike liable to inundation from the Bhargabi (Adlabad breach), the Dhauna and Kushbhadra rivers. |
| Rahang | Rahang | Single Pargana. |
| Serai | Serai | -do- |
| Chaubiskud | Chaubiskud | -do- |
| Banchas | Banchas | -do- |

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To these have been added the miscellaneous items—Scattered estates.

The distribution of estates over blocks is as follows :—

| No. | Block. | No. of estates. | Area in acres (fractions omitted). |
|---|---|---|---|
| 1. | Kotdes .... .... | 39 | 1,23,300 |
| 2. | Kodhar .... .... | 14 | 25,900 |
| 3. | East Athaisi and Damarkhand .... | 26 | 39,000 |
| 4. | West Athaisi and Matkatpatna .... | 10 | 16,800 |
| 5. | Lembai .... .... | 7 | 53,100 |
| 6. | Kotrahang .... .... | 78 | 28,000 |
| 7. | Paschimduai .... .... | 109 | 12,500 |
| 8. | Purbaduai Oldhar .... | 87 | 31,700 |
| 9. | Rahang .... .... | 22 | 68,800 |
| 10. | Serai .... .... | 9 | 40,300 |
| 11. | Chaubiskud .... .... | 16 | 56,600 |
| 12. | Banchas .... .... | 41 | 12,700 |
| 13. | Scattered estates .... | 27 | 14,600 |
| | Total | 485 | 5,23,300 |

The average size of an estate is 1,079 acres. But the largest, Kotdes, has an area of 1,10,562 acres; and the smallest, Kharidagi Mahura, tauzi No. 487, an area of ·43 acres. Under the new settlement the classification of estates by revenue will be :—

| Rs. | Rs. | No. of estates. |
|---|---|---|
| 1 to | 10 .... | 46 |
| 10 to | 50 .... | 106 |
| 51 to | 100 .... | 78 |
| 100 to | 1,000 .... | 211 |
| 1,000 to | 5,000 .... | 37 |
| 5,000 to | 10,000 .... | 2 |
| 10,000 to | 1,00,000 .... | 4 |
| Over Rs. | 1,00,000 .... | 1 |

The variations in revenue will be from Rs. 1,04,324 ( Kotdes ) to Re. 1-2 a nd the average amount of revenue per estate Rs. 777.

**Division into Holdings and Plots.**

78. To ascertain the average sizes of a holding and of a plot two different sets of figures must be considered.

As the number of revenue-free holdings and plots cannot be separated out from the number of revenue-paying without an amount of trouble incommensurate with the object, the average size of a holding may be ascertained by dividing the total assessed area by the total number of holdings according to the Settlement reports, while the average size of a plot may be ascertained by dividing the total area of the temporarily-settled Parganas by the total area of plots according to Survey records. The figures so ascertained are—

| | | |
|---|---|---|
| Total assessed area | .... | 3,73,300 |
| Total number of holdings | .... | 2,04,400 |
| Average size of holdings | .... | 1·8 acre |

| Name of pargana. | Total area in acres | Total cultivated area in acres. | Total number of plots. | Average size of plot 3÷5. | Average size of plot 4÷5. |
|---|---|---|---|---|---|
| 1 Antrodh | 34,054 | 26,909 | 98,084 | 0·34 | 0·27 |
| 2.. Astrang | 5,743 | 2,839 | 7,625 | 0·75 | 0·37 |
| 3. Athaisi | 33,363 | 12,893 | 42,116 | 0·79 | 0·30 |
| 4. Banchas | 19,413 | 14,804 | 50,051 | 0·38 | 0·29 |
| 5. Chaubiskud | 64,207 | 37,471 | 90,236 | 0·71 | 0·41 |
| 6. Damarkhand | 18,876 | 13,012 | 38,450 | 0·49 | 0·33 |
| 7. Kanman Tappa | 4,163 | 2,335 | 7,354 | 0·56 | 0·31 |
| 8. Kodhar | 17,579 | 12,215 | 50,759 | 0·34 | 0·21 |
| 9. Kotdes | 116,325 | 92,504 | 404,724 | 0·29 | 0·22 |
| 10. Kotrahang | 35,460 | 29,246 | 120,601 | 0·29 | 0·24 |
| 11. Kurelo | 12,916 | 8,081 | 26,309 | 0·49 | 0.30 |
| 12. Lembai | 57,597 | 45,184 | 162,766 | 0.35 | 0·27 |
| 13. Matkatpatna | 6,709 | 2,382 | 7,453 | 0.90 | 0·31 |
| 14. Oldhar | 26,319 | 12,195 | 28,117 | 0·93 | 0·43 |
| 15. Paschimduai | 16,650 | 13,642 | 55,134 | 0·30 | 0·24 |
| 16. Purpaduai | 20,888 | 16,559 | 45,959 | 0.45 | 0.36 |
| 17. Rahang | 96,097 | 73,992 | 210,840 | 0·45 | 0.35 |
| 18. Serai | 43,091 | 32,526 | 75,313 | 0·57 | 0·43 |
| Total— | 6,29,550 | 4,48,789 | 15,21,891 | 0.41 | 0·29 |

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An alternative figure for size of plot has been given, the first inclusive and the second exclusive of the uncultivated area. The number of unclutivated plots is comparatively small, though the area is considerable. It would be difficult to separate out the number without elaborate examination of the records, and as it bears only a very small portion to the total number, its inclusion does much affect the value of the average.

It would appear from the above figures that the average holding comprises seven plots. The average being 351 acres in extent, will comprise on the average 92 holdings and 689 plots.

**General description of Physical Features.**

79. The sadar Subdivision of the Puri District is the south-western section of the Mahanadi delta. It is flanked on the west by the hill country of Khurda, a continuation of the low ranges which separate the Native States of Nayagarh, Khandpara, and Rampur from the valley of the Mahanadi. The boundary between the Sadar and Khurda Sub-division is a well-defned line running close to the foot of the hills and occupied by the Kawakhai and Daya channels. The valley of the Daya is crossed by the hills at two points only—at Dhaulagiri, an isolated peak standing in a detached village of Khurda in North Kotrahang below the bifurcation of the Daya and Bhargabi; and at Jagdalpur, where there is a line of low hills intersected by the new Puri Branch Railway. The highest peak in this range, rising behind the Jagdalpur bungalow and crowned by an ancient Hindu Tample, is about 500 feet above sea level. Dhaulagiri, famous for the *Asoka* inscription carved on a great slab of living rock near its base, is about the same height.

The Sadar Subdivision crosses the Daya at two places only—in North-west Lembai, where it encroaches on the Khurda uplands and encloses the small hills of Kanbagpara Anragarh; and again in West Serai, where it diverges from the river for a distance of 2 to 5 miles and encloses some high land and rocky mounds in Garh Sanput.

With these trifling exceptions, the Sadar Subdivision is alluvial deltaic country, stretching without break from the Eastern Ghâts to the Bay of Bengal.

The main portion of the delta is contained between the channels of the Daya on the west and of the Kushbhadra on the east. Beyond the Kushbhadra valley is a tract of high inferior land where cultivation is varied by stretches of moorland intersperesed with patches of forest and scrub jungle. This higher belt forms the watershed between the southern Cuttack and Puri section of the Mahanadi delta. It stretches from the head of the Sadar Subdivision in North Kotdes through parganas Antrodh, Damarkhand, Banchas, and the Kodhar block to the marshes of *Killa* Marichpur. The Katjuri through its chief offshoot the Devi finds an outlet to the sea in *killa* Marichpur through a network of creeks.

In the delta proper lying between the Daya and the Kushbhadra three more or less distinct areas may be distinguished. The Parganas at its hed—Kotdes, Kotrahang, and Lembai—are marked by considerable diversity of level. The higher lands are occupied by small patches of forest, by extensive mango, jack, and *palang* groves, and by village sites concealed from view in the foliage of *banyan*, tamarind, and other umbrageous trees. Rice lands of varied levels fill up the intervals. The whole combines to form a pleasing picture, and the eye is nowhere wearied by dull flat expanses of plain country stretching unbroken to the borizon.

As we proceed further south we come to the second zone of the delta. There is here less diversity of level. Woodland scenery is rarer. The village sites are more exposed, and clusters of cocoanut, palmyra, and date palms take the place of the more leafy groves of the north. The only breaks in the monotony of the landscape are caused by the large rivers whose banks are fringed with trees and undergrowth. Parganas Athaisi, Purbaduai, Oldhar, Paschimduai, Rahang, Chaubiskud and Serai lie within this second zone. In the southern extremities of these Parganas where we approach the third zone the aspect of the country is dreary beyond description. The land is flat as the surface of a table ; it is only a few feet above sea level, and is mostly subject to river flood which converts whole tracts by turn into inland seas or marshy swamps. The village sites are huddled on the top of isolated mounds, some provided by nature, others constructed or developed by art. The trees, if any, round the homesteads, are seldom more than a group of palms, so few that they can be counted on one's fingers.



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The last zone is the area lying beyond the line of cultivation. On the south-east it is a belt of sand along the sea-coast varying from 1 to 4 miles in breadth; on the south-west it is the great expanse of water called the Chilka Lake. Along the coast is a line of sand hills which the rivers of the delta find it difficult to pierce. The Kushbhadra on the east finds an obstructed outlet to the sea; but the Bhargabi, after flowing due south for nearly 50 miles, finds it can make no headway through the shore sand, throwing off some of its volume into the Sar Lake and the Samang Pat, two shallow lagoons to the east and north of Puri town, then turns abruptly to the west and makes its way to the Chilka.

**The Chilka Lake.**

80. The Chilka Lake occupies about one-fifth of the total area of the Sadar Subdivison. It is the great basin into which the rivers of the southern delta empty themselves. On the west it is flanked by the Khurda hills. On the east it is divided from the sea by a belt of sand and a group of low islands formed by silt deposit. A small opening of two or three hundred yards connects its waters with the sea and admits the tide. The lake is fresh in the rains and salt in the hot weather. The depth varies from a few inches to a few feet, and its area fluctuates with the season, with the intensity and duration of the annual river floods, and with the ebb and flow of the tide. The normal area of the portion included in the Puri District may be taken to be 310 square miles and the average depth about 4 feet. An ornate description of the lake and its scenery may be found on pages 22 to 25 of Sir W. W. Hunter's "statistical Account of Puri" and in volume I of the same author's "Orissa."

**The Soil.**

81. Save in the west, where the Sub-division encroaches on the laterite uplands of Khurda and on the south and east, where the shore sand forms a belt of varying width, the soil of the Subdivision is of the normal alluvial type found in deltaic country. There is every variety of admixture from almost pure sand to almost pure mud. Generally speaking, the lighter soils, the sandy loams, are most abundant in the north of the district, where there is much diversity of level. The black soils are found more widely in the lower levels of the southern Parganas.

There are several native classifications of soils, as viewed from different points of view. Perhaps the most general is the division into.—

***Pal*** land, the riverside silt-enriched soils on which miscellaneous crops of tobacco, sugarcane, *arhar*, *kulthi*, etc., are grown, and

***Jal*** land, the ordinary rice lands within the embankments.

In the *ruidad* of Pargana Rahang soils are divided into the following classes, which may be taken as typical :—

(1) ***Diha,*** homestead land (including the garden as well as the house site).

(2) ***Kala*** (black land) lying below the village site ; the land over which the washing water of the village is poured and all village refuse is thrown.

(3) *Gora* (light-coloured land), the ordinary crop land.

(4) ***Nadipatu*** (river clay), the land on the river bank enriched by alluvial deposit. (*cf.* ***Pal*** land above).

(5) ***Sarpatu*** (watery land), as for example in the ***dalua*** tracts of the Sar Lake and the Samang Pat.

There are numerous names again for the different varieties of ordinary crop land according to composition, colour and other peculiarities. I have found the following names in use :—

| | |
|---|---|
| *Balichar.*— | Pure sand out of cultivation. |
| *Balia* or *Baliara.*— | Sandy soil just fit for cultivation. |
| *Balia matal.*— | Sandy loam, the most common of all soils and varying much in composition and fertility. |
| *Goria matal.*— | Soil mixed with pebbles and small stones, usually high land recently reclaimed. |
| *Dudhia matal.*— | (milk coloured.—White soil, very friable and fairly fertile ; grows fine paddy. |
| *Telia matal.*— | A damp clay soil with an oily appearance ; fairly common and not unfertile. |
| *Sudh matal.*— | Purely muddy soil. |
| *Chaulia matal.*— | Brownish soil, very friable ; common and fairly fertile. |

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***Pansia matal.***— Ash-coloured soil, not uncommon and also fertile ; very friable.

*Kimbhiria matal.*— Slate (crocodile) coloured soil ; something like the preceding.

*Telia balia* — Intermediate between ***balia matal*** and ***telia matal.***

*Dhaulia matal.*— Greyish-white soil.
*Nalia matal.* — Red soil.
*Haldia matal.*— Yellow soil.
} Called from their colours, which are due to peculiarities of local origin; usually fertile.

*Janha matal.*— An inferior variety of ***chaulia matal***

*Hadua matal.*— Coloured like bone, and of hard consistency.

*Khulthi matal* or *Khari matal.*— A chalky soil ; fairly fertile.

*Chikta matal.*— Sticky, muddy soil ; often found in the bottom of tanks.

*Kala matal.*— Black soil, usually of low levels ; the most fertile of all (to be distinguished from ***kala mati***—the land round the village site).

*Nunia matal.* — A soil which from some peculiarity of composition becomes saltish in the hot weather. It abounds near the Chilka. The subsoil I suppose gets affected and the saline impregnation gradually pervades the upper soil and gives it a bluish-white apperance.

*Nunia.*— (called ***nuni char*** while out of cultivation), soil which has been inundated with salt water and has not recovered; may or may not be in cultivation. This is also common in the Chilka side villages.

**Fertility of soils.**

82. When village notes were compiled in camp, raiyats used to be asked to give estimates of the produce of different soils. These estimates were anything but correct, and always fell much short of the truth. They varied considerably from village to village. I give, for what it is worth, a table which shows for each class the number of times it is mentioned in the village notes and the average produce assigned by the raiyats.

| Class of soils. | | | Number of times mentioned. | Average produce in *gownies*=4·6 seer of 80 tolahs. |
|---|---|---|---|---|
| Balia or | Baliara | .... | 4 | 57 |
| Balia | Matal | .... | 74 | 95 |
| Goria | Do. | .... | 1 | 30 |
| Dudhia | Do. | .... | 7 | 83 |
| Telia | Do. | .... | 11 | 85 |
| Sudh | Do. | .... | 25 | 106 |
| Chaulia | Do. | .... | 53 | 95 |
| Pansia | Do. | .... | 12 | 100 |
| Kimbhiria | Do. | .... | 5 | 88 |
| Telia | Do. | .... | 5 | 70 |
| Dhaulia | Do. | .... | 5 | 110 |
| Nalia | Do. | .... | 9 | 132 |
| Haldia | Do. | .... | 4 | 115 |
| Janha | Do. | .... | 3 | 90 |
| Hadua | Do. | .... | 1 | 120 |
| Khalli | Do. | .... | 1 | 80 |
| Chikta | Do. | .... | 3 | 90 |
| Kala | Do. | .... | 19 | 161 |
| Nunia | Do. | .... | 15 | 66 |
| Nunia | Do. | .... | 5 | 80 |

The average for 262 entries comes to 98·7 *gownies*—454 standard seers. This is of course an understatement; an addition of 50 per cent. at least would be required to make the estimates an approach to truth.

**River System.**

83. The range of hills which separate the Native States and the District from the southern valley of the Mahanadi is pierced by that river at Naraj, a village 7 miles above Cuttack town and about 10 miles from the northern angle of the Sadar

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Subdivision of Puri. The Mahanadi, after emerging from the Naraj gorge, throws off to the south one of its chief affluents, the Katjuri, which in its main steam is the principal drainage channel of southern Cuttack. The Katjuri, opposite the town of Cuttack and only a mile or two below the point where it leaves the Mahanadi, is tapped by the Kawakhai which is the head stream of the Puri section of the delta. It has three main distributaries; at Balianta, about 12 miles from its head; it sends off the Kushbhadra to the left, and at Sadaipur 7 miles lower down, it divides into the Bhargabi continuing south, and the Daya inclining to the south-west. The most easterly of the three rivers, the Kushbhadra, makes its way by a more or less direct line to the sea and forces a sluggish passage through the shore sand about half way between Puri town and the mouth of the Debi river, under which name the parent stream the Katjuri finds an outlet into the Bay. The most westerly of the three distributaries, the Daya, follows more or less closely the base of the Khurda hills and enters the Chilka Lake at its north-east end. The Bhargabi, the central stream of the Puri delta, flows almost due south in the direction of Puri town, and finding itself checked by the shore sand, curves rapidly to the west and seeks the Chilka, into which it discharges itself by a network of channels, some of them linked with the Daya.

84. The remaining rivers of the District are either tributaries and affluents of the three main streams, or local drainage channels. Beginning from the east corner of the District the following names may be noted. *Killa* Marichpur is drained by the Debi and its offshoots the Gadokont, the Magranal and Kotai rivers. The Prachi carries down to the sea the drainage of the border country between the two districts. It is joined at its mouth by the Kadua, another local stream which flows midway between the Prachi and Kushbhadra basins. The Kadua and the Prachi enter the sea between the two Parganas Athaisi and Kurlo. The Kushbhadra receives no important contributions from the east; but, on the west at a point 6 miles from the sea, it receives the whole of the drainage to the Parganas lying between its own and the Bhargabi channels. The Dhanua, with its sub-tributary the Mugai, conveys this large addition of volume to the Kushbhadra, and the point of junction is said to be the lowest point in the delta. The distance of this point from the sea by a direct line is only 6 miles, but as the fall is very gradual, the river adopts a winding course and does not reach its destination till it has carried twice that distance. There is a constant struggle at the Kushbhadra mouth between the river current and the tide. The struggle has resulted in the formation of a sandy bar which effectively checks the river discharge in time of heavy flood.

North-eastern Rivers.

85. The Bhargabi, which is heavily embanked throughout, receives no tributaries of any note from the point of bifurcation at Sadaipur to its turning point north of Puri town. On the other hand it gives off some of its volume to the Sar Lake by the Bengai and Kanchi ***nalas***, and to the Samang ***Pat*** north of Puri by the Dhauria, East Kania, and Athara ***nalas***. The excess spill water of these escape basins is carried by the Harichandan of Suna Mahi river through the sand in a line parallel to the sea front for a distance of nearly 20 miles, when it enters the Chilka near the Chilka mouth. About 10 miles from Puri this channel was joined by a small stream from the north called the "Naya nadi" or "Mew". This small stream was, some forty years ago, artificially connected with the main stream of the Bhargabi, and now as the "Naya nadi" is one of the escape channels of the great river. The Bhargabi after turning to the west thus gives off two affluents to the south-east, viz., the East Kania and the "Naya nadi". The rest of its progress is westward and north-westward towards the Chilka. It sends one offshoot, the South Kania, due west to the Chilka. The main stream then turns north and receives the Rathanchira, a tributary which conveys to it the drainage of the south-eastern half of the country between the Bhargabi and the Daya. Its course is again deflected west, and a network of channels carry its waters to the Chilka at the very point where the Daya enters the lake. The country between the two rivers Bhargabi and Daya has two chief drainage channels, the Rathanchira on the south and east, and the Nun on the north and west. The Rathanchira as remarked above joins the Bhargabi. The main stream of the Nun enters the Daya a few miles above its mouth, but it has

Southern Rivers.

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numerous independent creeks connecting it direct with the Chilka. On its left bank the Daya receives several hill streams running down from the uplands of Khurda. The chief of these is the Gangua on the north and the Madagui on the south. The Gungua enters about the 10th mile, and the Madagui about the 28th.

Distribution of Puri rivers.

86. All the rivers of the Distsict have one characteristic in common. In the hot weather they are beds of sand with tiny streams or none at all, while in the rains they receive more water than they can carry. This is only the common experience of an Indian river. The particular evils that result in the Puri District will be discussed in a subsequent section of the report.

In Mr. Taylor's report of 1871 on the Orissa Embankments are two statements that show at a glance the distribution of the deltaic rivers, and of the local drainages in the District; and though prepared nearly thirty years ago they give an accurate description of the present order of things.

Embankments.

87. The rivers of the District have from time immemorial been restrained within embankments, and the cultivated lands have been in a more or less efficient degree protected from the disastrous effects of inundation. Before attempting to draw parallels with former times, I will endeavour to give a brief description of the embankments as they exist at present. They are shown on map No. V to understand which it is necessary to know the recognised distribution under the following four classes :—

Class I.— Canal embankments which are intended to be above high flood level marked 0000. ( There are none of these in the Puri District ).

Class II.— Agricultural embankments mostly above present high flood level which will probably be permanently maintained at their present height; marked -o-o-o-o.

Class III.—Embankments which eventually it will probably be desirable to abandon, but which it is proposed to retain for the present; marked □—□—□—□

Class IV.— Embankments which it is undersirable to retain, as in some cases they are actually harmful and the reminder are of doubtful utility; marked * * * *

Zamindari and abandoned Government embankments used to be shown in the maps by a zig-zag line thus ⟋⟍⟋⟍⟋ and classed V, but they have, by recent orders, been expunged from our records and need not be referred to.

It will be seen from the map that only the three principal rivers into which the Kawakhai breaks up, viz., the Daya, the Bhargabi, and the Kushbhadra, are embanked. The Kawakhai has on its right bank a Class IV embankment which is continued for a few miles along the Daya. The embankment is not in good repair and no serious attempt is made to maintain it. For the rest of its course on the right bank the Daya is devoid of embankments. The Kawakhai on its left bank is defended by a Class II embankment up to Balianta, where the Kushbhadra takes off, and by the Pilgrim road which acts as a Class II embankment from Balianta to Sadaipur where the second bifurcation occurs. The Daya left has a Class II embankment from the point of bifurcation to within a few miles of the Chilka. The Bhargabi is defended on its right bank by a Class II embankment continuous from its parting with the Daya to a point a few miles from the Chilka. On the left the embankment is of Class III. Its line is first broken by the unrepaired Adlalad breech in the 6th miles. From Gabkand to the opening of the Kanchi river the embankment is of Class IV. Then follows a series of escape channels and openings near the westward curve of the Bhargabi. Three tracts of country enclosed by these escapes are protected by ring embankments of Class III. The largest is surrounded by the Bhargabi, the East Kania, the "Naya nadi" and the Harchandi river, forming an oblong about 15 square miles in extent. The rest of the left bank of the Bhargabi and its affluent the South Kania is embanked by Class III *bunds* to within a few miles of the Chilka. The last few miles both on the Daya and the Bhargabi are left open because in flood time there is always a heavy backwater from the Chilka, and embankments are useless.



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Class IV, and a small stretch of Class III, embankments are shown along the north shore of the Sar Lake and the coure of the Bengai river, but they have not been repaired for several years, and under present conditions are useless for the protection of the country lying to the north and east.

The Kushbhadra has a Class II embankment for 6 miles down the right bank, and Class IV embankment not repaired and not continuous for 12 miles down the left bank.

It has been stated in a previous paragraph of the report that the Debi river, an affluent of the Katjuri, enters the District in the extreme north-west corner. There is a short length of combined Class IV and Class III embankment along the right bank at the place where it skirts Kodhar Pargana. This is breached in many places, and it has been proposed, if not already decided, to leave it in disrepair.

From the above it will be seen that the present policy of Government is to effectively protect the large central tract lying between the Daya and Kushbhadra channels, and to leave the rest of the District to take its chance. The tract to the west of the Daya and to the east the Kushbhadra are practically unprotected. The mid tract between the Kushbhadra and the Bhargabi is one only partially protected in the northern half. In the southern half it is exposed to the mercy of the annual floods.

A list of the existing Class II, III, IV and of the abandoned Class V, embankments taken from the records of the Public Works Department forms Appendix G to this report. From this it will be seen that the distribution by classes is as follows :—

| Class | | Miles. | Feet. | |
|---|---|---|---|---|
| II | .... | 97 | 1,336 | To be retained permanently. |
| III | .... | 113 | 3,494 | To be retained temporarily. |
| IV | .... | 46 | 1,790 | Probably to be abandoned. |
| V | .... | 62 | 1,405 | Already abandoned. |

The total length of the existing embankments (Class V exclused) is 257 miles 1,250 feet.

As it was only a few years ago that the present policy of abandoning embankments supposed to be useless or injurious was inaugurated, it would have been interesting to contrast the average cost of maintenance before and after, but I have not been able to get the figures necessary for comparision.

In 1896-97 it appears that 257 miles 1,340 feet of Puri embankments were maintained at a cost of Rs. 35,792 or Rs. 139 per square mile as against an average cost of Rs. 247 per mile in Cuttack and Rs. 182 per mile at Balasore. (See Government Resolution No. 209 I. D., dated the 18th February, 1898).

With this we may compare the statements found in the statistical account of Puri that the total length of embankments in 1866 was 316¾ miles with 43 sluices, maintained at an annual cost of £7 16, or Rs. 156 per mile; that is, at a total cost of Rs. 49,413.

The figures of a single year taken at random do not however convey much information. In 1896 there were heavy breaches, which swelled the bill of costs.

It has not yet been decided definitely what will be the ultimate fate of the embankments of Class IV. From the revenue point of view, I do not think that it would be judicious to abandon those on the Kushbhadra left, on the Bhargabi left, on the Bengai and on the Sar Lake. But the embankments on the Bengai, the Bhargabi left, and the Sar are more or less useless if the Adlabad Gap remains open. If then it is decided to leave the Adlabad Gap in ***statu quo***, there is not much to be gained by maintaining the others.

**Effects of Floods on Embankments.**

88. The volume of water poured into the Puri District by the Kawakhai Channel varies enormously from year to year. The carrying capacity of the embanked channels that conduct this water to the Chilka and the sea varies also with the distance from the head of the delta. To properly appreciate the condition of the problem we want to know first what is the estimated discharge from the Katjuri into the Kawakhai in years of high flood. We then want to know the carrying capacity of the distributaries of the Kawakhai at various distance from the head of



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the system. Distances of 25 and 40 or 50 miles would supply data from which could be estimated the effect of floods on the upper and lower sections of the District, respectively. The Superintending Engineer of the Orissa Circle has kindly given me some notes from which it appears that the estimated discharge of the Kawakhai at head in the exceptionally high flood of 1842 was computed to be 334,483 cubic feet per second, and that the high flood discharge may in future be estimated at 277,180 cubic feet per second.

In a report made by Major Harris in 1858 the discharge capacities of the Kawakhai distributaries at a point 25 miles from Cuttack were estimated as follows :—

| | | Cubic feet per second. |
|---|---|---|
| Daya | .... | 33,100 |
| Bhargabi | .... | 59,220 |
| Kushbhadra | .... | 9,853 |
| Total | .... | 102,173 |

After the flood of 1872 it was estimated that in their lower reaches these rivers could only discharge 45,000 cubic feet per second. It is evident, then that even in a year of very ordinary flood when the discharge is, let us say, only half of the high flood discharge, the Puri rivers are unable to contain within their banks the volume of water passed into the District through the Kawakhai even within the first 25 miles; there must be a discharge of the excess. Under present conditions the spill in ordinary years occurs over the right bank of the Daya, through the Adlabad breach in the Bhargabi left, and over both banks of the Kushbhadra about 20 miles below Cuttack. The relief thus afforded prevents breaching of the embankments lower down.

As regards the phenomena to be witnessed in exceptional years we have ample evidence in the flood reports of 1892 and 1896.

The flood of 1892 was remarkable for its intensity, and that of 1896 for its duration. In 1892 the most serious breaches that occurred in the important embankments of the Daya, Bhargabi, and Kushbhadra were the following :—

*On the daya Left* (Class II) at Madhepur in the 8th mile.

*On the Bhargabi Right* (Class II) none serious. *Left* (Class III)., at Adlabad in the 6th mile; Gabkand in the 23rd mile.

*On the Kushbhadra Left* (Class II) at Jogisahi in the 1st mile.

These breaches occurred at places that are always weak points in the embankments. The breaches in the Daya left are caused by the return to that river of the great volume of water escaping across the Class IV embankments of the Kawakhai and Daya right bank. The flood water takes the direction of the Gangua ***Nala*** and returning to the river at a point where the channel is contracted, impinges on the left embankment almost at right angles. After breaching the embankment and the Puri-Khurda Road, the water makes its way across Lembai Pargana. Some of its volume returns to the Daya south of the Jagdalpur hills and again imperils the embankment. The rest seeks the Chilka through the channel of Nu'n river. The left embankment of the Daya has not only to withstand the volume of this returning flood water; it is also endangered by the flood poured against it by the Mandagine, a tributary which in addition to its own volume receives by a sub-tributary called the Rajna much of the flood that has spread over the west Daya tract. Breaches in the lower left embankment of the Daya are thus inevitable in years of heavy floods.

The Bhargabi right (Class II) is the most efficient of the district embankments, probably because on account of the breaching of the opposite bank and the relief so afforded to the river it gets less work to do than any other. It rarely gives way, save in the lowest reaches of the river near the Chilka, where breaches have no serious results and flooding is inevitble.

The Bhargabi left (Class III) is the most troublesome of the embankments. Breaches have occurred so frequently at Adlabad in the 6th mile that since 1895 it has been decided to leave the gap open. The serious results that flow from this policy have been described in detail in the special report on Purbaduai, Oldhar Parganas, and it is hoped that the question will receive reconsideration in the right of its relation to land revenue. The next weakest point is at Gabkand. No breach

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occurred here in 1896 because of the relief afforded by the Adlabad gap. The embankment from Gabkand to the head of the Kanchi outlet is shown in the maps as Class IV. I have not seen this portion of the embankment, but hope that it is not proposed to abandon it and intensify the misfortunes of the flood-afflicted Parganas to the east. The relief afforded to the river by the Adladad breach and the escape channels near Puri is such that no breaches occurred in the lower embankment during floods of 1896.

The Kushbhadra left embankment (Class II) is so aligned that breaches are inevitable in years of high flood. The embankments are funnel-shaped from the head of the stream downwards, and the contraction of the flood water volume can have no result but one. It is suggested by the Superintending Engineer in the report of 1896 that a gap be left at the point of breach. This, in my opinion, would be fatal to the prosperity of Kotdes, one of the richest Parganas of the District, accounting for over one-fourth of its total revenue. It cannot be argued that because an embankment is bound to give way in exceptional years, it should not be maintained in ordinary years when its beneficial effects are inestimable. Raiyats will cultivate their lands and pay their rents if they know that they will be protected in ordinary years. They are resigned to the misfortunes of exceptional years, but they cannot be expected to face cheerfully a certainty of calamity.

**State of Embankments in 1896.**

89. To complete the account of the effects of floods on embankments I make no apology for quoting Mr. Inglis' (Superintending Engineer's note of January 27th, 1897, which sums up the existing situation and is to some extent a declaration of policy:—

"8. ***Kawakhai Branch.***— The Kawakhai banch leaves the Katjuri on the right bank just below the Ganjam road, and flows though the Puri district. The chief peculiarity of this branch is that it has no large channel leading directly to the sea. The greater part of the water carried by it has to pass to the sea through the Chilka Lake. The channels by which the water is conveyed to the Chilka can in their lower portions carry only about 45,000 cubic feet per second, as compared with 324,483, the estimated discharge of the Kawakhai near its head in the flood of 1872. It is, therefore, obvious that whenever there is a high flood, a considerable part of the Puri district must become a lake for time being".

"The flood entering the Kawakhai is first guaged at Kajipatna. The reading here on 25th July was 81·68 as compared wiht 82,63 of 1892. Roughly, about three-fifths of the total discharge of the Kawakhai flows into it directly from the Katjuri main stream, and about two-fifths come into it a little lower down across the Ganjam road from the spill over the right bank of the Katjuri. The next guage is at Balianta, 14 miles below. At this place, the Kushbhadra branch leaves on the left bank. The highest reading of the year here was 71·35, that of 1892 having been 73·05. The Kawakhai in this length is embanked throughout on the left bank. There was a small breach in the 10th mile which caused no damage and which was soon closed. On the right bank the Kawakhai is not embked for some distance from its head; lower down there is a more or less continuous marginal embankment, but it is not of much importance, and it is among those which have been scheduled in Class IV. This was overtopped and breached in several places. The Kawakhai continues beyond Balianta for 7 miles as one stream. It then, in Sadaipur, splits up into the Daya, which is the larger stream on the right, and the Bhargabi on the left. This was not breached or overtopped, but some injury was caused by erosion. The highest reading of the gauge at Sadaipur was 53·67 as compared with 55·67 in 1892".

"9. ***Daya Branch***:—The Daya branch, commencing at Sadaipur, continues as one stream until it reaches the Chilka Lake. It has a continuous embankment on the left bank which is able to stand a moderate flood such as that of 1895, but is bound to be overtopped and breached in a high flood such as that of the present year".

"10. ***Kanti Breach***:—The first breach occurred in the 11th mile. It is 960 feet in length and the scour at the deepest part went down to 34 feet below the crest of the embankment. The gap will be closed either in the former line of bank, or by a ring bund, as may be found more economical. Breaches occurred here in 1872 and 1892 and as the flood way of the river narrows owing to high ground on the right bank just below this place, a breach here is inevitable in very high floods. It does not appear to be within the bounds of practicability, nor, if it were, would it,

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in my opinion, be desirable to raise the left embankment to such a height that it may pass all floods without breaching. This being so, there would appear to be only two alternatives-the one to leave things as they are, making good breaches when they occur; the other to construct at suitable sites on the left bank, escapes or overflow weirs, which would give the required relief to the river. The water from this breach passed off along the course of the Nuna river. It is reported to have caused damage to the Khurda-Pipli road, to have breached the newly-constructed railway embankment close to the bridge over the Nuna river, and to have brought down many huts in the villages.

"11. The next breach occurred in the 18th mile. It is 340 feet long and 16 feet deep from crest of embankment. This is said not to have caused much damage. The water passed off down the Nuna river.

"The third breach took place some days after the first two in the 28th mile, and did not cause much damage as the country had already been flooded by the water from the first breach. It was 300 feet long and 16 feet deep".

"In addition to the above breaches, some damage was caused at several places by erosion, which will have to be made good either by slope cutting with stone pitching or by retired lines of embankment.

"12. At the Kanti gauge, which is 11 miles below Sadaipur and just below the first breach described above, the highest reading of the flood of this year was 37·95 as compared with 37·35 in 1892. In the latter year there were, however, in addition to a breach of 930 feet at the same place as the breach of this year, two other breaches above in the left banks aggregating 700 feet in length.

In this case, as in all others where the gauges are situated below the points at which the embankments breach, the readings are in themselves no criterion of the magnitude of the flood. They are useful as indicating the volume of water passing at a particular point in a particular flood. The right bank of the Daya is now, except for a few miles near the head, open to flood throughout.

"13. *Bhargabi Breach.*—We may now return to Sadaipur and consider the Bhargabi branch. This runs as one stream for 29 miles when, near the point where it is crossed by the Puri road, it throws off on the left bank the Kanchi branch. Further on it throws off also on the left bank the East Kania, the Naya nadi and the South Kania branches, and what is left of the Bhargabi finds its may to the Chilka lake in conjunction with the Daya.

"When I say that the Bhargabi flows as one stream up to the point where the Kanchi takes, I refer rather to past than to present condition. For several years in succession, a breach occurred at Adlabad in the 7th mile of the Bhargabi on the left bank; it was decided last year to leave the breach open. About half the discharge of the Bhargabi passes out through this gap, and will take the course of the Dhanua river, which lower down joins the Kushbhadra. Part of the combined discharge passes directly into the sea through a channel much obstructed by sand, and the reminder has to pass through the Sar Lake and on past Puri parallel with the coast, till it finds an exit through the sand ridges to the sea. With the exception of this gap the water in the Bhargabi was within its banks ( natural and artificial ) till near its end, where, owing to the water escaping from the breaches in the left bank of the Daya river overtopping the banks, it joined in the general inundation.

"*14. Kushbhadra Breach.*—As has been mentioned above, the Kushbhadra branch takes off from the Kawakhai at Balianta. This channel is now embanked for a few miles at its head, only the embankments lower down having been abandoned as useless.

"The present declared policy is to maintain the embankment on the right bank for a little over 6 miles, and on the left bank only for about half a mile, where it protects a village. As was mentioned in the report on the flood of 1895, there is a weak place in the right embankment closed to the head, where a breach has occurred for several years in succession. This breach was closed by a strong bank in the early part of this year and would probably have stood an ordinary flood. The unusually high flood of this year rose to the crest of the old embankment and broke through a short distance above the new bank. This breach quickly spread and the whole of the old gap was opened out again. It seems a little doubtful whether we should not accept the situation and allow for an escape here. The water escaping



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at this place joins that from the Adlabad breach on the Bhargabi and takes the course of the Dhanua river to the Sar Lake. In the meantime the gap will be closed by a strong bank, which is likely to be effective for some years at all events".

State of the District during flood.

90. The notes that have been given in the preceding section refer chiefly to the effects of flood on embankments and take little note of the effects on the country at large. To Mr. Inglis' report is attached a map which shows roughly the area affected by floods and the areas free from flood and is reproduced as map No. I appended to this report. The area which is coloured blue represents the area which was submerged in 1896. The portion of the blue which is shaded with lines represents the area which under present conditions is liable to inundation in years of ordinary flood. The facts may be put briefly thus. In ordinary years the tracts liable to inundation are—

(1) The West Daya tract, including West Lembai, West Serai and Balbhadrapur ( of Khurda Subdivision ); results serious.

(2) The Dhanua basin, including the greater portion of Parganas Purbaduai, Oldhar, Matkatpatna and a small portion of Kotdes and Rahang Parganas; results serious.

(3) The Samang ***Pat***, north of Puri, suited for ***dalua*** cultivation. The inundation is a necessity, not an evil.

(4) The lower reaches of the Kadua and Prachi rivers; damage slight.

(5) Portions of Parganas, Kodhar, Kurelo, Tapa Kanman. This is due to the inefficient state of the Khas Mahal and Public Works Department embankments on the south bank of the Debi.

The effects of inundation are most disastrous in tract (2), where the water lodges for a longer period than elsewhere on an account of the inability of the Kushbhadra to discharge its volume quickly. It is also by far the largest of the tracts, and the annual loss of Government revenue, if the existing policy, is continued, cannot be estimated at less than Rs. 4,000. The loss of zamindars and raiyats is many times that amount, but cannot be gauged and reduced to figures.

In years of extraordinary flood the only portions of the District not liable to inundation are —

(1) Kotrahang.
(2) Paschimduai
(3) East Rahang.
(4) South-East Chaubiskud.

The whole of the rest of the District is converted into a lake for the time being. The effects are least disastrous in the northern Parganas where the ground fall is sufficient to carry off flood water before irremediable damage has been done. Kotdes, Lembai, Antrodh, Damarkhand and Banchas may be placed in this category. The Parganas further south are liable to suffer very heavy loss of crops. The loss in bad years is unusually total in those Parganas which even in ordinary years are subject to flood.

The problem of protecting the District from river inundation is a difficult one. It cannot, I think, be said that the present situation is very satisfactory, and it will not I believe be accepted as final. The problem is to conduct a given amount of water from the head of the district to the Chilka and the sea by channels that reduce to a minimum the chance of danger to the cultivated area.

In ordinary years the embanked channels of the Kawakhai distributaries are equal to the task. In extraordinary years they are unequal to it. The object to be aimed at is to conduct the excess water in directions by which it will do least harm. At present it is allowed to spill into low-lying areas, where the results are most harmful, while on the other hand complaints are made that where flood water is wanted on the shores of the Chilka to neutralise the salt impregnations of the hot-weather tides, a sufficient supply of river water is not now obtainable.

I make the above remarks with all due deference to the opinion of experts, as the problem is surrounded with professional difficulties which I have not the technical knowledge to estimate. It is further complicated by the claims of other tracts and by the want of funds. My chief object is to draw attention to the extent of the damage that is caused in certain areas by the present arrangement.

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A careful perusal of the Departmental Reports of recent years leads me to think that the damage in these areas has not been fully realised and considered.

Salt floods.

91. A word should be added about the liability of certain tracts to salt inundation. All the rivers of the District, whether they enter the Chilka or the sea, run dry in the hot weather and are then liable to have salt water forced up their channels by the action of the tides and the strong breeze which blows from the south for several months of the year. When the rivers are embanked and the tides high and the breeze strong, the salt water overflows and does much damage to the cultivated fields. The tracts specially liable to this misfortune are a belt of about 5 miles round the shore of the Chilka in Parganas Chaubiskud and Serai and the lands situated on the lower reaches of the Kushbhadra, the Prachi, the Kadua and the tidal creeks of the Kodhar block.

Fields deeply submerged do not recover fertility for a period of three or four years. The crops are therefore precarious in tracts liable to this visitation. For such areas river inundation is highly beneficial. The saline impregnations get washed out of the soil by river flood, and the effects of tidal flood are counteracted. But for this happy contingency many large stretches of country would doubtless lie west along the Chilka shore. There have always existed salt embankments in a more or less fragmentary condition. An attempt was made in 1896 to improve these *bunds*, but the work was not completed. The subject has been fully discussed in the Khas Mahal reports of Serai and Chaubiskud Parganas, and I understand that an effort will be made in the cold weather of 1898-99 to complete the line of empankments. (Written in July, 1898).

Embankments and liability to inundation at last Settlement.

92. Mr. Taylor's embankment report of 1871 supplies a mass of interesting information regarding embankments as they existed then and as they were shortly after the last Settlement. His report embodies the results of enquiries made at the suggestion of the Embankment Committee which sat after the great famine of 1866-67. The object of the enquiry was to ascertain what obligations had been imposed on Government by the Settlement of 1837 as regards the up-keep of embankments, and to report how these obligations were being fulfilled. Mr. Taylor found as regards Puri that Government had now here covenanted to either construct embankments or to maintain them in repair, but he states that as a matter of fact "it has always been the custom for the Government to construct and keep up any embankment that might be required."

All the existing embankments were elaborately measured, described and detailed and suggestions were made for their improvement. It does not appear that save in the matter of the Adlabad breach, the embankments of 1870-71 were in a better or worse condition that at present. The Daya right had practically been abandoned; the Daya left, the Bhargabi right and left were maintained in good repair. The Kushbhadra right for about 13 miles was in good condition and the left was in great disrepair. The embankments on the smaller streams, some described as Government and some as zamindari embankments, were all in a state of great neglect; the Chilka embankments were in a condition almost exactly analogous to that of the present year.

Mr. Taylor gives some interesting extracts from a report made on the Puri embankments in 1858 by Captain Short, Superintendent of Bengal Embankments (pages 73-76). The Parganawar statements prepared by Captain Short show that the condition of the District in his times was worse than it is at the present day. It is curious to note that in discussing the case of Pargana Kotdes he uses the words—

**"Before such large volumes of water found their way down the Kawakhai (via the Katjuri river), this Pargana could be irrigated and drained at pleasure, but of late years it has suffered in the extreme from the floods breaking the embankments and topping the Puri road, but when the equilibrium is restored at the head of the delta and a supply of water given commensurate with the channel the prosperity of this tract will be restored."**

This indicates that a few years before the words were written (probably before the great flood of 1855) the volume of water carried through the Puri District was much less than it was in 1858 and than it is now. Both in 1858 and later in 1871 there was under consideration a plan of erecting a weir across the the head of the Kawakhai to regulate the Puri water-supply.

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The cost was estimated in 1871 at one lakh of rupees, equal to two years' cost of the annual repairs which then amounted to Rs. 50,000. The project has long ago been abandoned.

From Captain Short's statement it may be gathered that the Kodhar embankments were much neglected, and the country seriously liable to inundation.

*Kotdes* suffered from breaches in the Kawakhai and Kushbhadra embankments.

*Paschimudai* was suffering from breaches in the Bhargabi embankments.

*Purbaduai* was two-thirds lying waste, and of *Oldhar* only one-seventh was cultivated on account of the disrepair of the Bhargabi, Sar Lake, Bengai and Dhanua embankments. (The condition of these two Parganas was worse if possible than at present).

*Rahang* was liable to serious inundation, and the only remedy suggested was the regulation of the Kawakhai discharge.

*Kotrahang* had suffered serious damage of late years and there could be no remedy save that suggested in Rahang.

*Lembai* was in the like condition to Kotrahang and Rahang.

*Serai and Chaubiskud* were very unfavourably placed on account of the absence of salt embankments.

*Astrang* .... } *Kanman* .... } *Damarkhand* .... } *Banchas* .... } *Matkatpatna* .... } *Antrodh* .... } Were beyond the influence of the embanked rivers but not protected from the local streams, and various improvements were suggested. Compared with the above, present conditions show considerable advance and improvement. From the hopeless way in which Captain Short speaks of any policy other than that of regulating the supply at the head of the delta, it would appear either that the volume of water passed by the Kawakhai is now less than it was in 1858 or that the plan suggested was of his own devising and was commended to the exclusion of others. Whether it is a solution applicable to the present situation, it is for others to say; my intention in examining these old records was merely to ascertain whether zamindars and raiyats have any grounds for making the suggestion that in the earlier years of Settlement revenue and rents pressed less heavily than now, because of the greater efficiency of the embankments. Whatever may have been the position prior to 1855 it would seem that at least since that year the reverse has been the case, and that with the exception of the single tract affected by the Adlabad breach, zamindars and raiyats are much better off now than they were thirty or forty years ago.

**Rainfall and Temperature.**

93. There are three stations for the registration of rainfall in the Sadar Sub-division, viz, Pipli, Puri, and Gope.

The following table shows the distribution of the rainfall month by month at the three registering stations, (1) normal, (2) for 1897:—

| Name of Mont | Puri. | | Pipli. | | Gope. | | Average. | |
|---|---|---|---|---|---|---|---|---|
| | Normal. | 1897. | Normal. | 1897. | Normal. | 1897. | Normal. | 1897 |
| January .... | ·28 | .... | 0·33 | Nil | 0·25 | Nil | 0·28 | Nil |
| February .... | 0·78 | 4·25 | 0·38 | ·30 | 0·51 | 1·07 | 0·55 | 1·87 |
| March .... | 0·61 | 2·55 | 0·82 | 4·78 | 0·62 | 3·43 | 0·68 | 3·58 |
| April .... | 0·45 | 0·08 | 0·20 | Nil | 0·11 | 0·22 | 0·25 | 0·10 |
| May .... | 3·02 | 1·40 | 3·56 | 0·96 | 4·40 | Nil | 3·66 | 0·78 |
| June .... | 8·06 | 5·12 | 8·17 | 4·35 | 7·81 | 4·05 | 79·6 | 4·50 |
| July .... | 9·80 | 19·91 | 10·92 | 14·06 | 10·53 | 18·35 | 10·41 | 17·44 |
| August .... | 10·38 | 9·57 | 13·58 | 8.61 | 12·06 | 6·83 | 12·20 | 8·33 |
| September .... | 10·36 | 6·59 | 10·59 | 4·54 | 11·65 | 4·62 | 10·86 | 5·25 |
| October .... | 8·90 | 8·17 | 5·60 | 8·38 | 6.92 | 9·94 | 7·14 | 8·83 |
| November .... | 3.48 | 7·58 | 2·05 | 2·03 | 5.08 | 4·11 | 5·53 | 4·57 |
| December .... | 0·80 | 0·14 | 0·22 | 0·29 | 0·24 | 0·08 | 0·32 | ·17 |
| Total .... | 56·92 | 65·36 | 56·42 | 48·30 | 60·18 | 52·70 | 57·84 | 55·42 |

It will be seen that in normal years the variations are very slight between one station and another. This is as one would expect in a flat country where the interval from one station to another does not exceed 25 miles. In 1897 there

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was excess rain at Puri and a slight defect at Pipli and Gope, but the rain was well distributed and a bumper harvest all over the District was the result, In 1896 the rainfall was heavier than normal, but there was practically nothing after August. The heavy rains of June and August caused floods which injured the crops, and the subsequent drought completed their ruin.

Temperature.

Puri Town is situated on the shore of the Bay of Bengal and its temperature is equable all the year round. It rarely falls below 70° or rises above 90°. In the hot weather a strong fresh sea breeze blows up from the south and renders a temporary stay there an agreeable change from the accustomed heat of the plains. Puri cannot yet be styled a hot-weather resort or a favourite watering-place of Bengal. It has been, till lately, too much out off from the world to be of much importance, but it is now connected with the East Coast Railway by a branch line, and already there are indications that Puri will be sought after in the hot weather. When railway communication with Calcutta has been established we may xpect it to become a place of pilgrimage to seekers after health as well as to devuote Hindus.

Puri Town is situated in the South of the district, while Cuttack is only 7 miles from the northern extremity. The temperature of the district generally may be supposed to lie between that recorded at Cuttack and that recorded at Puri. I give in tabular form a note about the temperature of 1897 for which I am indebted to Meteorological Reporter of Bengal:—

| MONTH. | PURI. | | | Variation between Puri and Cuttack. | | |
|---|---|---|---|---|---|---|
| | Maximum. | Mean. | Minimum. | Maximum. | Mean. | Minimum. |
| January .... | 82·3 | 73·8 | 65·1 | - 4·7 | - 1·3 | +1·9 |
| February .... | 85·7 | 79·8 | 73·8 | - 6·5 | - 1·5 | +3·5 |
| March .... | 87·2 | 81·9 | 76·6 | - 8·9 | - 3·0 | +3·0 |
| April .... | 90·7 | 85·1 | 79·5 | - 9·2 | - 3·6 | +2·1 |
| May .... | 91·0 | 86·0 | 81·0 | - 10·8 | - 6·2 | +1·5 |
| June .... | 89·9 | 85·6 | 81·0 | - 8·1 | - 4·1 | - 0·3 |
| July .... | 88·5 | 83·9 | 79·4 | - 3·1 | - 1·6 | +0·1 |
| August .... | 87·6 | 83·4 | 79·2 | - 0·3 | +0·4 | +1·0 |
| September .... | 89·5 | 84·8 | 80·1 | + 1·6 | +1·8 | +1·9 |
| October .... | 88·8 | 82·8 | 76·7 | + 0·7 | +1·3 | +1·9 |
| November .... | 83·5 | 76·1 | 68·7 | + 0·2 | + 1·1 | +2·0 |
| December .... | 79·6 | 69·9 | 60·2 | + 0·5 | +1·7 | +2·9 |
| Average .... | 87·0 | 81·1 | 75·1 | - 4 | - 1·2 | +1·5 |

It will be seen that it is only in the daytime and for six months of the year that Puri has an advantage over Cuttack. During the months of August to October residence in Puri is very trying. The temperature is high, the atmosphere laden with moisture and the breeze which blows strong in the hot wheather, is absent. It is curious that, taking the whole year round, Puri should have a maximum average 4 degrees below Cuttack, and a minimum average 1½ degrees above Cuttack. This alone shows within how narrow limits the Puri temperature ranges.

Climate.

94. The climate of the sadar subdivision is generally salubrious; save in certain swampy tracts of the Chilka, it is free from malaria.

Perhaps the Subdivision can be divided climatically into four tracts—the northern Parganas, free from water-logging in the rains, are the healthiest; the flooded Parganas of the south are often submerged for over a month, and cannot but be unhealthy when the water is draining off and drying up; the coast belt, though always cool is often unpleasantly moist and is apt to be enervating after long residence; the Chilka belt is damp in the rains and the atmosphere is disagreeably saline in the hot weather. On the whole there is not much to complain of; I may add the testimony of personal experience by saying that I have been in the District



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for the better part of the last six years and have been to every nook and corner of it without contracting illness of any form.

**Extent of cultivation.**

95. The total area of the temporarily-settled Parganas, excluding detached lands of *killa* khurda, is 651,300 acres. Of this 463,800 acres are cultivated, 33,600 acres are culturable, and 153,900 acres are unculturable. A copy of the *milan khasra* statements by Thanas is given in Appendix E. As, from a Collector's point of view, the Pargana statements have most interest, I extract from them the following statements which show for each Pargana in Puri the proportional percentage of cultivated, culturable and unculturable land :—

| Name of Pagrgana. | Percentage of cultivated to total area. | Percentage of culturable but not cultivated. | Percentage of unculturable. |
|---|---|---|---|
| 1. Antrodh .... | 79· | 7·7 | 13·2 |
| 2. Astrang .... | 49·4 | 23·8 | 26·8 |
| 3. Banchas .... | 76·2 | 6·8 | 17· |
| 4. Chaubiskud .... | 58·24 | 5·57 | 36·29 |
| 5. Damarkhand .... | 68·9 | 14·9 | 16·2 |
| 6. Kodhar .... | 69·4 | 8·8 | 21·8 |
| 7. Kotdes .... | 79·4 | 2·1 | 18·5 |
| 8. Kotrahang .... | 82·3 | 2·5 | 15·5 |
| 9. Kurelo .... | 62·5 | 15·5 | 22· |
| 10. Lembai .... | 78·3 | 4·1 | 17·6 |
| 11. Matkatpatna .... | 35·5 | 6·3 | 58·2 |
| 12. Oldhar .... | 46·3 | 3·7 | 50· |
| 13. Paschimduai .... | 82·5 | 2· | 15·5 |
| 14. Purbaduai .... | 79·2 | 5·4 | 15·4 |
| 15. Rahang .... | 75·5 | 1·8 | 22·7 |
| 16. Serai .... | 75·5 | 5·3 | 19·2 |
| 17. Tappa Kanman .... | 56· | 13·4 | 30·6 |
| 18. Athaisi .... | 38·6 | 8·3 | 53·1 |
| Total* | 71· | 5·1 | 23·9 |

The Parganas in which the percentage of cultivation most exceeds the average are Paschimduai and Kotrahang, which are both well protected by embankments from river flood. Kotdes, which is partially protected, comes next, and Purbaduai follows Kotdes. It must be said that the figures do not truly represent the present situation, and that, since the first Survey was made, much land has been thrown out of cultivation on account of the calamitous floods of recent years. Parganas Antrodh, Banchas, Lembai, Rahang and Serai are partly protected by embankments and partly exposed to flood. In Pargana Serai some of the land shown as cultivated has gone out of cultivation.

Of the Parganas in which the percentage falls below the average, Damarkhand, Kodhar and Kurelo run the average close. For the low percentages obtaining in other Parganas there are special reasons. Thus in Matkatpatna which has the lowest figure of all, and in Athaisi which is not much better, about half of the entire area consists of a belt of shores, and varying from 2 to 4 miles in width in which cultivation is a physical impossibility. The same reason applies to Oldhar, and in a lesser degree to Tappa Kanman, Astrang and Chaubiskud. In all these four last Parganas there is also considerable liability to inundation either from river or salt floods.

Of the Thanas, Pipli, which includes Kotrahang, Lembai, Paschimduai and Kotdes, is most highly cultivated. The percentage is 76. Thana Gope, which includes Athaisi, Astrang, Oldhar and Matkatpatna, as well as Antrodh and Banchas, is the least highly cultivated. The percentage is 62 as against 70 in Thana Puri, which contains Rahang, Chaubiskud and Serai.

* For all the cadastrally surveyed portions of the subdivision as in Appendix E.

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The percentage of land that has been shown in the *milan khasra* statements as culturable is exceedingly small, only 5·1 per cent. for the Subdivision. This is probably an understatement. It may be expected that a large slice of the 23·9 per cent. entered as unculturable will gradually be reclaimed as the increase of population presses harder on the resources of the soil. It is noticeable that in the five Parganas situate in the north-east corner of the district, viz., Astrang, Damarkhand, Kurelo, Tappa Kanman and Kodhar, the highest percentages of culturable lands are shown. There is a considerable amount of low scrub jungle in these Parganas, and much of this has probably been entered as culturable. The differentiation between culturable and unculturable obviously depends much on the individual opinion of the officer in charge of the survey party. The amins working in the five Parganas were probably working under the supervision of one and the same Officer.

**Extension of cultivation since last Settlement.**

96. There are two sources from which the extension of cultivation since last settlement can be estimated. The first and less reliable guide is a comparison of the Survey records of 1837-41 with the present *milan khasra*. More reliable information is to be obtained by comparing the assessed areas of estates according to the records of the last and of the present Settlements. The Survey record of course refers to alarger area, to the whole of the temporarily-settled Parganas. The Settlement records refer exclusively to temporarily-settled estates situated within the temporarily-settled Parganas. I make the former comparison by Parganas and the latter by completion blocks.

The Survey comparison gives the following results :—

| NAME OF PARGANA. | ACCORDING TO SURVEY OF 1837-41. | | ACCORDING TO PRESENT SURVEY. | | Percentage of increased cultivation. | Proportion of present cultivated to total area. |
|---|---|---|---|---|---|---|
| | Tiotal area in acres. | Cultivated area in acre. | Total area in acres. | Cultivated area in acres. | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Antrodh .... | 33,926 | 26,352 | 34,054 | 26,909 | 2·1 | 79 |
| 2. Astrang .... | 5,594 | 2,728 | 5,743 | 2,839 | 3 | 49·4 |
| 3. Banchas .... | 12,329 | 14,294 | 19,413 | 14,804 | 3.5 | 76·2 |
| 4. Chaubiskud .... | 67,498 | 20,341 | 64,220 | 37,484 | 84·2 | 58·24 |
| 5. Damarkhand .... | 18,767 | 12,356 | 18,876 | 13,012 | 5·3 | 68·9 |
| 6. Kodhar .... | 17,406 | 11,664 | 17,574 | 12,210 | 4.7 | 69·4 |
| 7. Kotdes .... | 1,16,194 | 86,020 | 1,16,296 | 92,455 | 7·4 | 79·4 |
| 8. Kotrahang .... | 35,728 | 17,913 | 35,666 | 29,346 | 63·8 | 82·3 |
| 9. Kurelo .... | 12,806 | 7,033 | 12,916 | 8,081 | 14.9 | 62·5 |
| 10. Lembai .... | 57,580 | 30,807 | 57,575 | 45,161 | 46·6 | 78·3 |
| 11. Matkatpatna .... | 6,915 | 2,203 | 6,709 | 2,383 | 8 1 | 35·5 |
| 12. Oldhar .... | 26,331 | 1,875 | 26,319 | 12,195 | 550·4 | 46·3 |
| 13. Paschimduai .... | 16,589 | 5,613 | 16,650 | 13,642 | 143. | 82·5 |
| 14. Purbaduai .... | 20,802 | 4,283 | 20,888 | 16,559 | 286·6 | 79·2 |
| 15. Rahang .... | 95,679 | 67,480 | 96,150 | 72,503 | 6.9 | 75 5 |
| 16. Serai .... | 43,308 | 23,356 | 43,091 | 32,526 | 39·3 | 75·5 |
| 17. Tappa Kanman .... | 4,208 | 2,024 | 4,163 | 2,335 | 15·8 | 56 |
| 18. Athaisi .... | 33,289 | 11,975 | 33,363 | 12,893 | 7.7 | 38·6 |
| Total | 6,24,949 | 3,48,317 | 6,29,666 | 4,47,337 | 28.4 | 71·6 |

A comparison, however, of Survey figures with Settlement figures renders the distribution of areas in the former exceedingly doubtful. The Settlements were made within a year or two of the Survey. They were made by responsible officers working on the spot, and the mistakes of the Survey amins were cleared up before assessment was made. The Settlement records show a very different state of things from that shown by the Survey. I give below, by completion blocks,

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a comparison with last Settlement, and add a column to show how widely the results differ from the figures of the previous statement :—

| Name of Block | Completion | AT LAST SETTLEMENT. Total area in acres. | AT LAST SETTLEMENT. Assessed area in acres. | AT PRESENT SETTLMENT. Total area in acres. | AT PRESENT SETTLMENT. Assessed area in acres. | Present age of increase in assessed area. | Percentage of present assessed area to total area. |
|---|---|---|---|---|---|---|---|
| 1 | | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. West Athaisiand.... Matkatpatna | .... | 10,612 | 3,405 | 10,660 | 3,883 | 14·0 | 6·4 |
| 2. East Athaisi and Damarkhand | .... | 32,507 | 15,397 | 36,453 | 18,027 | 34·5 | 49·4 |
| 3. Banchas | .... | 12,577 | 3,818 | 12,742 | 9,194 | 17·6 | 72·2 |
| 4. Kodhar | .... | 25,896 | 11,574 | 25,951 | 15,934 | 37·7 | 61·4 |
| 5. Lembai | .... | 54,926 | 35,131 | 53,123 | 44,327 | 26·2 | 83·4 |
| 6. Rahang | .... | 62,215 | 58,100 | 68,764 | 54,540 | 13·4 | 79·3 |
| 7. Kotdes, including Antrodh | .... | 1,21,006 | 78,020 | 1,22,981 | 97,552 | 25·0 | 79·4 |
| 8. Kotrahang | .... | 27,632 | 20,005 | 28,041 | 23,305 | 16·5 | 83·1 |
| 9. Paschimduai | .... | 11,093 | 7,704 | 11,578 | 9,431 | 27·3 | 81·4 |
| 10. Chaubiskud | .... | 43,345 | 23,990 | 56,570 | 30,873 | 28·7 | 54·6 |
| 11. Serai | .... | 41,653 | 25,398 | 40,310 | 31,384 | 23·6 | 77·8 |
| 12. Purbaduai, Oldhar | | 37,754 | 14,415 | 37,787 | 18,340 | 27·2 | 48·5 |
| 13. Scattered estates | | 14,916 | 11,247 | 15,217 | 13,780 | 22·5 | 75·0 |
| 14. Estates with lands in Cuttack. | .... | 3,024 | 2,237 | 3,086 | 2,751 | 23·0 | 74·0 |
| Total | .... | 4,99,155 | 3,02,441 | 5,23,263 | 3,73,321 | 23·4 | 71·3 |

The Settlement figures are much more reasonable and much more intelligible than the Survey figures. While they show a total increase of 23·4 per cent., not differing widely from the total according to Survey records, they distribute the extension much more evenly over the whole district. The increase does not fall below 13 per cent. nor rise above 38, whereas according to Survey records, it ranges from 2 per cent. to 550 per cent. The Parganas in which there has been least increase have been west Athaisi, Matkatpatna, Banchas, Rahang and Kotrahang. These, except Kotrahang, are Parganas in which Survey records also showed little advance. It is worthy of notice that in Kotrahang, one of the first Parganas to be assessed, a considerable area lying fallow but culturable, was assessed to rent by the Settlement Officers of 1837. The Parganas in which the extension is notably above the average are Kodhar, Kurelo, Tappa Kanman, Astrang and Damarkhand. The area available for reclamation in all these Parganas was extensive.

At the last Settlement three-fifths of the total area of the temporarily-settled estates was brought under assessment. The proportion has now risen to over seven-tenths, and, as has been stated in paragraph 95 of the report, of the remaining three-tenths, only about one-sixth is capable of reclamation. The reclamation of new land during the sixty years of the last Settlement was a prolific source of advantage to zamindars and proprietary tenure-holders. In this district it was almost the sole cause of the increase of assets which has rendered the present enhancement of Government revenue possible. This source of increase has now almost been exhausted, and for at least fifteen years of the new Settlement proprietary income and estate assets must remain practically stationary.

**Composition of the unassessed area at last and present Settlement.**

97. The composition of the unassessed areas at the last and the present Settlement is shown in the following statement :—

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| LAST SETTLEMENT. | Area in Acres. | percentage. | PRESENT SETTLEMENT. | Area in Acres. | Percentage. |
|---|---|---|---|---|---|
| Unculturable waste. (*nalaik padia*). | .... 1,76,000 | 31·2 | Unculturible lands | 84,800 | 16·2 |
| | | | Jungle | 13,800 | 2·6 |
| | | | Old fallow | 20,100 | 3·8 |
| Culturable waste (*laikpadia*) .... | 4,600 | ·9 | Grazing reserve | 19,800 | 2·3 |
| | | | Cremation reserve | 1,500 | ·3 |
| Jungle .... | 25,600 | 5·1 | Current fallow | 4,400 | ·8 |
| ***Minha*** .... | 3,400 | ·7 | Tanks and | | |
| ***Jagir*** .... | 7,100 | 1·4 | miscellaneous | 500 | ·1 |
| | | | Orchards | 1,400 | ·2 |
| | | | ***Minha*** | 1,900 | ·4 |
| | | | ***Jagir*** | 1,800 | ·3 |
| Total unassessed | 1,96,700 | 39·3 | Total unassessed. | 1,50,000 | 27·0 |
| Total assessed | 3,02,400 | 60·6 | Total assessed. | 3,73,300 | 73·0 |
| Total .... | 4,99,100 | 100 | Total | 5,23,300 | 100 |

***Nalaik padia*** appears to have been a description that was not applied with any pretence to accuracy. Nearly one-half of the area must have come under cultivation during the sixty years of Settlement. It is probable that in the same way, though to much more limited extent, the present term "unculturable" will be found to be a misnomer. The small areas under jungle and orchard will be noted.

**Distribution of the principal Crops.**

98. Appendices E and F give, Thana by Thana, the crop statement of the Sadar Subdivision (the permanently-settled Parganas excluded). From this has been extracted the following statement, which shows for each Pargana the proportionate distribution of the principal crops :—

| NAME OF PARGANA | Percentage of early rice. | Percentage of winter rice. | Percentage of spring rice. | Percentage of *mandia* | Percentage of *kulthi* & other pulses. | Percentage of *bari*. | Percentage of orchards. | Miscellaneous. | Percentage of double-cropped area to net cropped area. |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1. Antrodh | 7.4 | 70.8 | 0.3 | 3.7 | 11.8 | 3.3 | 1.8 | 0.8 | 9.7 |
| 2. Astrang | 3.1 | 82.2 | 0.3 | 4.4 | 4.1 | 4.3 | 1.3 | 0.6 | 3.5 |
| 3. Banchas | 2.6 | 78.8 | 1.4 | 3.8 | 6.5 | 3.6 | 2.3 | 1.0 | 5.7 |
| 4. Chaubiskud | 0.7 | 88.0 | 2.6 | 0.8 | 1.9 | 1.7 | 4.0 | 0.3 | 1.4 |
| 5. Damarkhand | 5.8 | 74.4 | 1.7 | 3.0 | 8.4 | 3.7 | 2.0 | 1.0 | 6.2 |
| 6. Kodhar | 5.5 | 75.8 | 0.2 | 4.5 | 6.6 | 3.4 | 2.1 | 1.9 | 5.2 |
| 7. Kotdes | 3.4 | 66.3 | 0.1 | 0.4 | 16.7 | 4.2 | 3.4 | 0.7 | 18.7 |
| 8. Kotrahang | 10.1 | 61.7 | 0.3 | 3.5 | 14.9 | 3.6 | 4.7 | 1.2 | 15.9 |
| 9. Kurelo | 3.2 | 61.4 | 1.5 | 7.9 | 10.2 | 5.9 | 2.7 | 2.2 | 7.0 |
| 10. Lembai | 6.2 | 74.4 | 0.2 | 0.3 | 12.3 | 3.5 | 2.5 | 0.6 | 10.8 |
| 11. Matkatpatna | 4.0 | 72.4 | 9.1 | 2.0 | 4.6 | 3.1 | 2.2 | 2.5 | 2.7 |
| 12. Oldhar | 2.4 | 48.1 | 31.7 | 1.6 | 2.9 | 2.2 | 1.9 | 1.2 | 2.3 |
| 13. Paschimduai | 19.1 | 44.7 | 1.2 | 0.9 | 24.2 | 3.5 | 4.7 | 1.7 | 30.9 |
| 14. Purbaduai | 4.2 | 78.5 | 1.5 | 3.1 | 7.3 | 3.1 | 1.3 | 0.5 | 6.6 |
| 15. Rahang | 1.7 | 72.7 | 8.8 | 1.1 | 4.4 | 2 3 | 8.1 | 0.9 | 3.1 |
| 16. Serai | 1 5 | 89.5 | 4.2 | 0.4 | 1.8 | 1.5 | 0.8 | 0.3 | 1.6 |
| 17. Tappa-Kanman | 7.9 | 68.0 | 0.3 | 6.1 | 6.7 | 5.1 | 1.8 | 4.1 | 9.2 |
| 18. Athaisi | 6.1 | 69.6 | 4.8 | 4.7 | 7.2 | 3.4 | 2.4 | 1.8 | 6.9 |
| Total | 6.3 | 78.4 | 3.5 | 1.9 | 10.9 | 3.3 | 4.1 | 0.4 | 9.3 |

From the Subdivisional total it will appear that winter rice (***sarad***) is grown on 78·4 per cent. of the total cropped area. The proportions of early (***biali***) and spring (***dalua***) rice are very small. The pulses occupy 10·1 per cent. of the total area. The two chief pulse crops are ***kulthi*** and ***mung***. It is unfortunate that separate figures have not been prepared for each of these crops. My impression gathered from touring about in the district, was that the larger area is occupied by ***kulthi***, but some Assistant Settlement Officers were of opinion that there is a preponderance of ***mung***. In estimating below the food-supply of the district, I have



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assumed that the two occupy equal areas. The area grown with ***mandia*** is very small. ***Bari*** lands and orchards cover 3·1 and 3·4 per cent. respectively of the cropped area. The area that is double cropped is 9·3 per cent. of the whole. There is, however, considerable reason to believe that the area shown as double-cropped and consequently also the areas shown as grown with ***mandia*** and pulse crops are under-estimates. It has always struck me while on tour that a very much larger proportion than 10 per cent. of the cropped area was cultivated in the cold weather with ***mardia, kulthi, mung*** and ***biri*** crops, and this impression has been corroborated by statements of Assistant Settlement Officers and Kanungos, who say that when Survey operation was first commenced—that is, in 1889-90—raiyats and zamindars combined together wholesale to conceal the double-cropped area, and for two or three years refrained from growing winter crops. It was fancied that the new assessments would be a ***fasal-bandhi*** assessment, and much was to be gained by concealing the ***dofasali*** land. As the assessment has been made on the basis of existing ***pahi*** rents, raiyats and zamindars have gained nothing by the fraud, but we have been deprived of data from which the true food-supply of the District can be estimated. Varying estimates of the true ***dofasal*** area have been given to me by different officers. Some have placed the proportion as high as 33 per cent. I do not think that it can be much less than 20 per cent.

Keeping these general remarks in mind, we may now look at the distribution of crops by Parganas. The figures which disclose most striking divergence from the normal have been in the statement put in bold figures and may be briefly noticed as follows:—

**Early rice.**

Early rice is grown in largest quantities in Parganas Kotrahang and Paschimduai. These are both protected Parganas of very varied level with a considerable proportion of high land. The Parganas in which least ***biali*** is grown are Rahang, Serai and Chaubiskud, which are all situated round the lower reaches of the great rivers at the point where they enter the sea and the Chilka. The lands of these Parganas are low-lying and flat and consequently not suited to early crops.

**Winter rice.**

Winter rice is the principal crop in all Parganas, but the most striking preponderance is in the two Parganas Serai and Chaubiskud which grow least ***biali***.

The proportion is lowest in Oldhar, which contains extensive ***dalua*** lands, and in Paschimduai with its larger ***biali*** and pulse-cropped areas.

**Spring rice.**

Spring rice is grown in very small areas except in Parganas Oldhar, Matkatpatna and Rahang, Oldhar Pargana includes the Sar Lake, a fresh water lagoon into which the Bhargabi discharges through its escape channels, the Bengai and Kanchi ***rivers***. The lake is about 6 square miles in extent and very shallow, and a large portion is cultivated with ***dalua*** in winter months. In Matkatpatna the presence of the Kushabhadra river which runs through the Pargana enables some ***dalua*** lands to be irrigated up to February or March, after which date the river becomes tidal. In Rahang ***dalua*** is grown chiefly on the Samang-***pat***, a large expanse of low lying country north of Puri town which gets flooded annually from the Bhargabi through the Dhanua, East Kania and Athar-nala escape channels.

**Mandia.**

***Mandia*** is grown in comparatively small areas chiefly as a second crop. It will be noticed that it favours most the north-east Parganas, Kodhar, Kurelo, Tappa Kanman and Astrang (included in the Kodhar block), and Athaisi, which adjoin Cuttack.

**Kulthi, Mung and Biri.**

***Kulthi, mung*** and ***biri***, the principal crops of the Pulse group, are grown chiefly on double-cropped land, and therefore most extensively in Parganas Kotdesh, Kotrahang and Paschimduai, which alone have exceptionally large double-cropped areas. The very small areas covered by pulse crops in Parganas Chaubiskud, Oldhar, Rahang and Serai are, as I have said above, probably less than actual.

**Homestead lands and gardens.**

Homestead lands and gardens are diffused more or less evenly over the Subdivision. The area is conspicuously small only in Chaubiskud and Serai. These two Parganas are situated close to the Chilka. I have noted in the general description how the village sites in this tract consist of bare isolated mounds rising only a little above the general level.

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Orchards, like homestead, are more or less evenly distributed. The area is noticeably small in Serai Pargana. It is large in Chaubiskud, because there is a large tract lying between the cultivated land in the heart of the Pargana and the belt of sand to the south-east which is covered with scrub jungles and fruit trees.

Orchards.

Miscellaneous includes a multitude of crops which are all grown on areas so small that percentages if calculated would not be of any particular interest.

Miscellaneous.

The chief miscellaneous crops are castor oil, sugarcane, cotton, indigo, *pan*, tobacco and vegetables.

The castor plant is grown in small quantities in all Parganas. Its cultivation is most extended in Athaisi and least in Serai.

(i) Castor-oil.

Sugarcane is, according to Survey records, grown in all parganas except Chaubiskud, Serai and Matkatpatna. It is pobably cultivated in portions of these three Parganas, but has escaped the notice of the Survey amins. The sugarcane areas in Parganas Athaisi, Kurelo and Tappa Kanman are relatively greater than else where.

(ii) Sugarcane.

Cotton is grown in small quantities in all Parganas except Oldhar. There is very little in Matkatpatna, Serai, Chaubiskud and Paschimduai. The area is relatively greatest in Kodhar Pargana.

(iii) Cotton.

Indigo (included under "Dyes—other") is grown in very small quantities in 13 out of the 18 Parganas of the Sub-division. It is found chiefly in Kotdes Antrodh, Kotrahang and Damarkhand.

(iv) Indigo.

*Pan* (Betel) is grown in small quantities in ten Parganas—chiefly in Damarkhand, Rahang, Lembai and Kotrahang. In north-west Damarkhand there is a *pan*-growing centre at a place called Narsingpur. Cultivation has extended much of recent years and the particular variety grown there has established for itself popularity in the Cuttack and Calcutta markets, and is known by its local name as "Narsingpur *pân*". The *pân*-gardens of Kotrahang, Lembai and Rahang are to be found chiefly close to the Jagannath Road. The *pân* grown in these gardens is sold to pilgrims and exported to Puri town.

(v) Pân (Betel)

Tabacco is grown in 11 Parganas. The largest areas are in Kotdes, Rahang and Paschimduai. The tabacco grown is for the most part consumed locally.

(vi) Tobacco.

Vegetables (included under "Miscellaneous crops—Food—others") are grown everywhere on riverside lands and lands adjoining the village sites. The areas are relatively large in Rahang, Kotdes, Kotrahang, Lembai and Paschimduai which are traversed by the principal rivers of the district and have extensive village sites. They are infinitesimal in Damarkhand, Astrang, Kurelo, Tappa Kanman, four of the north-eastern Parganas. The chief varieties are mentioned in Mr. Nathan's note quoted above.

(vii) Vegetables.

99. Mr. Nathan gives the following estimate of outturn per acre of the different classes of paddy :—

Outturn of crops.

| | | Gauni. | | Standard seers |
|---|---|---|---|---|
| *Biali* | .... | 20 to 120 | average | 322 |
| *Chota laghu* | .... | 50 to 60 | ,, | 253 |
| Medium *laghu* | .... | 100 to 120 | ,, | 506 |
| *Bara laghu* | .... | 140 to 160 | ,, | 690 |
| *Sarad* | .... | 200 to 220 | ,, | 966 |
| *Bara dhan* | .... | 200 to 240 | ,, | 1012 |

Very few crop experiments have yet been made in Puri District, and it is therefore impossible to say how far these estimates which are based on enquiries made from cultivators can be accepted.

The only Puri experiments of which I could find records are the following:—

| | Average outturn in seers. |
|---|---|
| Four made by Assistant Settlement Officer Babu Jatindra Mohan Sinha. .... | 669 |
| Five made by Assistant Settlement Officer Babu Sudarsan Das .... | 882 |

The general average of these experiments is nearly 800 seers.

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As the Puri lands are none of them irrigated by canals, we may compare the averages found on irrigated lands of Cuttack and Balasore in the field season of 1895-96. In Cuttack the average of 28 cuttings was found to be 961 seers per acre, and in Balasore the average of 21 cuttings was found to be 936 seers.

In view of these estimates and experiments I think the produce of average *sarad* land may safely be taken at 900 seers per acre *.

The produce of *biali* lands varies within very wide limits. Some *biali* land is as good or better than first class *sarad* land, while on the other hand some is very poor. For want of exact information I think we may take the average of Mr. Nathan's estimates for *biali* and the three *laghus* as an approximation. The average is 443 seers, we may say 450 seers. For estimating the produce of *dalua* lands there are no Puri experiments to assist, but I take the following from the statement published with the Director of the Department of Land Records and Agriculture's No. 356A., dated 3rd March 1898. The average of experiments in the Cuttack and Balasore Districts was 1, 226 lbs or 613 seers; 600 seers may be taken for simplicity.

About the outturn of crops other than rice there is at present absolute uncertainty, as will appear from a comparison of Mr. Nathan's estimates with averages entered in the above statements. I give them side by side :—

| Name of Crops. | Outturn per acre in seers. Mr. Nathan's estimates | Director of the Land Records and Agriculture's statement of 3rd March 1898 (lbs. converted into seers.) | Approximately | |
|---|---|---|---|---|
| *Mandia* .... | 92 | 616 | 600 | Mr. Nathan's ave- |
| *Mung* .... | 92 | 376 | 400 | rage for *mandia,* |
| *Kulthi* .... | 184 | 545 | 550 | *mung* and *kulthi* |
| *Arhar* .... | .... | 510 | 500 | appear to be inex- |
| *Biri* .... | .... | 375 | 400 | plicably low; esti- |
| *Chana* (grain) | .... | 467 | 450 | mates based on |
| *Gabo* (Caster oil) | 92 | .... | .... | experiments are |
| *Rasi* (Til) | 69 | .... | .... | more reliable. |
| Mustard | .... | 215 | 200 | |
| Sugarcane | .... | 1,735 | 1,700 | |
| Wheat | .... | 355 | 360 | |

Of Cotton or Jute I can find no estimate. An acre *pân* garden yields about 7,200,000 leaves a year, according to an estimate made by Mr.D.H. Kingsford, Assistant Settlement Officer in charge, Balasore.

An acre of tobacco land yields about 12,500 leaves (Mr. Nathan says five *joris* per *gunt*, each *jori* consisting of two strings with 50 leaves on each).

**Food-Supply of district.**

100. In the last section I have endeavoured to throw together some information on the subject of average outturns. It will be seen how imperfect and incomplete are the data available, but they are the best we have and I propose to use them in order to prepare a rough estimate of the food supply of the Subdivision. The crop statement of the Sub-division is confined to the temporarily-settled Parganas, that is to about 1,000 square miles out of total of nearly 1,200 (excluding the Chilka Lake).

The food-supply in this area may be estimated thus :—

| Crop. | Area in acres. | Averge outturn per acre in seers. | Total in maunds. |
|---|---|---|---|
| Rice— | | | |
| *Biali* .... | 28,000 | 450 | 3,15,000 |
| *Sarad* .... | 3,56,000 | 900 | 79,65,000 |
| *Dalua* .... | 16,000 | 600 | 2,40,000 |
| Total—Rice .... | 4,00,000 | .... | 85,20,000 |
| Pulses— | | | |
| *Mandia* .... | 9,000 | 600 | 1,35,000 |
| *Kulthi*† .... | 24,700 | 550 | 3,40,000 |
| *Mung*† .... | 24,700 | 400 | 2,47,000 |
| *Sugarcane* .... | 560 | 1,700 | 24,000 |
| Total-Pulse, &c. | 58,960 | .... | 7,46,000 |
| Grand Total .... | 4,58,960 | .... | 92,66,000 |

* This is Mr. Mcpherson's estimate. It is higher than that adopted by me in chapter VI of this report.

† There are not separate figures for *kulthi* and *mung* but as noted above, I have assumed that they are grown over a more or less equal extent of country.

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The areas under wheat, maize, *chana* and other miscellaneous food crops are in appreciably small, and it is unnecessary to include them in the estimate. The total area under oil-seeds is only 1,000 acres, and the outturn varies so much according to the situation of the land and the variety of crop that an estimate of the total yield is impossible. It is unnecessary to allude here to the non-food crops, which also occupy an infinitesimally small proportion of the cultivated area of the District.

**Note about population.**

101. The information that is procurable regarding the earlier fluctuations in the district population is very meagre and unreliable. The first regular census was made in 1872. Piror to that we have only rough estimates made by the Police and Survey Departments and based on the numbering of houses. At page 232 of the Famine Commissioner's Report of 1866 there is a statement of the population of the District by Parganas compiled by the Police in October 1866. It shows the number of inhabitants before the famine and the number that died during the famine. From the Survey offiice, I have obtained a statement of the number of houses and number of inhabitants cmpiled in the Survey operations of 1837-42 for all Parganas of the District except Malud, Bajrakote, Parikud, Manikpatna, Chaubiskud and Serai. I find that for the Parganas for which the figures of both periods are available, the increase of population for 1837 to 1865 amounted to 16 per cent.

Assuming that the same increase occurred in the six Parganas mentioned we are able to construct the following comparative table for the three periods 1837-41-1865 (before the famine) and 1866 (after the famine):—

| Name of Parganas. | Population in 1837-41. | Population in 1865. | Population after famine. |
|---|---|---|---|
| Malud .... | (2,870) | 3,329 | 1,812 |
| Bajrakote .... | (3,312) | 3,842 | 1,947 |
| Parikud .... | (8,823) | 10,238 | 4,433 |
| Manikpatna .... | (5,262) | 6,104 | 1,679 |
| Chaubiskud .... | (24,701) | 28,654 | 9,727 |
| Serai .... | (9,813) | 11,384 | 3,966 |
| Rahang .... | 88,228 | 80,375 | 43,229 |
| Lembai .... | 29,979 | 41,896 | 37,896 |
| Kotrahang .... | 72,556 | 39,889 | 27,889 |
| Paschimduai .... | 14,636 | 18,326 | 16,828 |
| Purbaduai .... | 11,083 | 13,829 | 8,395 |
| Kotdes .... | 86,951 | 93,424 | 53,603 |
| Banchas .... | 10,280 | 10,067 | 5,781 |
| Athaisi .... | 6,926 | 13,447 | 7,561 |
| Antrodh .... | 15,900 | 20,683 | 10,663 |
| Astrang .... | 1,274 | 2,293 | 745 |
| Kurelo .... | 5,433 | 10,920 | 5,233 |
| Kodhar .... | 7,807 | 14,102 | 6,622 |
| Marichpur .... | 6,421 | 7,449 | 3,222 |
| Damarkhand .... | 7,930 | 12,445 | 5,532 |
| Oldhar .... | 6,318 | 8,400 | 4,296 |
| Matkatpatna | 1,062 | 1,039 | 603 |
| Total .... | 3,77,559 | 4,52,133 | 2,61,610 |

The increase of population in the first thirty years of the Settlement averaged as before mentioned 16 per cent. Then came the terrible calamity of the great famine, which according to the Police numbering reduced the population of the Sadar Subdivision by over 40 per cent. The population in 1866 remained about 30 per cent. below what it had been thirty years before.

The first regular census was made in 1872. In this, as in the Census Reports of 1881 and 1891, the statistics that were compiled are *Thanawar* and it is impossible to extract figures for each Pargana without an amount of expenditure and trouble incommensurate with the object. Looking however, for the present, to the Subdivision as a whole, we find that in 1872 the population had gone up to



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488, 751. In 1881 it rose to 564, 759 and in 1891 to 613, 575. The fluctuation may be shown briefly thus :—

| Period of numbering of census. | Population. | Percentage of variation on previous period. | Percentage of variation on last settlement Survey numbering. |
|---|---|---|---|
| 1837–41 ( Survey ) | 377,559 | .... | .... |
| 1865 (before Famine) | 443,133 | +16 | +16 |
| 1866 (after Famine) | 261,610 | −40 | −30 |
| 1872 | 488,751 | +87 | +30 |
| 1881 | 564,759 | +15 | +50 |
| 1891 | 613,575 | + 8 | +62 |

The most remarkable fact in the history of the district population is the celerity with which it recovered after the violent interruption of the Famine year. In six years the population nearly doubled itself, but this can scarcely be regarded as within the bounds of possibility and the true explanation seems to be either that the population before the famine was very much under estimated or that the number of deaths was very much over-estimated. Both causes were probably at work. It is exceedingly likely that as the number of deaths was estimated from the number of empty and deserted houses. a great many people who had temporarily removed to Khurda and the *Garhjats* were counted amongst the dead. Leaving out of account the extraordinary disturbance of the Famine year, and comparing the population of 1872 with the previous population of 1837 and 1865 and with the subsequent censuses of 1881 and 1891, it will appear that there has been a steady advance in the population. The growth from 1872 to 1891 has been 25 per cent. It is not improbable, then, that the advance from 1837 to 1872 amounted to 30 per cent., and I am therefore inclined to place considerable reliance on the result of the Survey count of last Settlement.

The statistical records of the censuses of 1872, 1881 and 1891 being *Thanawar*, I have endeavoured for the sake of comparison to build up Thana totals from the Pargana figures of 1837 and 1865. For Parganas not contained entirely within one Thana a division has been made according to the existing number of houses as counted in the present Survey and Settlement Operations. An attempt has also been made to estimate the present population of the District. The number of houses in each thana being known, it has been multiplied by the *Thanawar* average number of persons to each house according to the 1891 census. In this way the following comparative table has been prepared :—

| Name of Thana. | Population in 1837-41. | Population in 1865. | Population in 1872. | Population in 1881 | Population in 1891. | Present number of houses. | Multiplicand per house according to census of 1891. | Estimated Present Population | Variation of present estimated population and Population at last Settlement. | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 11 |
| Gope .. | 74,796 | 106,844 | 96,096 | 116,167 | 134,038 | 23,868 | 6·0 | 143,208 | 91 | | Thana Puri includes the town of Puri and Nabba thana of the 1872 census. |
| Pipli .. | 144,493 | 171,542 | 204,375 | 226,782 | 241,470 | 45,655 | 5·3 | 241,971 | 73 | | |
| puri .. | 158,270 | 164,647 | 188,280 | 221,810 | 238,067 | 38,302 | 5·6 | 214,491 | 55 | | |
| | | | | | | 6,927 (Town) | 4·4 | 30,479 | | | |
| | | | | | | | | 244,970 | | | |
| Total .. | 377,559 | 443,133 | 488,751 | 564,759 | 613,575 | 114,752 | .... | 630,149 | 66 | | |

The present estimated population is only 2·7 per cent. in advance of that ascertained in 1891. The advance of 1891 on 1872 was 15 per cent., and of 1891 on 1881 8 per cent. It may be that the pressure of population on the resources of the soil has gone almost as far as it can go and that this is the cause of the slightness of the advance made during the last decade. On the other hand the Survey count of houses may be incorrect and this method of estimating the population does not in any case pretend to be very exact. The table shows that the growth of population has been greatest in Thana Gope. This is not unnatural, as that Thana was at Last Settlement and still is the least developed of the three. It is still much more cut off from the rest of the world by absence of communication than Thanas Pipli and Puri, which have in addition to the Trunk road, recently acquired the convenience of Railway communication. Looking to the general result of the above enquiries it may I think be safely assumed that the increase in the population of the Sadar subdivision during the term of the last Settlement has been not less than 60 per cent. The importance of this conclusion from the revenue and rent point of view will be discussed below.

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Division by sex.

The number of males as shown in the census returns is slightly in excess of the number of females, especially in Puri Town. The proportions are-For the Subdivision, males, 50·6; females, 49·4. For Puri Twon-males, 55·3; females, 44·7.

Division of religion.

Puri being one of the chief strongholds of Hinduism it is not surprising to find that Hindus compose 98·6 per cent.of the total population. Musalmans represent 1·3 per cent. The proportion of Hindus is highest near the precincts of the sacred city, viz., in Puri Thana and Puri Town· There are a large number of Musalmans in village Gope, accounting for the high proportion in that Thana.

The general proportion of Hindus to Musalmans throughout Bengal in 1891 was 64·07 and 31·70 per cent., respectively; in Cuttack 97·00 and 2·73; in Balasore, 97·90 and 2·10. Puri is thus pre-eminently a home of the Hindus.

Immigration.

It will be seen from the census statements that nearly 7 per cent. of the resident population in 1891 consisted of immigrants. By far the largest number came from Cuttack District, and of these most settled in Thanas Gope and Pipli; where it may be presumed they engaged in cultivation and its accessory occupations. The settlers in the southern portion of the District came chiefly from Madras. The recorded immigrants of Puri Town were probably for the most part pilgrims. There is no emigration from the District in the more special sense of the term. There is a constant influx and efflux of pilgrims and labour between Puri and the neighbouring districts of Ganjam and Cuttack, but there is no cooly emigration. The difficulty of communication with Calcutta has been hitherto a well-nigh insuperable obstacle. Now that it is shortly to be removed we may expect to find the cooly recuiter in the District. The year 1896 was a year in which there was more movement of population than usual. The scarcity prevailing in the flooded Parganas Purbaduai, Oldhar, Serai and Chaubiskud drove many of the poorer agricultural labourers to seek work on the East Coast and Bengal Nagpur Railways. Many of these labourers have not yet returned to their homes as the prospect of cultivation in Purbaduai and Oldhar is still by no means bright.

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# PART II.

## CHAPTER V.

### IRRIGATION AND PROTECTION IN ORISSA.

103. In the last three chapters an account of the effects of flood and drought, and of the measures adopted in each of the three districts to mitigate such effects, has already been given, and I now propose to give a summary of the history of irrigation in Orissa and of the influence of canals and embankments on rents and revenues.

The correspondece on this subject ended with letter No. 1764 S. of the 4th October, 1899 from the Director of Land Records and Agriculture to the Secretary to the Board of Revenue in paragraph 7 of which it was promised that the question should be dealt with in the final report on the Settlement, that in order to make this part of the report complete in itself a good deal of valuation that may also be found elsewhere is here repeated.

History of the canals.

104. The Orissa canals were begun by the East India Irrigation Company, on the failure of which the works were taken over by Government at a valuation.

The present project was commenced in 1868 at an estimated cost of Rs. 3,23,15,845 including Rs. 2,94,089 for loss by exchange, and the construction estimate was closed on the 31st. March, 1895. Two estimates aggregating Rs. 61,858 were sanctioned by the Bengal Government in 1893 and 1895, and the total expenditure to the end of 1895-96, against the old and current sanctions, amounted to Rs. 2,62,21,846 including a sum of Rs. 2,68,070 for loss by exchange; the expenditure of a lakh-and-a-half in the next two years raised the total to Rs. 2,63,73,151. As the result of this out-lay*, the Province of Orissa has been provided with the following works, which are for the most part situated in the Cuttack District :—Seven weirs across river channels with an aggregate length of 3½ miles, and constituting, with the canal head sluices and entrance locks, the most extensive system of headworks of any canal system in India. There are 204¾ miles of canals, which are navigable in addition to carrying water for irrigation; there are also 75 miles canal for irrigation only. Besides, there are 109¾ miles of distributaries and village channels. The maximum discharge of the canals in 1895-96 was 6,058 cubic feet per second and the area shown as commanded is 56,20,000 acres.†

The Orissa canals have never paid their way; the water rate is only Re. 1-8 per acre and the receipts for big navigation and irrigation barely cover the working charges and do not touch the interest. Thus it was natural that the responsible officers and Government should cast about for a means of meeting the deficit. As early as 1874 Colonel Gulliver proposed an extra rate of annas 8 per acre for protection; and in 1877 a Bill was drafted and introduced into the Bengal Council with the object of imposing a compulsory cess upon the occupants of all lands irrigable from, or protected by, the Orissa and south Bihar canals, Mr. G. Toynbee, I. C. S., being deputed on special duty in the same year to make special enquiries in Orissa in connection with it. The Bill was, however, subsequently drafted, mainly on the ground that the prospects of irrigation in South Bihar were more favourable than had been expected. In 1881 some further suggestions were made by the officers of the Public Works Department for the ehancement, during the coming Settlement, of *pahi* rents by Rs. 2-8 per acre where efficient protection had been given ( see Mr. Commissioner Smith's letter No. 326 I, dated 21st November, 1881 ). Eventually these proposals resolved themselves into a suggestion for the levying of a special rate in addition to the land revenue on the lines of the North-Western Provinces Act VIII of 1873.

The history of the enquiries made in Orissa for the purpose of deciding on the justice and expediency of such a tax are summed up as follows in a letter by Mr. Maude, the late Settlement Officer :—

* See also Paragraphs 56 to 63 and 72to78.

† See Revenue Report for 1897-98.

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History of enquiries down to 1892.

105. The last epoch of the history of the question of imposing an owner's rate on canal irrigated lands appears to have commenced from the date of a Minute of the Secretary of State in the year 1883, in which it was remarked with reference to certain irrigation reports of the Government of India in the Public Works Department, that no reference was made to the question of an owner's water rate, which it was said had been the subject of former correspondence with the Government of India.

It was further requested that the Secretary of State might be informed of the proceedings of the Government of India in this matter. The object of an owner's rate was at that time defined as the securing to the State of its shares of the higher rents which the landlords have, by reason of canal irrigation, been able to impose on the cultivators.

In letter No. 780 R., dated the 13th August, 1883, the Government of India called on the Bengal Government to consider the question with special reference to the temporarily-settled tracts of Orissa only, and at the same time recited some of the chief points in favour of and against the imposition of an owne'r rate, namely, on the one side the unremunerativeness, both at that time and as far as could be foreseen for some time to come, of the Orissa canal system was the fact that an owner's rate could be imposed at once, whereas an increased land revenue was barred until the year 1897, and on the other the probable discouragement of zamindars from inducing their raiyats to take canal and the possibility of the zamindars handing the onus of the rate on to the raiyats so as to make it result in a mere increase of water rate. It was fully recognised that the imposition of an owner's rate depended on the assumption that rents had largely risen owing to the canal works, and in support of this an opinion was quoted of the then Commissioner of Orissa to the effect that the rise in rents had been not less than Rs. 2-8-0 per acre on areas merely protected by canal embankments, letting alone any rise due to irrigation itself.

The conclusions of the enquiry which resulted from the revival of the question in 1883 are set forth in a report from the Comissioner to the Board of Revenue, dated the 21st June, 1884. The Commissioner was of opinion that there was no evidence to show either that the increase in rents had been greater in irrigated than in non-irrigated tracts, or that such increase as there had been was due to the canals. In support of the former statement he referred to the rise in rentals as shown by the latest road cess valuations. From examination of a number of villages of both classes (within and without the range of canals) it appeared that, in the irrigable villages, the rise in ten years had ranged from 5·8 to 17·4 per cent, while in the non-irrigable villages it had ranged from 12·9 to 17·8 per cent. In view of the above facts, it was decided that, before anything further was done, the question should be discussed by the Canals Commission, which was then about to sit to enquire into certain complaints as to the administration of the Orissa canals. The Commission was appointed in the same year, 1884 and took up this question among others. Their decisions, which are given in paragraphs 50-67 of their report, are summed up in a letter from the Government of India, No. 492 R., dated the 13th September, 1887. The Commission held briefly that the evidence of a rise of rentals due to the canals was not sufficiently clear or separable from that of a rise due to other causes to warrant the imposition of any general or proportionate owner's rate, and that the proper apportionment of such a rate upon lands where rents have directly risen from canal irrigation would be a difficult and probably unremunerative task. They believed also that the *pahi* or ordinary unprotected raiyats in Orissa were so depressed that any rate thus imposed on the landlords would be passed on to the tenants, and thus increase the unpopularity of irrigation. They did not recommend that Government should attempt to levy an owner's rate. They suggested as an alternative the imposition of an insurance rate against floods and droughts. The local Government did not, however, see its way to recommend even this alternative proposal. The Government of India did not consider the information on the subject to be complete, and enquired whether the agency of the Kanungos of the Province could not be utilised to check zamindars' papers, so as to afford reliable information as to the best means of levying canal revenue.

During the year 1888 personal enquiries on the above point were made both by the local officers and by the Director of Land Records. The result of the



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enquiries showed that it was hopeless to attempt to obtain correct returns by the agency of the patwaris and kanungos. The Director of Land Records accordingly suggested that in the coming Survey and Settlement operations, the irrigated parts should be first taken in hand and accurate data thus obtained on which a decision as to an owner's rate could be based. With this view, he suggested that a distinction should be made in the records between :—

(1) Lands brought under cultivation *entirely* owing to irrigation from canal.
(2) Lands which are only irrigated in years of drought and are therefore merely protected from a failure of crop.

The proposals of the Director of Land Records were recommended to the Government of India and were approved in that Government's letter No. 453 R., dated the 27th June, 1889. It does not appear, however, that they were ever reduced to any practical form in the records, although in a letter of the Bengal Government, No. 339 L. R., dated the 16th March, 1891, the following point among others was suggested as requiring statistical information :—

The effect of canal irrigation on the rent roll, and whether any increase due to irrigability has taken place which will justify Government in immediately putting an owner's rate on the landlord.

The instruction was subsequently followed by Government letter No. 1022 L. R., dated the 6th August, 1891, and by Government letter No. 282 L. R., dated the 26th July, 1892.

**Reports of 1892-95.**

As the result of these orders, long notes based on *a priori* reasoning were written by Messrs. Sen and Mitra, Assistant Settlement Officers, and a detailed enquiry was made by the former officer into the extension of rents and cultivation in the permanently-settled estate of Darpan on the High Level Canal.

In 1893, Messrs. Sen and Mitra were placed on special duty to complete the necessary enquiries, and they submitted reports, the former on 29 villages on the Kendrapara Canal System, the latter on 14 villages on the Taldanda-Machgaon System. These reports, together with an abstract of Mr. Sen's report on Darpan, were submitted to Government along with Mr. Maude's letter No. 2399 of the 16th November, 1893.

The Government of India were not however willing to accept this report as final, and in their letter No. 342-343 of the 29th January, 1895, laid down the broad lines on which the Settlement Officers should proceed in their future enquiries. These orders were elaborated by the Director of Land Records and Agriculture in his letter No. 2201 S., of the 24th July, 1895, and his instructions were approved by the Board of Revenue in their letter No. 842 A., of the 12th August, 1895.

In 1896 a report was submitted by Babu Sri Gopal Bhattacharji on the effect of irrigation in Balasore; but as he found only 10 villages in the District with a substantial area irrigated, the report did not add very much to our information.

**Report of 1896-99.**

Nothing further was done until after the conference in Cuttack of January 1897, when definite instructions were issued to all officers settling rents in the field, for the compilation of statistics of the lines laid down by the Director.

At the end of the year, reports were received from seven officers dealing with the figures for 320 irrigated and a number of unirrigated villages, situated on all the canals except the Machagaon and Jajpur extension.

The figures were abstracted in a note by Mr. Webster, but were not considered to afford, in themselves, sufficient material for a final report to the Government of India.

Since then, reports dealing with the revenue proposals for almost all Parganas in Cuttack have been received, and in all cases where lands are either protected or irrigated the effect of such irrigation and protection on rent rates and extension of cultivation forms the subject of one or more paragraphs of the report. Lastly, the large permanently-settled Parganas of Derabisi has been attested in order to add to our information as to the effect of irrigation in permanently-settled areas, and two reports embodying the results of this enquiry have recently been submitted to the Director.

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A preliminary report on the conclusion based on the reports for the settlement of revenue has also been submitted with this office letter No. 281 of 6th April, 1899 and forwarded to the Board of Revenue with letter No. 1764 S., of the 4th October, 1899 from the Director of Land Records.

106. The lines on which the present report should proceed are laid down in a note of the 8th December, 1898, by Mr. P C. Lyon, the Director of Land Records.

Lines of present Report.

In this note it was enjoined that the report should deal separately with permanently and temporarily-settled areas, and that answers to the following questions should, if possible, given for both :—

(1) Have rent rates risen in consequence of the facilities for irrigation ?
(2) Has cultivation extended to lands only culturable with the help of irrigation ?
(3) To what fresh areas will irrigation from canals now existing extend during the course of the Settlement ?
(4) Has the protection afforded by canal embankments (as distinguished from agricultural embankments)—
  (a) Raised rent rates ?
  (b) Brought new lands into cultivation, and to what extent ?
(5) To what extent has this protection improved collections ?

It is in the first place very difficult to observe the distinction here laid down between canals and canal embankments.

Difficulty of following these lines.

These embankments are said to protect from flood nearly 5 ½ lakhs of acres, while some 2 lakhs of acres are irrigated.

The lands of most villages and of the majority of tenants within this protected area comprise both irrigated and unirrigated lands, and the figures quoted by me must be understood to embody the results of protection accompanied by irrigation, though I shall endeavour to separate the results in the light of the criticisms of the local officers.

It appears to me that the first point to be considered is the extent to which Orissa stands in need of any artificial supply of water, and to this end I give here a short note on the rainfall. After reading this it will be easier to understand the variations in the area irrigated, and the uncertainty of the results.

Estimated value of irrigation to the country.

107. Orissa is primarily a land of abundant rainfall. The table annexed show that since 1860 the average registered fall for the year has been 62·02 inches on the whole, viz., 60·87 in Cuttack, 66.34 in Balasore, and 58.85 in Puri, and the only occasions on which it was less than 50 inches have been in Cuttack the years 1864,1869,1870,1876,1877 and 1885; in Balasore 1873 and 1879, and in Puri 1864, 1865, 1869, 1870,1876, 1877, 1885 and 1887.

Rainfall.

It will be seen that the deficiency is more frequent in Puri, which is also the only district in which the fall is occasionally less than 40 inches. It is not, however, by any means the case, that a little shortage in the rainfall must entail loss of crops. The most serious famine of the century was caused by failure of the September and October rains in 1865, and in spite of the very scanty fall of 1876 and 1877 the rains of September and October saved the crops. In 1896 with a rainfall of but little below the normal, serious loss was caused by the cessation of the rains early in September, the effect of this being much aggravated by high floods in the early part of the year and in August.

It is evident that well-distributed rainfall of 40 inches with not less than 4 inches* in October is sufficient to secure the crop, though for a bumper harvest at-least 50 inches with 8 inches in September and 6 inches in October is needed.

In the last 39 years the fall of October has been less than 4 inches fifteen times in Cuttack, twelve times in Balasore, and only six times in Puri: such failure is however most serious in this last district, which depends to a very great extent on the late rain. On the whole we may say that once in every four years the rainfall is less than the maximum compatible with ripening of the crop, and causes the loss of a fourth to a half of the rice in the unirrigated lands.

* See paragraph 429 of Famine Commissioner's Report of 1866.

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**Statement showing the rainfall in inches :—**

| Year. | CUTTACK. | | | BALASORE. | | | PURI. | | |
|---|---|---|---|---|---|---|---|---|---|
| | September. | October. | Total fall of the year. | September. | October. | Total fall of the year. | September. | October. | Total fall of the year. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1860 | 12·50 | 0·70 | 46·80 | 15.20 | 1·30 | 50·60 | 20·00 | 4·50 | 74·10 |
| 1861 | 15·68 | 4·56 | 76·28 | 7·40 | 4·70 | 76·50 | 14·10 | 6.10 | 73·00 |
| 1862 | 11·98 | 13·33 | 62·98 | 35·40 * | 29·30* | 111·90 | 16·60 | 42.20* | 136·10 |
| 1863 | 7·10 | 2·00 | 69·77 | 14·95 | 7·70 | 86·80 | 15·30 | 7·80 | 60·90 |
| 1864 | 8·90 | 2·60 | 48·70 | 7·90 | 6.10 | 64·80 | 8·60 | 6·20 | 42·20 |
| 1865 | 7·44 | .... | 51·40 | 9·30 | 0·30 | 52·60 | 5·20 | .... | 36·30 |
| 1866 | 2·60 | 11·85 | 60·95 | 10·50 | 8·55 | 68·25 | 12·10 | 11·10 | 77·20 |
| 1867 | 10·11 | 5·40 | 50·75 | 15·22 | 9·00 | 67·62 | 10·60 | 14·30 | 70·00 |
| 1868 | 9·80 | 1·96 | 52·81 | 9·60 | 0·40 | 77·00 | 5·05 | 0·30 | 50·97 |
| 1869 | 9·23 | 5·35 | 48·14 | 13·19 | 6·74 | 49·77 | 12·48 | 6·69 | 44·87 |
| 1870 | 8·80 | 8·61 | 49·92 | 11·46 | 7·69 | 54·77 | 6·58 | 10·95 | 43·44 |
| 1871 | 9·67 | 0·91 | 50·39 | 14·82 | 5·13 | 63·41 | 12·39 | 1·40 | 56·32 |
| 1872 | 8·76 | 16·16 | 71·16 | 13·97 | 11·97 | 71·29 | 7·04 | 16·19 | 75·14 |
| 1873 | 6·27 | 2·54 | 38·61 | 7·61 | 4·69 | 48·35 | 9·21 | 12·53 | 52·72 |
| 1874 | 12·13 | 10·71 | 86·74 | 7·60 | 12·03 | 55·19 | 4·87 | 9·62 | 61·78 |
| 1875 | 19·26 | 10·25 | 91·92 | 12·69 | 2·37 | 59·45 | 11·37 | 15·01 | 64·16 |
| 1876 | 9·83 | 4·89 | 41·28 | 15·95 | 10·32 | 82·72 | 9·61 | 6·64 | 34·93 |
| 1877 | 6·25 | 3·05 | 41·13 | 5·51 | 3·32 | 67·40 | 6·70 | 4·51 | 35·15 |
| 1878 | 6·40 | 4·92 | 54·57 | 7·90 | 8·59 | 61·89 | 13·56 | 14·08 | 54·66 |
| 1879 | 9·44 | 4·98 | 60·62 | 17·09 | 6·10 | 49·62 | 12·11 | 4·56 | 53·57 |
| 1880 | 10·29 | 5·17 | 67·06 | 11·63 | 5·28 | 74·33 | 15·14 | 10·63 | 87·58 |
| 1881 | 11·27 | 2·33 | 59·33 | 14·72 | 8·35 | 79·71 | 6·30 | 4·37 | 49·83 |
| 1882 | 11·86 | 7·64 | 75·96 | 21·69 | 10·10 | 79·02 | 7·54 | 7·95 | 43·93 |
| 1883 | 12·93 | 0·55 | 67·24 | 3·76 | 1·70 | 63·21 | 13·61 | 4·95 | 61·18 |
| 1884 | 8·68 | 2·40 | 59·42 | 13·57 | 4·48 | 76·24 | 15·10 | 17·13 | 65·01 |
| 1885 | 8·33 | 2·60 | 47·74 | 11·07 | 1·84 | 59·83 | 6·05 | 5·73 | 38·16 |
| 1886 | 13·99 | 11·77 | 79·70 | 17·82 | 5·65 | 73·96 | 14·78 | 6·14 | 56·55 |
| 1887 | 7·03 | 2·26 | 54·03 | 4·99 | 3·09 | 53·43 | 6·31 | 5·68 | 38·20 |
| 1888 | 8·81 | 1·34 | 56·93 | 12·32 | 1·64 | 59·34 | 7·89 | 1·66 | 44·22 |
| 1889 | 5·26 | 8·24 | 69·88 | 6·15 | 8·52 | 57·26 | 6·44 | 12·43 | 79·01 |
| 1890 | 17·53 | 7·39 | 65·31 | 18·68 | 10·16 | 66·57 | 14·77 | 10·61 | 72·02 |
| 1891 | 23·72 | 1·68 | 73·76 | 16·81 | 0·76 | 69·52 | 16·09 | 2·83 | 59·93 |
| 1892 | 10·35 | 7·39 | 50·34 | 11·40 | 7·93 | 55·24 | 8.34 | 5·87 | 46·57 |
| 1893 | 15·44 | 5·03 | 81·52 | 19·04 | 5·65 | 92·39 | 17·30 | 7·96 | 71·23 |
| 1894 | 6·45 | 7·76 | 60·82 | 6·86 | 4·70 | 61·69 | 7·54 | 7·50 | 52·38 |
| 1895 | 8·60 | 5·89 | 67·71 | 6·52 | 3·73 | 58·67 | 12·77 | 7·31 | 67·87 |
| 1896 | 9·49 | 0·03 | 58·52 | 10·59 | .... | 62·17 | 6·83 | 0·31 | 53·13 |
| 1897 | 7·89 | 8·92 | 63·82 | 5·90 | 14·13 | 65·05 | 7·45 | 10·12 | 55·12 |
| 1898 | 8·56 | 9·01 | 59·85 | 11·33 | 10·31 | 59·62 | 6·57 | 9·75 | 50·55 |
| Average | 10·22 | 5·44 | 60·87 | 12·26 | 6·56 | 66·34 | 10·52 | 8·55 | 58·85 |

Average of Orissa—Fall in September .... .... 11·00
Fall in October .... .... 6·85
Total fall of the year .... .... 62·02

* Cyclone.

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Extent of Irrigation.

108. The areas irrigated by the Orissa Canals from 1870 up to date are as follows. :—

| Year. | ORISSA PROJECT. | | | | | | |
|---|---|---|---|---|---|---|---|
| | Taldanda Canal and its branches. | Kendrapara Canal and its branches. | High Level Canal-Range I. | High Level Canal-Range II. | High Level Canal-Range III* | Jajpur Canal. | Total. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Acres. | Acres. | Acres. | Acres. | Acres. | Acres. | Acres. |
| 1869-70 | .... | 1,564 | 165 | .... | .... | .... | 1,729 |
| 1870-71 | 999 | 8,967 | 12,162 | .... | .... | .... | 22,128 |
| 1871-72 | 292 | 3,860 | 7,501 | .... | .... | .... | 11,653 |
| 1872-73 | 198 | 4,318 | 237 | .... | .... | .... | 4,753 |
| 1873-74 | 1,733 | 7,825 | 3,013 | .... | .... | .... | 12,571 |
| 1874-75 | 4,095 | 11,105 | 7,259 | .... | .... | .... | 22,459 |
| 1875-76 | 1,271 | 11,577 | 5,561 | .... | .... | .... | 18,409 |
| 1876-77 | 5,157 | 17,206 | 8,019 | .... | .... | .... | 30,382 |
| 1877-78 | 32,604 | 53,769 | 12,122 | .... | .... | .... | 98,495 |
| 1878-79 | 36,097 | 61,083 | 14,070 | .... | .... | .... | 111,250 |
| 1879-80 | 37,279 | 57,641 | 13,715 | 189 | 214 | .... | 109,038 |
| 1880-81 | 39,400 | 61,871 | 14,023 | 182 | 51,745 | .... | 117,221 |
| 1881-82 | 43,941 | 70,627 | 15,588 | 283 | 1,839 | .... | 132,278 |
| 1882-83 | 44,131 | 72,468 | 13,955 | 289 | 1,585 | .... | 133,028 |
| 1883-84 | 10,300 | 23,685 | 11,937 | 323 | 2,515 | .... | 48,760 |
| 1884-85 | 10,546 | 33,022 | 12,270 | .... | 3,104 | .... | 58,942 |
| 1885-86 | 15,489 | 36,375 | 13,404 | 265 | 6,806 | .... | 72,339 |
| 1886-87 | 18,685 | 39,714 | 12,412 | 407 | 6,491 | .... | 77,709 |
| 1887-88 | 31,277 | 54,404 | 15,312 | 994 | 7,569 | .... | 109,506 |
| 1888-89 | 40,391 | 72,796 | 18,092 | 2,385 | 25,628 | .... | 159,292 |
| 1889-90 | 40,246 | 77,874 | 26,599 | 2,563 | 39,345 | .... | 186,627 |
| 1890-91 | 41,806 | 74,970 | 21,984 | 2,503 | 39,036 | .... | 180,299 |
| 1891-92 | 41,906 | 74,180 | 22,423 | 2,513 | 36,211 | 452 | 177,685 |
| 1892-93 | 36,591 | 67,728 | 21,225 | 2,329 | 32,201 | 878 | 160,952 |
| 1893-94 | 12,054 | 61,259 | 10,491 | 2,052 | 15,802 | 1,868 | 103,526 |
| 1894-95 | 24,606 | 65,482 | 13,771 | 2,581 | 14,432 | 1,689 | 122,561 |
| 1895-96 | 25,672 | 63,936 | 3,859 | 892 | 10,105 | 4,996 | 119,460 |
| 1896-97† | 52,048 | 81,300 | 23,042 | 3,330 | 31,215 | 16,080 | 207,015 |
| 1897-98† | 50,304 | 75,811 | 22,052 | 3,243 | 29,193 | 14,999 | 185,602 |
| 1898-99† | 51,175 | 74,371 | 22,232 | 2,937 | 28,685 | 10,466 | 189,866 |

(*These figurs are given by the Public Works Department, the totals in column 8 are not in all cases correct.*)

To explain the variations from year to year is a very difficult task. When the canals were first opened the people hung back, being timid and averse from any innovation, and they were also afraid that irrigation would be made an excuse for the enhancement of rents and revenue. To allay their apprehensions a proclamation ‡ was published by Government in 1866, declaring the water rate to be wholly distinct from land revenue and promising that at the next revision of the Settlement no increased rate of assessment would be imposed on any lands by reason only of their being irrigated. These promises failed to produce much effect, and in 1877 they were withdrawn by the issue of a revised proclamation.§

A more effective inducement to take water was the gradual reduction of the rate from Rs. Rs. 3 per acre to Re. 1-8, a measure which was described by the lieutenant-Governor, Sir George Campbell, as resembling a Dutch auction.

The result of the reduction in the rate may be seen in the steady increase of irrigation up to 1874-75, but why there was a falling off more 1874-75 to 1878 is not clear. The quinquennial system of five-year leases at Re.1-8 and annual leases at Rs. 3 (and Rs. 2 for lift), and high prices and scarcity of water in 1878,

* In Balasore District.
† Figures for actual irrigation; in previous years the assessed areas are given.
‡ Notification 19th July, 1866.
§ See despatch No. 43 of 10th August, 1876 from the Secretary of state for India.



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the year of the Madras famine, account for the large area irrigated from 1878 to 1883. In the latter year most of the leases expired and were not renewed, so that there was a dropp from 1,33,028 to 48,766 acres. Various reasons are assigned for the objection of the people to execute the leases, but I cannot do better than quote the opinion arrived at by the Commissioners appointed to enquire into the abuses of irrigation in 1884* :—

"In Orissa the normal rainfall being ample, the value of canal irrigation is exceptionally dependent on the character of the season. Cultivators frequently allege that they were in the first instance partly induced to take water leases by assurances of increased outturn, which have not been fulfilled; but in the opinion of many and certainly in that of the Uriya peasant, the chief value of canal water lies not in any improvement which it may render possible in the outturn of an ordinary year, but in the protection which it affords against total or partial failure in years of drought. In the case of these high lands which cannot grow a late rice crop without canal water, these remarks do not apply."

"This being so, it is but natural that when water leases expire the cultivators should be disposed to put off renewing their engagements till a period of drought occurs; and when the hour of need does come there is a sore temptation to take water, without leasing, from neighbouring leased fields or other available sources, and so to avoid the necessity of paying Rs. 3 per acre for a single year or engaging for a period of five years is order to secure the lower rate of Re. 1-8. When a small number of leases expire the difficulties arising from this tendency can be more or less readily met; but in Orissa, with the year 1882-83 the so-called five-year leases all expired together, and that under circumstances tending to increase the usual reluctance to renew. In three out of the preceding five years the rainfall had been sufficient and timely, and consequently the benefit derived from canal irrigation had been comparatively small."

Cultivators, penny wise and pound foolish as they are, soon began to realise that the loss of their crops from drought more than counterbalanced the saving of the water rate; the area slowly rose, and with the next quinquennial period a much large number of leases were executed and the maximum of 1,86,627 acres was reached in 1889-90. A few years of abundant and excessive rainfall brought the irrigated area down to 1,19,460 acres in 1896, when the drought of September to November created an universal demand for water and the irrigated area rose at a bound to 1,82,029 acres, and in the Irrigation Returns of 1897-98 is shown as 1,92,676 acres † out of a total irrigable area of 3,03,750 acres. In the following year there was a falling off in the area irrigated, due to less irrigation of ***rabi*** and ***dalua*** on the High Level and Jajpur canals. This is accounted for by the success of the ***sarad*** crop, which sufficed to support the cultivators in idleness through the cold and hot seasons.

The difference between leased, assessed, and irrigated areas is shown in the following table for 1898-99 :—

| | Leased. Acres. | Assessed. Acres. | Irrigated. Acres. |
|---|---|---|---|
| Long leases .... | 1 91,019 | 1,86,058 | |
| Season leases-Sugarcane .... | 624 | 624 | |
| Autumn rice .... | 113 | 113 | |
| ***Rabi*** and ***dalua*** .... | 5,122 | 5,054 | |
| Total .... | 1,96,878 | 1,91,849 | 1,89,866 |

The irrigated area excludes fields for which leases were executed, but to which water could not be, or was not, supplied. The assessed area excludes also ***chaukidar jagirs***, to which water was supplied free of charge.

In the Settlement records the total area recorded as leased for irrigation is in Cuttack 1,37,888 acres, and in Balasore 28,856, a total of 1,56, 744 acres. The discrepancy is due partly to the exclusion of a large irrigated area in Darpan and partly to the fact that some of the Settlement figures are for the years 1895-96, some for 1896-97, and some for 1897-98, and that during every year the irrigated area has been rapidly increasing. It is likely to continue to increase until 1901-1902 when many leases fall in, and their immediate renewal will depend to some extent on the character on the season.

* Report; paragraphs 4 and 5.
† This is assessed area, which is less than the leased area shown above.

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Increase in productive power of land due to irrigation.

109. Enquiries into the comparative outturn of rice on wet and dry lands have been carried on for many years past. Mr. Boothby and Mr. Shore, of the Irrigation Company, estimated the yield of clean rice from irrigated land at 1,200 lbs per acre, or nearly double that from the unirrigated. These estimates were based on the results in the Godaveri delta, and were hardly applicable to Orissa. In 1872 Colonel Haig, one of the most eminent engineers who have made a study of the Orissa canal System, estimated the average yield of the year on well irrigated light soils at 25 to 29 maunds of paddy per acre, while that of similar unirrigated lands was from 12½ to 14 maunds only. He also found the raiyats admit that on lower and stiffer soils irrigation, even in a year of heavy rainfall, would have raised the outturn from 27½ to 32½ maunds, because in the first place the crop would have been planted earlier and have been strong enough to withstand the heavy rain of June; and secondly, because the silty canal water would have enriched the soil.

Again, Mr. Wylly, the Canal Revenue Superintendent, gave the following abstract of his experiments; the figures are somewhat obscured by the nature of the year, crops on the lowest and best lands having suffered from excess of rain.

| Place. | Class of land. | | Irrigated. Mds. | Srs. | Unirrigated. Mds. | Srs. |
|---|---|---|---|---|---|---|
| High leval canal. | First Class | Highest | 18 | 0 | 17 | 0 |
| | | Lowest | 11 | 24 | 8 | 0 |
| | Second Class | Highest | 13 | 8 | 9 | 24 |
| | | Lowest | 12 | 8 | 7 | 28 |
| | Third Class | Highest | 8 | 12 | 6 | 25 |
| | | Lowest | 8 | 4 | 5 | 28 |
| Taldanda canal | First Class | ,, | 36 | 0 | 32 | 0 |
| | Second Class | ,, | 35 | 16 | 19 | 8 |
| | Third Class | ,, | 21 | 0 | 11 | 8 |
| Kendrapara. | First Class | Highest | 25 | 24 | 20 | 22 |
| | | Lowest | 18 | 13 | 11 | 0 |
| | Second Class | Highest | 37 | 32 | 24 | 0 |
| | | Lowest | 21 | 21 | 18 | 0 |
| | Third Class | Highest | 34 | 32 | 28 | 0 (a) |
| | | Lowest | 13 | 37 | 12 | 24 |

The results are expressed in standard maunds of paddy.
(a) Doubtful.

In Colonel Haig's note of 1877 * he gives as the result of 783 experiments in 1878-79 the increased value of the paddy on irrigated land at Rs. 16-4-9 the equivalent of 15·69 maunds of grain. In the Mahanadi Division the difference in yield was 9·75 maunds of paddy, and in the next year the avarage difference was put down at 6·13 maunds of paddy.

The Irrigation Committee † of 1884, basing their opinions on the experiments of 1877 to 1884, assumed the difference between the outturn of wet and dry, *i. e.*, unirrigated, land to be 5 maunds per acre, but were at the same time careful to guard themselves against generalising for the entire Province even on the large number of experiments before them.

It remains to see how far these conclusions are borne out by more recent enquiries.

In the decennial period of 1885-86 to 1896-97 the results of 428 experiments by officers of the Irrigation Department was to give an average yield for irrigated lands of 19·72 maunds of paddy and 28·17 maunds of straw, against an average for the unirrigated lands of 15·59 maunds of paddy and 22·02 maunds of straw. In the provisional estimate of the outturn of winter rice per acre submitted to the Government of India in 1898 ‡ the average yield of clean rice per acre was taken at 1,045 lbs. for irrigated and 902 lbs. for unirrigated lands. For the four years 1895 to 1899 the average of the experiments made by officers of the Collectorate

* No. 1028 I. of 21st March 1897, Colonel F. T. Haig, Joint Secretary to the Government of Bengal, in Public Works Department, to the Commissioner of Orissa, paragraph 34.
† Paragraph 41 of Report.
‡ Director of Land Records and Agriculture to Government, No. 356 A dated 3rd March, 1898.

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and Settlement staff gave an average for irrigated land of 1, 996 lbs. of paddy, and for unirrigated of 2,003 lbs. per acre.

It remains to be considered what the equivalent of paddy is in cleaned rice. This depends a good deal on how dry the paddy was when weighed. In Orissa it is the custom to give out the paddy in contract, the agreement being that for every 25 *gownis* of paddy 10 to 12 *gownis* of dry rice are returned. This rice, however, has a far greater specific gravity than the paddy, and in fact more that half weight is returned. The Irrigation Department have taken the weight of rice at two-thirds of that of the paddy, and in some experiments made by Babu Jamini Mohan Dass and Mr. Maude this weight was actually obtained; but as a rule, allowing for the paddy being slightly damp when weighed, I think five-eights a safer proportion to take.

Thus we get as the result of those three sets of experiments last quoted :—

| | Weight of cleaned Rice per acre | |
|---|---|---|
| | Irrigated. lbs. | Unirrigated. lbs. |
| Experiments of Irrigation Department, 1985-96 .... .... | 1,014 | 802 |
| Estimate sent to Government of India by the Director of the Department of Land Records and Agriculture, Bengal .... .... | 1,045 | 902 |
| Civil Experiments of 1995-98 .... | 1247 | 1252 |
| Average .... .... | 1,102 | 985 |

The figures for the irrigated area in the first two sets of experiments are lower than those given in the earlier experiments of 1878-84, and I think that in the years 1885 to 1890 there must have been some confusion between weights of rice and paddy. On the whole we may, I think, assume the out-turn at 13½ maunds or 1,110 lbs. for irrigated, and 12 maunds or 986 lbs. for unirrigated. The difference, 103 lbs., is worth at the average price of the last ten years, which is 18.23 seers to the rupee, about Rs. 3-4. Add to this the difference in the straw, about 28 maunds per acre in the irrigated and 22 to 23 maunds in uuirrigated fields and we get the additional value of the produce of irrigated fields at Rs. 4 in the case of *sarad* rice.

The much greater difference between the yield of irrigated and non-irrigated lands given in the estimates made by the Public Works Department as compared with the experiments made by other Departments may be put down to the fact that the former generally make their cuttings in an area where all the best lands are irrigated and where the exclusion of river silt, and systematic drainage have made an artificial supply of water most necessary. Outside this area the heaviest crops of all are those raised on lands rich in river silt; and in ordinary years the average outturn is not very much less than in the irrigated country. There is, however, a further correction to be made. The Commissioners appointed to enquire into certain abuses connected with the Orissa canals estimated the average annual loss from drought at one-twelfth of the crop; and that from floods at one-tenth.* Taking the minimum rainfall compatible with a successful harvest at 4 inches in October,† we find that in the thirtynine years from 1860 to 1898 the fall in October fell short of this amount fifteen times in Cuttack, twelve times in Balasore, and six times in Puri, or an average of eleven times in thirty-nine years. We may assume roughly that once in four years a third of the crop will be killed by drought thus entailing a loss to the cultivator of not less than one-twelfth of the crop, or Rs. 3 per acre per annum on an average, equal to Rs. 6,00,000 on the whole irrigated area. The saving of loss from floods is not I think to be credited against the cost of irrigation, but it may, perhaps, be credited to canal embankments, and may be put at the value of Rs. 5,00,000 $\times \frac{1}{10}$ maunds, or about 13 lakhs of ruppees per annum.

The total value to the cultivator of the *kharif* irrigation thus estimated is Rs. 4 per acre per annum, or about Rs. 7,40,000 for the Province, besides another Rs. 6,00,000 which may be credited to insurance against drought.

* Report, paragraph 42 and 62.
† See Paragraph 107.

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I have not said anything about the facilities for growing a second crop on the land afforded by the copious supply of water, for against it may be set off the loss of *rabi* crops formerly grown on the silt-covered lands. Besides the *sarad* crop some 7,000 acres of *rabi* and *dalua* rice and perhaps 1,000 acres of sugarcane are irrigated; to both of these crops the water is of great value, and, indeed, they would often not be grown at all without it, but have no sufficient material for estimating the effect of irrigation on the outturn. I think we should be safe in estimating the value to sugarcane at not less than Rs.15, and that to *rabi* at not less than Rs. 5 per acre; this would raise the total value to the Province of the canal water to Rs. 7,90,000, exclusive of the insurance.

**Water rates.**

110. The rates in force are as follows :—

| | Per acre. Rs. A. P. |
|---|---|
| Long leases (five years) for *kharif*— | |
| Flow .... .... .... .... | 1 8 0 |
| Lift .... .... .... .... | 1 0 0 |
| Water-logged land .... .... | 0 8 0 |
| Perennial crops (chiefly sugarcane)— | |
| Flow .... .... .... .... | 6 0 0 |
| Lift .... .... .... .... | 4 0 0 |
| *Rabi*— | |
| Flow .... .... .... .... | 0 8 0 to 2 0 0 |
| Lift .... .... .... .... | 0 5 0 to 1 8 0 |

More than nine-tenths of the irrigated area is under long lease, and half of the sugarcane is said to be irrigated without extra charge. The total water rates for 1897-98 were mearly Rs. 3,15,000, which being deducted from Rs. 7,90,000 the estimated increased value of the harvest leaves a profit of Rs. 4,75,000.

**Effect of irrigation on rent rates in temporarily-settled areas.**

111. The next question to be answered is, who ultimately gets the advantage of this increased value ? Does the cultivator retain it all, or does the zamindar and therefore Government obtain a share ? Amidst the mass of conflicting information on the subject of the increase of rent rates one fact alone can be held to be abundantly proved, and that is that the cases in which a zamindar has openly enhanced rents on the ground of the accessibility of canal water, or has imposed an irrigation cess of his own are very rare. I have heard of a few such cases, as in Taluk Raghunathpur of Kodinda, but they are certainly the exception, and I do not think that it is unreasonable to attribute this in some measure to the proclamation of 1866 to which the widest publicity must have been given.

At any rate the result is to reduce us to seek in a comparison of rates in different local areas and at different periods for circumstantial evidence.

The first figure to which we should naturally look is the incidence per acre of the rents of raiyats whose rents were liable to enhancement during the term of settlement, and it may be confidently assumed that the rents of the *pahi* raiyats of Orissa are so far competition rents that they would ordinarily be enhanced by the zamindars if there was any very decided improvement in the value of the land. I have therefore prepared the following table, placing oppsite to one another irrigated and unirrigated areas which I considered fairly comparable, and have added explanatory remarks showing the factors which appear to have conduced to the differentiation of rents.

I have added the rate *thani* rents of the last Settlement as showing what was then the high-water mark of assessment, and have prepared an explanatory map showing approximately the irrigated, protected, and flooded areas and the incidence of *pahi* rents in each.



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| PARGANA. | Percentage of area irrigated. | LAST SETTLEMENT INCIDENCE PER ACRE. Pani rents. | | | Thani rents. | | | Mafasal Jama. | | | PRESENT SETTLEMENT. Settled and occupancy | | | Mafsal Jama | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | | | 4 | | | 5 | | | 6 | | | 7 | | | 8 |
| | | Rs. | A. | P. | Rs. | A. | P. | Rs. | A. | P. | Rs. | A. | P. | Rs. | A. | P. | |
| Asureswar.... | 35 | 2 | 5 | 6 | 3 | 12 | 6 | 2 | 2 | 4 | 3 | 4 | 8 | 2 | 14 | 4 | Group A.—Irrigated Parganas on the Kendrapara System. |
| Sungra .... | 51 | 2 | 7 | 9 | 3 | 14 | 2 | 2 | 8 | 4 | 3 | 6 | 2 | 3 | 2 | 4 | |
| Matkatnagar | 38 | 2 | 10 | 5 | 3 | 14 | 1 | 2 | 5 | 8 | 3 | 11 | 3 | 3 | 4 | 2 | |
| Nahakhand | 15 | 2 | 0 | 5 | 3 | 6 | 3 | 2 | 7 | 5 | 3 | 3 | 5 | 2 | 15 | 8 | |
| Balubisi ... | 5 | 2 | 8 | 11 | 4 | 1 | 4 | 2 | 6 | 7 | 3 | 10 | 4 | 3 | 3 | 1 | Group B.—Unirrigated and mostly unprotected parganas on the north of the Mahanadi. |
| Suknai ... | 1 | 2 | 3 | 8 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 5 | 7 | 3 | 0 | 4 | |
| Abartak .... | .... | 3 | 2 | 9 | 4 | 13 | 0 | 3 | 0 | 5 | 4 | 0 | 11 | 3 | 10 | 9 | |
| Kusmandal | .... | 2 | 13 | 10 | 3 | 11 | 10 | 2 | 12 | 9 | 3 | 2 | 0 | 2 | 14 | 8 | |
| Paina .... | .... | 2 | 7 | 6 | 3 | 8 | 2 | 2 | 6 | 10 | 3 | 0 | 8 | 2 | 13 | 7 | |
| Padampur .... | 46 | 2 | 6 | 2 | 2 | 14 | 8 | 2 | 4 | 9 | 2 | 15 | 6 | 2 | 11 | 5 | Group C.—Irrigated parganas on the Kendrapara Canal System. |
| Saraswati ... | 53 | 2 | 7 | 9 | 3 | 6 | 2 | 2 | 6 | 0 | 3 | 8 | 1 | 3 | 3 | 0 | |
| Karimul .... | 56 | 2 | 0 | 1 | 2 | 12 | 11 | 1 | 14 | 10 | 2 | 15 | 9 | 2 | 10 | 10 | |
| Suhang .... | .... | 2 | 0 | 9 | 3 | 6 | 1 | 2 | 0 | 11 | 3 | 0 | 11 | 2 | 10 | 11 | Group D.—Inundated parganas at the head of Mahanadi. |
| Painda .... | 4 | 1 | 14 | 11 | 2 | 15 | 6 | 1 | 9 | 11 | 3 | 1 | 5 | 2 | 6 | 3 | |
| Kodinda .... | 18 | 2 | 4 | 10 | 3 | 0 | 8 | 2 | 3 | 7 | 2 | 15 | 8 | 2 | 10 | 5 | Group E.—Irrigated parganas on the Taldanda Machgaon System. |
| Hariharpur | 54 | 1 | 15 | 11 | 2 | 15 | 10 | 1 | 10 | 1 | 3 | 4 | 11 | 2 | 10 | 1 | |
| Jhankar .... | 47 | 2 | 7 | 3 | 3 | 7 | 0 | 2 | 6 | 4 | 3 | 0 | 9 | 2 | 12 | 0 | |
| Kurania .... | 11 | 1 | 15 | 3 | 2 | 9 | 8 | 1 | 9 | 11 | 3 | 3 | 3 | 2 | 9 | 4 | |
| Khandi .... | 21 | 2 | 7 | 11 | 3 | 13 | 0 | 2 | 4 | 6 | 3 | 6 | 9 | 2 | 14 | 1 | |
| Gandito .... | 34 | 2 | 1 | 2 | 3 | 3 | 6 | 1 | 11 | 5 | 3 | 4 | 3 | 2 | 8 | 1 | |
| Deogaon .... | ? | 1 | 15 | 5 | 3 | 8 | 3 | 2 | 0 | 10 | 2 | 6 | 8 | 2 | 4 | 7 | Group F.—Unirrigated and partially-Irrigated parganas on the Katjuri river. |
| Kate .... | 2 | 1 | 13 | 0 | 2 | 1 | 0 | 1 | 11 | 3 | 2 | 6 | 2 | 2 | 2 | 1 | |
| Saibir .... | 14 | 2 | 12 | 10 | 3 | 8 | 9 | 2 | 8 | 4 | 3 | 0 | 1 | 2 | 12 | 7 | |
| Benahar .... | 11 | 1 | 6 | 11 | 2 | 7 | 8 | 1 | 3 | 4 | 2 | 13 | 11 | 2 | 8 | 10 | |
| Tiran .... | 2 | 2 | 4 | 1 | 3 | 3 | 10 | 2 | 13 | 0 | 2 | 4 | 3 | 2 | 12 | | |
| Sailo ... | Nil | 1 | 12 | 6 | 2 | 10 | 3 | 1 | 13 | 11 | 2 | 2 | 11 | 2 | 1 | 1 | |
| Kokhuakhand | 57 | 2 | 4 | 3 | 3 | 9 | 6 | 2 | 2 | 8 | 3 | 2 | 2 | 2 | 14 | 0 | Group G.—Irrigated tracts on high level canal. |
| Kerualkhand | 26 | 3 | 1 | 1 | 4 | 5 | 10 | 2 | 12 | 0 | 3 | 6 | 2 | 3 | 1 | 11 | |
| Kanchikhand | 79 | 1 | 14 | 11 | 3 | 7 | 3 | 1 | 15 | 10 | 2 | 15 | 6 | 2 | 11 | 9 | |
| Kuhunda-Jaipur | 4 | 1 | 8 | 3 | 3 | 2 | 2 | 2 | 1 | 5 | 2 | 15 | 11 | 2 | 10 | 7 | Group H.—Unprotected or partly-protected parganas on Birupa. |
| Alti .... | 9 | 1 | 15 | 10 | 2 | 15 | 1 | 1 | 14 | 9 | 3 | 4 | 3 | 2 | 14 | 3 | |
| Dihi Arakh-pur | 1 | 3 | 8 | 2 | 3 | 1 | 7 | 2 | 15 | 9 | 3 | 6 | 6 | 2 | 15 | 4 | |
| Bargaon .... | Nil | 1 | 11 | 11 | 2 | 6 | 4 | 1 | 14 | 2 | 1 | 14 | 4 | 1 | 14 | 1 | |
| Jaipur .... | 23 | 1 | 14 | 7 | 2 | 8 | 0 | 1 | 10 | 11 | 2 | 14 | 1 | 2 | 9 | 6 | Group I.—Irrigated parganas on the Jajpur Canal. |
| Dolegram .... | 46 | 1 | 8 | 3 | 2 | 4 | 9 | 1 | 4 | 7 | 2 | 10 | 11 | 2 | 8 | 9 | |
| Tisania .... | 10 | 1 | 12 | 9 | 2 | 3 | 5 | 1 | 7 | 3 | 2 | 14 | 2 | 2 | 5 | 2 | |
| Katia .... | 4 | 1 | 10 | 5 | 2 | 10 | 1 | 1 | 9 | 0 | 2 | 12 | 0 | 2 | 5 | 0 | |
| Olas .... | 1 | 2 | 5 | 0 | 2 | 15 | 8 | 1 | 12 | 0 | 2 | 11 | 2 | 2 | 6 | 8 | Group J.—Unprotected parganas on the Brahmani-Kharsua System. |
| Beruan .... | 1 | 2 | 4 | 8 | 2 | 13 | 7 | 2 | 0 | 7 | 2 | 12 | 0 | 2 | 7 | 8 | |
| Kalamatia .... | .... | 1 | 9 | 11 | 2 | 6 | 4 | 1 | 10 | 4 | 2 | 6 | 4 | 2 | 4 | 7 | |
| Hatimunda | .... | 1 | 7 | 3 | 3 | 1 | 3 | 1 | 9 | 1 | 2 | 15 | 8 | 2 | 9 | 9 | |
| Jodh .... | 15 | 1 | 13 | 91 | 2 | 7 | 4 | 1 | 8 | 9 | 3 | 2 | 2 | 2 | 12 | 0 | |
| Tikan .... | 11 | 1 | 4 | 5 | 2 | 7 | 10 | 1 | 5 | 6 | 3 | 4 | 0 | 2 | 11 | 8 | Group K.—Irrigated Parganas on Gobari and Patamundai Canal. |
| Chaudakulat | 29 | 1 | 11 | 6 | 2 | 14 | 7 | 1 | 15 | 3 | 3 | 6 | 7 | 3 | 3 | 1 | |
| Ahyas .... | 8 | 1 | 11 | 0 | 2 | 8 | 5 | 1 | 8 | 2 | 2 | 5 | 1 | 2 | 0 | 2 | |
| Bautara .... | 2 | 1 | 2 | 0 | 3 | 2 | 11 | 1 | 0 | 1 | 1 | 11 | 10 | 1 | 9 | 0 | Group L.—Unprotected areas in the Baitarni Kharsua Delta. |
| Bara .... | .... | 0 | 13 | 8 | 1 | 9 | 5 | 0 | 14 | 3 | 1 | 9 | 6 | 1 | 5 | 9 | |
| Kaima .... | 1 | 1 | 14 | 6 | 1 | 12 | 10 | 1 | 3 | 8 | 1 | 9 | 4 | 1 | 7 | 7 | |

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Groups A and B are fairly comparable, or perhaps more correctly the first three parganas of Group A should be compared with Balubisi, Kusmandal, and Suknai, and Nahakhand with the other two.

Group A. Group A contains some of the Parganas that have been longest and most completely irrigated; they have also been drained, and canal water is now indispensable to their cultivation. At the last Settlement they were partly protected from inundation and were thickly populated and prosperous tracts. The mean incidence of their *pahi* assessment was Rs. 2-6, and of the *thani*, Rs. 3-12 per acre. The mean incidence of occupancy raiyats' rents has now risen to Rs. 3-6 per acre, an increase of Re. 1 per acre.

Babu J. N. Mitra, reporting on Asureswar, found no evidence of rise of rent rates directly due to irrigation, and considered that the protection had been of more value than the canal water. In Matkatnagar Babu N. C. Kar, while not finding any direct evidence of enhancement, was of opinion that but for irrigation so high a rate could not be paid. This is doubtless true, though at the last settlement *thani* raiyats were paying a higher average of rents than *pahi* tenants do even now. In Nahakhand the assessing officer, Babu Hira Lal Banerjee, wrote :—"There is not much reason to suppose that the rent rates have risen in consequence of canal irrigation. I consider, however, that it has benefited the zamindar by enabling him to bring lands under cultivation and by securing the crops from the bad effects of deficient rainfall."

The fact appears to be that this part of the country was already prosperous and highly assessed, and while some benefit has undoubtedly been caused, it is rather by insurance against loss than by direct enhancement of the productive power of the land, and this will be borne out by an examination of the figures of Group B.

Group B. These latter villages lie between the Mahanadi and the Kendrapara Canal. Only a small portion of them is irrigated, but they are, to a great extent, protected against ordinary floods, and it is only the lower end of Suknai and part of Paina that suffer seriously from inundation. They contained the homes of many well-to-do persons, and were at the last Settlement even more highly assessed than Group A. The mean incidence per acre of *pahi* rents has risen from Rs. 2-10 to Rs. 3-7, or by As. 13 as against an increase of Re. 1 in Block A. Considering that besides irrigation and protection, Block A enjoys far greater advantages in the form of roads, post offices, and communications generally, there is very little ground for attributing much of the increase in Block A to irrigation.

Further, in Balubisi itself, the southern half is protected and irrigated, the northern exposed to the floods of the Mahanadi and Nuna rivers. The extension of cultivation and increase of rent rates in the irrigated and unirrigated area are compared in the following table :—

| | Percentage of increase of cultivation. | Incidence or *thani* rents. | | Incidence or *pahi* rents. | |
|---|---|---|---|---|---|
| | | Last settlement | Present settlement. | Last settlement | Present settlement. |
| Balubisi I. (48 unprotected estates). | 66 | 4·8 | 4·8 | 3·3 | 3·8 |
| Balubisi II. (unprotected) | 8 | 3·14 | 3·1 | 2·12 | 3·2 |
| Balubisi II. (Irrigated) | 22 | 3·9 | 3·6 | 2·4 | 3·0 |

The increase of cultivation and of rent rates is greater in the irrigated than in the immediately adjoining unirrigated villages, but the rents are lower; while in the unprotected villages, a little further north, there has been a still greater extension of cultivation and rents are much higher.

There is nothing to show that irrigation has caused any great rise of rent rates or extension of cultivation, though it has affected, to some extent, the nature and number of the crops grown on the irrigated areas.

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Group C.

The third group consists of Parganas, which at the last Settlement, through favourably situated close to Cuttack were liable to flood. They are now, for the most part, protected and irrigable. There condition has been greatly improved and the mean incidence of the *pahi* assessment has arisen from Rs. 2-5 to over Rs. 3-2 per acre or to a little more than the mean incidence of *thani* rents at the last Settlement.

In Saraswati the assessing officer, Babu Hira Lal Banerjee, reported that the incidence of rents varied generally according to the proportion of irrigated land and in Padampur Mr. Carey found evidence of a very marked rise in rents since the introduction of irrigation. He compiled the following figures for seven selected villages :—

| | 1276 U., corresponding to 1869 A. D. | 1281 U., corresponding to 1874 A. D. |
|---|---|---|
| | Acres. | Acres. |
| Total *pahi* area .... .... .... | 543 | 558 |
| | Rs. A. P. | Rs. A. P. |
| Total *pahi* rent .... .... .... | 1,708-0 0 | 1,825-0 0 |
| Incidence per acre .... .... .... | 3 2 4 | 3 4 4 |

This shows a considerable enhacement of rents at the time when water was first introduced, but it is not said whether any distinction was then made between wet and dry lands.

Group D.

The Parganas of Suhang and Paenda are, like those last mentioned, situated in the forks of branches of the Mahanadi, but unlike them, instead of being protected by embankments, form part of the spill area. Nevertheless, and inspite of their comparative inaccessibility, the mean incidence of *pahi* rents has risen from Rs. 2 to Rs. 3-1 per acre. That is more than in the comparable irrigated Group C.

Group E.

In the group marked E, I have included all the principal Parganas between the Machgaon and Taldanda Canals, omitting onl yBenahar and Tiran, to which distributaries have so recently been extended that it is out of the question that irrigation should have much, if at all, affected rents. These Parganas were, at the last Settlement, partly protected but suffered much for want of roads. Now they are protected and irrigated, and have a better system of roads than almost any other part of Cuttack, to say nothing of the facilities for transport offered by the canal.

The mean *pahi* assessment on this block shows an increase from Rs. 2-3 to Rs. 3-3 per acre. *Thani* rents at the last Settlement averaged Rs. 3-3 per acre.

In Kodinda rents are slightly lower than in the other Parganas, because some villages are still unprotected and unirrigated and others have suffered from heavy deposits of sand due to the breaching of embankments from thirty to forty years ago. It is really in this Pargana that we find the clearest indication of rents having been raised by irrigation; and though the papers of the estate do not show it, it is said that in Taluk Raghunathpur some of the enhancements were in fact made openly on the ground of the introduction of canal water. Soil maps were prepared for this area and they showed that though some attempt had been made to readjust rents according to the altered classification of soils brought about by irrigation, still rents were far from being proportionate to the relative productive power of the best and worst lands.

In Hariharpur also more figures were available than in most parts, and very careful enquiries were made. The people themselves asserted that the injury due to the drainage cuts taken with the water rates more than swallowed up the whole profit of the increased outturn. This is manifestly untrue, but no enhancements of rent rates on account of irrigation could be found, and Mr. Carey, after an examination of the information collected, summed up the result in the following terms :—"I think we must consider the chief benefit of irrigation in this Pargana to be security from drought when the rain fails".

Much the same results were arrived at in Gandito and Kurania and Jhankar. In Khandi, formerly a remote and wild tract, there has been the most marked increase, but it is to be attributed more to protection and to improved communication than to irrigation. To sum up, while rents have risen largely in

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this block, the reporting officers have failed to find any direct evidence of enhancements on account of irrigation. I am, however, satisfied that though protection and improved roads may account for most of the increase, some share in it must, at least in Hariharpur, Kurania and Kodinda, be attributed to irrigation.

**Group F.**

To the right and at the end of the Machgaon Canal lie the Parganas of Group F. The first three are all partly protected and irrigated, but the irrigation is of so recent a date that it has as yet had no effect upon rents, and the bulk of this area is more heavily flooded than formerly owing to the restriction of the spill area by the canal embankments. The flooded area is, however, rather a *rabi* than a rice-growing tract, and comprises the poorest as well as the richest soils in the district.

On the group the mean incidence of *pahi* rents has risen from Rs. 2 to Rs. 2-11, while the mean of the *thani* rents at the last Settlement was Rs. 2-15.

As I have said, Kate and Saibir both contain a protected as well as an unprotected area, and in both there can be little doubt but that the construction of the canal embankment ( the Daib left ) has greatly benefited the protected at the expense of the unprotected area, though there is no evidence of an increase of rates of rent in either. The following figures bear out this conclusion :—

Pargana Kate —

| | At last Settlement. | At present Settlement. |
|---|---|---|
| | Acres. | Acres. |
| Cultivated area— | | |
| Protected .... .... | 1,447 | 2,219 |
| Unprotected .... .... | 1,697 | 3,091 |
| | Rs. A. P. | Rs. A. P. |
| Incidence of *thani* rents per acre— | | |
| Protected .... .... | 2 10 0 | 2 8 0 |
| Unprotected .... .... | 3 7 0 | 2 3 0 |
| Incidence of *pahi* rents per acre— | | |
| Protected .... .... | 1 13 0 | 2 5 0 |
| Unprotected .... .... | 2 9 0 | 2 1 0 |

Pargana Saibir—

| | Protected area. | Unprotected area. |
|---|---|---|
| | Per cent. | Per cent. |
| Proportion of the waste lands at the Settlement reclaimed up to now. | 56·53 | 51·98 |
| .... | Acre. | Acre. |
| Average size of a plot .... | ·25 | ·34 |
| | Acres. | Acres. |
| Average size of a holding | 1·37 | 1·68 |
| | Rs. A. P. | Rs. A. P. |
| Average selling-price of land per acre during the past ten years— | | |
| (a) *Lakhiraj Bahal* .... .... | 132 6 4 | 97 8 0 |
| (b) *Bazyafti* .... .... .... | 98 10 5 | 80 1 10 |
| (c) *Thani* .... .... .... .... | 41 3 9 | 40 4 6 |

| | Assessed area. Acres Protected. | Rent. Rs. A. | Incidence. Rs. A. | Assessed area Acres Unprotected. | Rent. Rs. A. | Incidence. Rs. A. |
|---|---|---|---|---|---|---|
| Development of rents (including *lakhiraj bazyafti* and lands held by proprietors)— | | | | | | |
| At last Settlemet | 4,568·56 | 14,238 2 | 3 2 | 2,530·45 | 8,116 0 | 3 3 |
| As now settled | 7,047·58 | 22,671 7 | 3 3 | 4,847·23 | 13,820 12 | 2 13 |

Sailo is a Pargana in which more valuable crops were grown before the construction of the protective embankments, and that is the reason for the comparatively low retes and small increase.



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Tiran and Benahar are partly protected and irrigated, but irrigation is too recent to have affected rents, and a considerable area in both is liable to inundation by the drainage cuts and the brackish water of the tidal creeks.

On the whole, it may be said that rents have risen more in Group E than in Group F, and though the difference is due rather to protection, to accessibility, and to the quality of the soil, than to irrigation, yet some credit for it must be allowed to the facilities for obtaining canal water.

Group G.

On the left bank of the Birupa lie the three Parganas of Kokhuakhand, Kerualkhand, and Kanchikhand. Even at the last Settlement they were, for the most part, free from inundation, and the rice lands could be watered from the hill streams flowing down through Dalijora.

They are now partly irrigated by the High Level Canal and the mean incidence of the ***Pahi*** assessment has risen from Rs. 2-7 to Rs. 3-3 per acre.

In Kerualkhand the average of rents was very high at the last Settlement, partly owing to the large area of homestead land, and a careful scrutiny of the village figures shows that where rents were already high, they have not been influenced by irrigation, and though they have risen largely in a few villages, the rise is almost the same for irrigated and unirrigated lands. In Kokhuakhand canal water is taken generally in the villages which were formerly most lightly assessed, the others being already irrigated from tanks and streams. In the former group the average incidence of rent has risen from Rs. 2-8 to Rs. 2-15 per acre, and in the others from Rs. 3 to 3-7. Mr. Carey, in his report, points out that within the canal irrigated area the rise of rents is greatest in those villages in which the percentage of the area irrigated is greatest, but this fact might, to some extent, be accounted for by the natural tendency of the lowest rents to rise most. On the whole I think that in this group the effect of irrigation has been to improve the worst lands and to level up the lower rents.

Group H.

In Group H,I have included the Parganas lying on the Birupa and Kimeria rivers and forming the most disastrously flooded tract in the Province. The Birupa is confined by embankments, and in flood time is banked up against the waters of the Kimeria and the hills of Alti, so that the flood covers Kuhunda Jaipur, and part of Dihi Arakhpur and Alti for days at a time.

The mean incidence of the *pahi* rents in the group has risen from Rs. 2-3 to Rs. 2-14, but we may exclude the two small Parganas of Bargaon and Dihi-Arakhpur, the circumstances of which are peculiar, and consider only the other two. They were both much over-assessed before the last Settlement, and though reductions were then made, it is probable that the assessment was still heavy. Nevertheless, we find the incidence of *pahi* rents in Kuhunda Jaipur nearly doubled, and that in Alti increased by more than Rs. 1-4 per acre. Part of Alti is indeed protected and irrigated, but rents are no higher in these villages than in the unprotected area, and Babu N. C. Kar, who spent two years in these parts, reported that he could find no evidence that in this Pargana irrigation or protection had caused any extension of cultivation or enhancement of rents.

Group I.

In Group I are included the four principal Parganas protected by the Baitarni and Bura Kharsua embankments and irrigated from the Jajpur Canal.

As a reference to the statement of irrigated areas will show, the extension of irrigation is too recent to have much affected rents, but the canal embankments have made a great change in the agricultural conditions of the country. The mean incidence of *pahi* rents in this area has risen from Rs. 1-12 to Rs. 2-13. The protection, though on the whole beneficial, has had its drawbacks, and it is not easy to say how much of the increase is due to it. No direct evidence of enhancement of rent rates on account of protection or irrigation was found, and I do not think much can have been made.

Group J.

Block J contains the Parganas on the right bank of the Kharsua, the floods in which have been aggravated by the protection afforded to the last-named group.

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Nevertheless the rise in the mean *pahi* incidence is from Rs. 1-14 to Rs. 2-13, or almost the same as in the last block. At the last Settlement, indeed, the assessment of these Parganas was higher than in Group I, but in Olas at least the *thani* rents were too high, for the tenants refused to accept their *pattas*.

Group K.

In Group K are two Parganas which have benefited by irrigation, but much more by protection and drainage. They show the largest increase in rent rates of any of the groups, but no evidence could be found of higher enhancements in the irrigated than in the unirrigated lands.

We may, however, safely assume the enhancement of rent rates in these Parganas on account of irrigation at not less than As. 8 per acre.

Summary.

It will thus be seen that there is little, if any, evidence of general enhancement of rents on the ground of irrigation or of higher rates in irrigated than in unirrigated villages, though there is evidence that rent rates have risen more in the protected and irrigated tracts than in the unprotected and unirrigated. There is, however, some reason to think that irrigation causes the lowest rents to rise, and in fact has a tendency to equalise rents through out an irrigated area. Of course if there has been a greater increase of cultivation in the irrigated area, this would in itself serve to veil any rise of rent rates.

Extension of cultivation due to Irrigation.

112. The following figures may be examined :—

| Name of Group. | Percentage of area assessed at last Settlement. | Percentage assessed at this Settlement. | Difference. | Name of Group. | Percentage of area assessed at last Settlement. | Percentage assessed at this Settlement. | Difference. |
|---|---|---|---|---|---|---|---|
| A .... | 66 | 81 | 15 | G .... | 54 | 66 | 12 |
| B .... | 59 | 72 | 13 | H .... | 50 | 73 | 23 |
| C .... | 47 | 59 | 12 | I .... | 62 | 81 | 19 |
| D .... | 53 | 65 | 12 | J .... | 55 | 76 | 21 |
| E .... | 62 | 72 | 10 | K .... | 60 | 81 | 21 |
| F .... | 53 | 73 | 20 | L .... | 68 | 76 | 8 |

It will be seen that the increase of cultivation is certainly no greater in the protected and irrigated groups, and all the enquiries made have failed to elicit any evidence of a substantial extension of cultivation to lands which but for the canal water were not likely to have been reclaimed. It is of course certain that some lands, such as the sand-damaged areas in Kodinda have been reclaimed, which, without canal water, would not pay for cultivation, but on the other hand there are high lands which would probably yield better crops in flooded than in irrigated areas. Irrigation can only reach comparatively low lands, and these can almost always be reclaimed. The people are generally too lazy to use lifts for reclamation of poor lands. The effect of protection without irrigation is rather to restrict than to increase the extension of cultivation.

Extension to fresh areas during the term of Settlement.

113. Up to date some 88,000 acres have been provided with distributaries, but of this only, some 229,000 acres are likely to be irrigated.* Out of this, some 195,000 acres are now irrigated, leaving a margin of 36,000 acres.

It is probable that there will be a large extension of irrigation in Parganas Benahar and Khandi on the Taldanda-Machgaon System, in Tikan, on the Kendrapara Canal, in Jajpur, Dolgram, Katia, and Ahyas on the Jajpur Canal. It is, however, very difficult to foretell what may happen when the existing leases fall in, and so much depends on the chance of the seasons that I will not ventuee to make an estimate of the area likely to be irrigated.

Effect of irrigation on collections.

114. Whatever opinions they may have as to the effect on rent rates, all officers engaged on fair-rent work are unanimous in reporting that protection and irrigation have greatly improved collections. The committee appointed to enquire into various matters connected with the Orissa Canals calculated (paragraphs 42 and 62 of their report) that on an average one-tenth of the annual crop was destroyed by

* See Revenue Report for 1898-99. Paragraph 12 of Report on Orissa Canals.

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floods and one-twelfth by drought. This should entail corresponding remissions of rent, and we should accordingly find the value to the Zamindar of the protection by canal embankments to be 10 per cent. of the rental, and of protection and irrigation over 18 per cent.

This is clearly too high, for it is only in a very few areas that collections fall so low as 82 per cent.

The average collections, as calculated from the figures given in the completion reports, are in Cuttack 94 per cent., and in Puri, which is mostly flooded and liable to drought, 92 per cent. In Balasore, where rents are lower, Mr. Kingsford estimates collections at about 85 percent: probably something less than 90 per cent. is collected, that is, 90 per cent. of a nominal demand, which is considerable more than the landlords expect to collect. Taking unprotected and partially-protected Parganas we find—(the figures are for a few estates only in most cases)—that the collections are returned as follows :— Paenda, 90 per cent.; Kate, 87 per cent.; Kodinda, 81 per cent.; Hatimunda, 95 per cent.; Apilla, 98 per cent.; Alti, 91 per cent.; Bardiala, 105 per cent.; Kuhunda-Jaipur, 43 percent.; Suhang, 61 per cent. In the last two Parganas the figures are for one estate only and for a period when the crops were destroyed by floods. Bardiala is a problem as it is both highly assessed and heavily flooded; the management is exceptionally good.

Among irrigated and protected Parganas we find Matkatnagar, 98 per cent.; Saraswati, 96 per cent.; Kanchikhand, 94 per cent.; Tiran, 108 per cent.; Hariharpur 98 per cent.; Kerualkhand, 94 per cent.; Khandi, 99 per cent.; Koronia, 94 per cent.; Padampur, 92 per cent.; Karimul, 94 per cent.

My general conclusion is that from 85 to 95 per cent. is collected or should be collected in unprotected and over 95 per cent. in protected and irrigated areas. The difference in collections may range from 5 to 10 per cent. on an average for the district of Cuttack. The balance of the loss appears to be borne by the cultivators.

In Balasore the area at present irrigated is too small to draw any conclusions.

**Profit of Government from Irrigation.**

115. To decide to what extent the Government has been recouped for its expenditure by the larger land revenue obtained at this Settlement, I would ask that the following table should be considered. The letters refer to the grouping of Parganas made for the statement of incidences in paragraph 110.

| PROTECTED AND IRRIGATED. | | | | | | UNIRRIGATED. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name of Group. | Land Revenue, last Settlement. | | Land Revenue, present Settlement. | | Increase per cent. of land revenue. | Name of Group. | Land Revenue, last Settlement. | | Land Revenue, present Settlement | | Inc ease percent. of land revenue |
| | Percent. | Amount. | Percent. | Amount. | | | Percent. | Amount | Percent. | Amount. | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | | Rs. | | Rs. | | | | Rs | | Rs. | |
| A... | 63 | 78,928 | 54 | 1,12,981 | 43 | B ... | 63 | 59,076 | 55 | 84,136 | 42 |
| C... | 63 | 23,918 | 55 | 34,220 | 43 | D ... | 65 | 19,984 | 53 | 28,798 | 44 |
| E... | 63 | 90,880 | 56 | 1,25,320 | 38 | F ... | 62 | 84,558 | 53 | 1 33,017 | 57 |
| G... | 66 | 19,583 | 56 | 24,497 | 25 | H ... | 64 | 45,538 | 52 | 74,300 | 63 |
| I... | 65 | 63,333 | 52 | 1,10,025 | 74 | J ... | 64 | 61,027 | 52 | 95,185 | 56 |
| K... | 64 | 20,417 | 52 | 42,905 | 110 | L ... | 66 | 50,175 | 54 | 75,583 | 51 |
| Total | 64 | 2,97,059 | 54 | 4,49,948 | 51 | Total | 64 | 3,20,358 | 53 | 4 91,019 | 53 |

There is apparently no great advantage to Government in the increase of revenue in the protected and irrigated tracts. There is a difference of only 1 per cent. in the percentage taken, while the gross increase is greater in the unprotected Parganas. This is due to two causes; firstly, the very narrow limits of the discretion left to the Settlement Officer in the percentage of the assets to be taken as revenue ( 50 to 55 per cent. ) and the very strict interpretation by the Board of Revenue of the Secretary of State's orders; partly also to the limitation on enhancements of revenue imposed by the necessity of considering the proprietor's income. I am myself of opinion that if the zamindars of the flooded tracts

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can pay an average of 53 per cent., as they can, those of the protected and irrigated Parganas could as well have afforded to pay 58 to 60 per cent., though a *rasadi* increase would have been necessary in many cases. My proposals for taking more than 55 per cent. in the irrigated and protected areas would have been much more frequent than they were, but for the fact that, in addition to the benefits of irrigation, I could not point out other reasons for taking more than 55 per cent. as revenue. As revenue has been settled we may, perhaps, credit one quarter of a lakh, or at the outside half a lakh, of the increase directly to protection and irrigation.

The other sources of profit to Government from canals and their embankments are three in number : (1) Irrigation receipts, (2) Navigation receipts, (3) Saving of remissions.

The first two sources of revenue attained their maximum in 1897, when for the only time since their construction, the receipts more than paid the working expenses of canals. Previous to 1866 the average annual remissions of revenue on account of floods and drought were in Puri Rs. 27,000 and in Cuttack Rs. 62,000. Since the great famine there have been none, but this I attribute rather to the smaller proportion now borne by revenue to rents than to protective measures. Were it otherwise we might have expected to find remissions of revenue in Puri, though not in Cuttack; but I think, we may put to the credit of irrigation and embankments an annual sum of Rs. 30,000 on this account. If the embankments were now abandoned, the loss would probably be many times greater, but the estimate represents what might have been expected to be remitted, had embankments remained as they were in 1860.

The account for irrigation works then stands as follows. I give both 1897-98 and 1898-99 :—

| | 1897-98. Rs. | 1898-99. Rs. |
|---|---|---|
| Working expenses : direct and indirect .... .... | 5,39,900 | 4,95,200 |
| Interest of 4 per cent. on capital .... .... | 10,27,500 | 10,30,200 |
| Total charges | 15,67,400 | 15,25,400 |
| Receipts for irrigation .... .... .... | 3,14,700 | 2,72,400 |
| Ditto navigation .... .... .... .... .... | 2,11,300 | 1,72,700 |
| Ditto miscellaneous .... .... .... .... | 28,700 | 24,500 |
| ***Deduct*** Refunds .... .... .... .... .... | —2,800 | —4,100 |
| Total Direct Receipts .... .... .... .... | 5,51,900 | 4,65,500 |
| ***Add*** estimated gain in new revenue due to the canals .... .... .... .... .... | 25,000 | 25,000 |
| ***Add*** estimated saving in remissions .... .... | 30,000 | 30,000 |
| Grand Total Revenue from canals .... .... | 6,06,900 | 5,20,500 |
| Nett deficit of the year .... .... .... .... | 9,60,500 | 10,04,900 |

These figures take no account of agricultural embankments, nor of embankments in Balasore. On agricultural embankments the average expenditure from 1878-79 to 1897-98 was Rs. 1,04,600 and there are no direct receipts, though it may be taken that it was necessary to the security of the revenue. When the canals were begun it was inticipated that there would be a large saving in the expenditure on other embankments, but so far there has not been much, as will be seen from the following statement :—

***Average annual expenditure on agricultural embankments in Cuttack.***

| Period. | Amount Rs. | Period. | Amount. Rs. |
|---|---|---|---|
| 1839-45 .... | 10,800 | 1867-76 .... | 88,400 |
| 1846-52 .... | 13,700 | 1877-86 .... | 48,800 |
| 1853-59 .... | 40,800 | 1887-96 .... | 53,900 |
| 1860-66 .... | 59,200 | | |

It is clear that the amount expended can never be recovered by Government, although, as estimated in paragraph 109 above, the gain to the people may be taken as equal to over 13 lakhs per annum in the irrigated area and 26 lakhs on the whole districts of Cuttack and probably over 40 lakhs of rupees on the province.

**Permanently-settled areas.**

116. The irrigated tracts which are permanently settled comprise Perganas Madhupur, Darpan, Chhedra and Derabisi.



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In Madhupur the irrigated villages differ much from the others, and rents had so long been left unadjusted and areas were so doubtful that no comparison could be made of rates for irrigated and unirrigated land.

In Chhedra records were attested long ago, and there are no figures from which any conclusion as to the effect of irrigation can be drawn.

In Darpan an enquiry was made by Mr. A. C. Sen, and his figures were criticised in Mr. Maude's letter No. 2399, dated 16th November 1893. Briefly, the results were that the extension of cultivation and rise of rent rates did not appear to have been accelerated by irrigation. This may be accounted for by the great impulse given to extension of cultivation by the opening up of communications through the unirrigated tract which obscured the effects of irrigation, and there is no doubt that the increase of rents in Darpan is due in no small measure to the canals.

Derabisi requires a longer notice, having already formed the subject of two reports by Babu Jamini Mohan Das.

In the former report Babu Jamini Mohan Das, basing his conclusions on the figures for a small group of villages in the south-west of the Pargana, came to the conclusion that the lands might be divided into three blocks.

(1) Directly improved by irrigation. These were formerly ***chhota laghu*** (see paragraph 128) and ***biali*** lands now growing two crops.

(2) Middle class ***sarad*** lands in which irrigation made little improvement.

(3) Lowlands, now overflooded by the canal water.

He analysed the present rates in the three classes, or rather the average rate for each class.

He assumed that, but for irrigation, the rates would have been equal, and on this doubtful basis argued as to the effect of irrigation. The premises being unreliable and there being no means in the absence of the old ***Khasras*** and ***Khatians*** of ascertaining the previous rate, the calculation was rejected by the Director of Land Records.

The Assistant Settlement Officer now reports that, with the exception of the south-western corner, the Pargana is unsuitable for irrigation; that more than half is too low or too high, and that there is little prospect of much extension of irrigation beyond the present area, which is 21 per cent. of the cultivated land.

I do not quite agree for I think some of the ***pats*** might be first drained and then irrigated, but the question is outside the scope of this enquiry.

The comparison of rates plot by plot before and after irrigation has been abandoned, the ***bhaurias*** (Khasras) not being produced and the ***bhians*** (rent-rolls) of different periods so variously prepared that they are not comparable (see paragraph 7 of the report). There remain therefore but two methods :— (*a*) Comparison of the rental and incidence of rents in the same village at different periods; (*b*) comparison of the incidence of rents in irrigated and unirrigated villages.

To begin with (*b*), it is shown in Babu J. M. Das's report (paragraph 4 to 6) that rents are not now markedly higher in the irrigated than in the unirrigated villages.

For the purpose of comparison of rents at different periods the areas and rents in the ***jamawasilbaki*** (collection papers) and ***ekpadia bhians*** (rent-rolls) filed have been totalled and compared with the attested records.

The first point thus brought out is the very much larger areas shown in the ***khatians*** than in the zamindar's papers. The following villages taken at random are sufficient to show this :—

| Village. | Per cent. irrigated. | Area according to Zamindar's papers. | | Area according to Khatians. |
|---|---|---|---|---|
| | | Year | Area | |
| Arakhand .... .... | 72 | 1878 | 163 | 181 |
| Balbhadrapur .... .... | 36 | 1878 | 313 | 338 |
| Borpailo .... .... | 30 | 1892 | 121 | 161 |
| Benipur .... .... | 37 | 1886 | 250 | 281 |
| Nahang .... .... | 31 | 1881 | 191 | 233 |
| Jagannathpur .... .... | 25 | 1887 | 180 | 232 |
| Bilemgheri .... .... | 16 | 1892 | 425 | 145 |
| Despur .... .... | 80 | 1898 | 107 | 119 |
| Dhol .... .... | 58 | 1893 | 467 | 611 |

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I conclude from this that there has been extension of cultivation, but that it was not generally shown in the *jamawasilbaki*, as it was very much to the interest of the *mustajir* (lessee) to conceal it.

As to rents I fear the figures are not such as to warrant any conclusion. Taking such as on the face of them appear reliable, we get the following instances of increase since the date of introduction of irrigation :—

| Village. | Percentage of Irrigation. | Date of first introduction of canal water. | RENT BY ZAMINDAR'S PAPERS. | | 1898-99 Attested rental. | Approximate year of enhancement. | Remarks. |
|---|---|---|---|---|---|---|---|
| | | | Year. | Amount. | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | | | | Rs. | Rs. | | |
| 1. Arakhand .... | 72 | 1873 | 1870 | 344 | 512 | 1880-5 | Rents low. |
| 2. Despur .... | 80 | .... | 1876 | 393 | 506 | 1880 | The figures are a little suspicious |
| 3. Kanderpur .... | 62 | 1878 | 1881 | 507 | 611 | 1885 | |
| 4. Barahilo .... | 30 | 1873 | 1876 | 335 | 422 | 1891 | |
| 5. Chasakhand | 52 | 1873 | 1882 | 307 | 372 | 1890 | |
| 6. Dhol .... | 58 | 1878-91 | 1884 | 1,137 | 1,431 | Continuous. | |
| 7. Balia .... | 47 | 1873 | 1872 | 501 | 559 | | |
| 8. Dorbol .... | 53 | 1873 | 1869 | 335 | 389 | Possibly before introduction of irrigation. | |
| 9. Benipur .... | 37 | 1873 | 1877 | 840 | 845 | .... | |
| 10. Waukhand .... | 52 | 1869 | 1865 | 457 | 513 | .... | |
| 11. Jagannathpur | 25 | 1878 | 1877 | 452 | 538 | .... | A much larger increase before 1877. |
| 12. Nahang .... | 31 | 1878 | 1881 | 556 | 573 | .... | A large increase before irrigation. |
| 13. Nilkanthapur | 50 | 1873 | 1879 | 894 | 879 | .... | Area also decreased. |
| 14. Nurkhanpatna | 20 | 1878 | 1869 | 124 | 122 | .... | -do- |
| 15. Bazan .... | 43 | 1873 | 1888 | 271 | 253 | .... | Area increased. |
| 16. Gopinathpur | 71 | 1869 | 1892 | 418 | 407 | | |
| 17. Sunderpur .... | 98 | 1873 | 1882 | 149 | 146 | | |
| 18. Raipur .... | 33 | 1877 | 1878 | 825 | 816 | .... | Reached a maximum of Rs. 863 in 1882. |
| 19. Beruan .... | Nil | .... | 1885 | 930 | 916 | | |
| 20. Nagaswarpur | Nil | .... | 1889 | 461 | 332 | .... | Marked decrease in area. |
| 21. Mangrajpur | Nil | .... | 1879 | 133 | 133 | | |

The largest increase is found in the first six villages, where irrigation is largely practised. The next six villages though irrigated show only a normal or less than normal increase.

The last nine are instances of an actual decrease.

On the whole the figures appear to bear out the theory that the increase is greater in the irrigated villages but there are marked exceptions as Nilkanthapur and Sunderpur.

The figures for Gopinathpur are too recent to be of much value.

It is impossible to estimate how much of the increase is due to irrigation, or would not have been but for irrigation. The Assistant Settlement Officer reporting does not consider that the facilities for obtaining canal water have caused a rise of rents, but it appears to me that the figures compiled do warrant a conclusion that some part at least of the increase in rents is due to irrigation.

How far the figures are reliable is another question : there is certainly reason to distrust some of them, and the Assistant Settlement Officer places no great reliance on any.

In conclusion, I would say that these reports have added very little to our previous information. It was not to be expected that they should, as in

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temporarily-Settled areas, with far more reliable figures to work on, the officers employed had failed to prove anything definite.

**Conclusions.**

117. Having set forth the results of the enquiries made, I am now in a position to answer the questions put by the Director.

(1) Has there been a rise of rent rates due to irrigation ?

There has been a rise owing to the improvement in lands which previously suffered for want of water, but enhancements on the specific ground of the value of the lands having been increased by irrigation are very rare and in no case proportionate to the increased outturn. This is, in my opinion, to be accounted for—***firstly***, by the restraining effect of the proclamation of 19th July, 1866; ***secondly***, by the fact that rates in Orissa are not calculated upon a strictly economic basis, so that they never do increase in proportion to the increased value of the produce, and a raiyat in possession of second class lands changed by irrigation into first class, will actually pay, in the form of rent and water rates, as much as the owner of unirrigated first class lands yielding an equal crop; ***thirdly***, that a great deal of the irrigation is very recent and that zamindars have abstained from enhancements in view of the pending settlement; ***fourthly***, that the lands on the Taldanda and Kendrapara Canal systems, in which irrigation first became general, were among the richest in the Province. They were in no great need of irrigation, and rents were already very high.

No estimate can be made of the amount of the enhancement due to irrigation, but in most reas it is certainly small in comparison with the total increase due to growth of population, higher prices, and improved communications.

These alone would suffice to account for the whole increase in rents and more. I may said that nominal rent rates have in hardly any areas risen above those shown in the ***thani*** raiyats' rent rolls (***bhians***) at the last Settlement. Rents are raised not by enhancement of rates, but by re-classification of lands; and to complete this enquiry, it would have been necessary to make soil maps and to show against the present fields the numbers and rent rates at the last Settlement. The attempt to indentify last Settlement fields was discontinued at an early stage of the Settlement, and though a comparison has actually been made in one or two selected villages, it has produced no definite result.

(2) Has there been owing to irrigation an extension of cultivation to lands that would not otherwise have been reclaimed ?

It is certain that in some localities there has been a small increease on this ground, but it is almost negligable in comparison with the general increase in the Province and no direct evidence on this point has been obtained. There are lands in many Parganas now cultivated with the help of canal water that apparently could not be cultivated without it, but the face of the country has been so changed by the embankments that it is impossible to say that if these had not been constructed, crops could not have been grown.

(3) To what new areas is water likely to be extended during the term of Settlement from canals now existing ?

There is likely to be a considerable extension in Jajpur and Tirtol Thanas and in the neighbourhood of Kendrapara, but the extent cannot safely be estimated.

(4) What enhancement of rent rates has been due to the construction of canal embankments ?

There has been an undoubted increase in certain areas, such as Tikan, Chaudakulat, Saibir, Kate, but it is in some measure at the expense of lands outside the protected area. Perhaps we may take annas 3 per acre as representing the increase on the 5,00,000 acres of country protected by these embankments which may be attributed to the protection and irrigation of the canals.

(5) What extension of cultivation has then been due to the canal embankments ?

Generally there is none. Probably in Tikan a good part of the increase may be attributed to this source.

(6) What effect have the canal embankments had on zamindar's collections ?

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I think that to irrigation and protection, combined as they are, a difference from 5 to 10 per cent., or say annas 4 per acre, may be attributed; certainly not less on the whole than 5 per cent. and probably not as much as 10 per cent., but now that rents and revenues have been enhanced. I think that practically full rents will be collected in irrigated and about 90 per cent. in unprotected and unirrigated areas. I mean of course that these collections will be made on an average deduced from a number of years.

Proposals.

118. It appears to be the present intention of Government to be content with the enhancement of land revenue in the case of temporarily-settled estates, and to abandon both the original proposal to limit the term of Settlement to fifteen years in the case of lands accessible to canal irrigation (letter No. $\frac{1250}{1710}$ from the Government of India to the Government of Bengal) and the suggestion to extend the owner's rate to lands which may become irrigable during the term of Settlement (Government of Bengal to the Board of Revenue, No.90 T.-R., dated the 25th May, 1894).

As to this second proposal, I would, however, as it has not been definitely overruled, beg to point out that it is most unfair to the occupiers of the lands it would affect. There is but little, if any, difference between the incidence of revenue in the irrigated and in the protected but unirrigated areas, and, as I have shown, the enhancement of rents due to irrigation in the former is very small, and only a very small part of the increase in revenue in irrigated areas can be attributed to irrigation. If a rate is to be imposed at all, it would be better to take 5 per cent. on all estates in the protected area, even though this might in some cases press hardly. I think that it would not be unfair to adopt the original proposal of Colonel Gulliver and impose a cess of eight annas per acre on all protected lands. This would bring in about 2½ lakhs, and would represent but a fraction of the benefit enjoyed by raiyats and zamindars.

In the permanently-settled estates an assessment of four annas per acre protected by canal embankment would be more than covered by enhancement of rents, extension of cultivation, and increased collections.

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## CHAPTER VI.

### AGRICULTURAL INFORMATION.

Agricultural information.

119. A comprehensive account of the Agriculture of Cuttack has been written by Mr. Banerjei of the Agricultural Department* and notes on the principal crops have been written by Mr. Arnott, of the Public Works Department, and by Messrs. Nathan and Walsh, when Assistant Settlement Officers in Puri.

There is therefore little new information to be given, and this chapter can be but little more than extracts from the existing reports, to which I would refer those requiring further details.

Soils.

120. The first point to be considered is the nature of the soil. The cultivators of Orissa recognise a large number of different classes of soil, each having a name of its own which may vary in different localities. In an ordinary village the lands fall primarily under three main divisions, according to their situation, viz.—

*Jala* or wet lands, embracing all the rice lands of the village.

*Kala,* literally 'black', meaning the high lands about the homestead which, enriched by manure and household refuse, are used to grow vegetables, cotton, jute, and other valuable crops.

*Pal,* or riverside lands which receive a deposit of silt (*pattu*) and are suitable for growing tabacco, cotton, mustard, and other *rabi* crops.

Again, according to their elevation, the arable lands are known as *khal,* or low lying, and *dhipa,* or high lands. Very low lands in hollows almost always full of water, so that they can only grow crops in the dry season or very coarse varieties of paddy, are called *gahira,* while in hilly country the lands at the valley bottom are known as *garara.* High lands that suffer from want of silt and water are commonly contemptuously referred to as *thenga, thangi,* or *dangar.*

Again, according to their composition, soils † are classed as follows :—

(1) *Matal* is the name given to all kinds of stiff clayey soils. Rice and sugarcane are the principal crops grown on them, but besides these wheat, *birhi,* and *kulthi,* are also cultivated.

(2) *Chikita,* is a strong sticky clay, which is almost too stiff to be used for successful cultivation, and grows for the most part coarse varieties of the *sarad* or winter rice. The outturn on such lands is said to be generally very poor.

(3) *Chauria* is also a hard clay, which is very liable to cake on being exposed to the sun when ploughed. It generally cracks into hard blocks on getting dry, and is altogether an inferior soil.

(4) *Dorosha* is a mixture of sand and clay in nearly equal parts. It is used for *biali* or autumn rice and for all *rabi* crops. It is easily worked and is retentive of moisture.

(5) *Telbalia* is the name given to a loam which contains a larger admixture of sand than the *dorosha* lands. It is looser in texture, and being poorer requires more manuring than a *dorosha* soil.

(6) *Baliamatal* is a loam with a large admixture of earth; in other words, a rich sandy loam.

(7) *Rangamati* is a red ferruginous sandy loam occurring near laterite rocks. Like *telbalia* it requires a great deal of manuring before it can produce a good crop.

(8) *Thengajami* is an elevated sandy loam, with very little moisture, which as a rule is allowed to lie waste, though sometimes ploughed up for growing

* Report on the agriculture on the district of Cuttack, 1893.

† Taken from Mr. Banerjei's report.

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*biali*, paddy, *mandia*, and *kulthi*. The crops on such lands are necessarily very poor.

(9) *Balia* is the name given to very loose sandy soils which grow poor specimens of *rabi* crops.

(10) *Pattu* is an alluvial soil, formed from silt deposited by floods. It is used for tobacco, mustard, jute, coriander and cotton, and is taken advantage of to grow all kinds of miscellaneous crops.

(11) *Pankua* is a black mud unmixed with sand, such as is found at the bottom of ponds and tanks.

(12) *Rektimatal* is a stiff rich soil.

(13) *Pansia* is a loose though comporatively fertile soil.

(14) *Gangutia*, as the name would signify, is applied to a clay containing an admixture of *ganguti* or lime, to be met with near those river beds which abound with nodulous limestone. An admixture of clay and limestone dust is in some places known as *khali* soil.

(15) *Nunajami* is land which is more or less of a saline nature. It is generally of very little use. A few varieties of *laghu sarad* rice are grown on it, when it does not contain an excess of salt.

According to their fertility, soils are divided into four classes : first (*aul*), second (*dayam*), third (*sayam*), and fourth (*chaharam*); but to hear the ordinary raiyat talk, one would not believe that there was any first class land in the Province, and might be inclined to put down all fields under one of three heads 'Water holes' (*pani-gahira*), 'uplands where the foxes have their earths' (*kenkshiali pasiya*), 'river sand,' the ordinary terms used by the cultivator in describing the fields of his holding.

**Manuring.**

121. Rice lands are generally manured with cowdung-ashes and house-hold refuse, more rarely with rotton cakes of unburnt cowdung. The cowdung is carefully gathered by the women and children, but, except in a few favoured localities, has to be used for fuel, and can only find its way to the soil in the form of ashes. It is spread on at the time of the first ploughing at the rate of about half a ton (dung and refuse) to the acre, except on flooded lands which are enriched by silt. Sugarcane, *pan*, and vegetables are more heavily manured, and oil-cake (*piria*) is often used in their cultivation.

Ordinary manure (*khata*) costs about two to four annas per cart load of 10 maunds, but it is rarely sold, except near the towns, each cultivator using the produce of his own home.

**Irrigation.**

122. Water is wanted chiefly at three times of the year; in May-June for ploughing ; in July and August for *bhiushan* or ploughing up of the young rice plants, and in October for the final ripening of the crop. In areas irrigated by canals, water is taken from April to December, but in most parts of the district irrigation from streams and tanks is only resorted to for paddy in October-November, and is generally confined to the more valuable crops such as sugarcane, tobacco, and cotton.

Irrigation from wells I have not come across, and the tanks which at one time abounded in certain Parganas have to a great extent silted up; but water is taken from the *nallas* or *jores* in the low-lying tracts near the coast by means of the *tenda* or bamboo water-lift. Where the water had only to be raised a few feet it may be scooped up in a *senz*, a sort of basket made of split bamboo which two men use. Holding by the ropes attached to either side, they swing it backwards and bringing it down sharply into the water, carry the forward motion of the swing through until the *sena*, now full of water, is raised to the level of the water channel, when the contents are poured out.

Another way of lifting water a short distance is with a *janta* (the *karin* of Bihar) made of a single piece of wood about six feet long, hollowed out and shaped like one-half of a canoe; the broad open end resting on the head of the water channel while the pointed closed end dips into the water. When this is raised the water pours naturally into the channel. It may be worked by one man either directly or with the help of a bamboo crane and counter-poise as in the *tenda*, but cannot lift

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more than a couple of feet. It is not uncommon for two of these methods to be combined, the water being lifted by the tenda into a reservoir, and from that into the water-channel by a *sena* or *janta*.

I haven seen tobacco being watered from earthen pots (*mathia*) carried a considerable distance by coolies, but this can only be done for very valuable crops, and where I saw it tried, it would have been such simpler to have made a channel from the river. Mr. Banerjei estimates the cost per acre of irrigating a field once with hired labour at from Re. 1 with the *janta* to Rs. 3 with earthen pots.

Along the foot of the hills fields are often irrigated from the small streams, and, the lift being small, the expense is less.

AGRICULTURAL IMPLEMENTS.

123. A full description of the principal agricultural implements is to be found in Mr. N. N. Banerjei's report and in Mr. Arnott's notes.

The plough.

The plough (*nangal*) is made and kept in repair by the village carpenter for a yearly payment of a couple of *gaunis* of paddy, worth say two annas. The wood is sometimes supplied by the zamindar but more often has to be bought, and costs about eight annas. The share is made by the village blacksmith for another couple of *gauni* of paddy. The plough is light enough to be carried on the shoulder of a man, and with it a pair of bullocks can plough a third of an acre in a day. It is said to be a very indifferent instrument for turning over the soil, but its lightness and cheapness recommend it to the Uriya cultivator.

The Harrow.

The *mahi*, or harrow, consists of two straight pieces of *sal* wood or bamboo joined together by rungs like a ladder. To this the cultivator harnesses his bullocks and standing on the middle of it is dragged across the ploughed field breaking up the clods under it, and giving the land a level surface. It is used both in preparing the soil to receive seeds or seedlings, and afterwards to give young plants a firm roothold.

The Rake.

The *bida*, or rake, consists of a *sal* wood beam about 5 or 6 feet in length with twelve to sixteen iron tires or prongs about 14 inches in length. To this bullocks are harnessed by means of a pole and they drag it across the fields to loosen the soil and uproot the weeds. Generally it has to be dragged twice across, first in one direction and the second time at right angles to the first in order to completely get rid of the weeds. It is only used on fairly dry land.

The Mattock.

For digging, a *kodali* or *kuri* is used, as in other parts of India. They are of varying sizes and weights according to the purpose for which they are intended.

The Sickle.

For reaping, a small toothed sickle or *dao* is generally used. Another form of *dao* with a straight and heavier blade is used for cutting jungle wood and fodder.

The grass Scraper.

Grass for cattle or horses is scraped off the slopes of river banks or waste lands with a sort of small trowel called a *khurpi*.

The Grain Husker.

Grain is generally husked with a *dhenki*, which consists of a beam of wood about 3 or 4 feet long hung at about a quarter of its length on a pivot between two uprights. At the head of the long end is a thick wooden peg that comes down like a hammer into a stone mortar. To work the machine the mortar is half filled with paddy: the woman (it is generally a woman) then places her foot on the short end of the beam and throwing her weight on it depresses it. The foot being removed, the peg at the other end falls like a hammer on the grain, and so *dacapo*. Less commonly a pestle and mortar is used for husking.

Flour Mill.

Flour is little used by the Uriya, but for crushing pulses a *janta* or *chaki* consisting of two circular millstones working one on top of the other in used, as in other parts of India.

Carts.

The Uriya cart is peculiar. It consists essentially of two poles of *sal* wood or bamboo about 12 feet long tied together at one end about 3 feet apart at the other, and joined by cross bars at intervals. This framework rests on a pair of wheel about

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4 feet high and 4 feet apart, and there is as much behind as in front of the axlebar. The bullocks are yoked one on each side of the narrow end and will drag half a ton 15 or 20 miles a day on a metalled road.

From the Garhjats come heavy buffalo carts, shorter and broader, with low wheels of solid wood, and with the advent of the railway the light little Madras hackeries drawn by a single bullock have become common in Cuttack town.

For carrying grain a long coffin-shaped basket of spilt bamboo called an "*odaro*" is fitted on to the cart and will take some 10 maunds or more.

System of measurement of land.

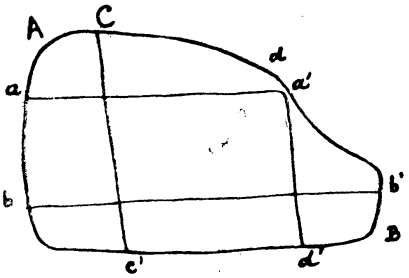
124. I propose to say as little as possible on this subject for fear that zamindars may again revert to the very inaccurate methods formerly in use. At the last Settlement the internal village measurements were made by Uriya amins with measuring rods of local length; these measurements were converted to standard measurement, and in the case of many estates were again reconverted to local measurements. It may be added that the external circuit of the villages as well as the area were surveyed and computed by professional surveyors. As a rule, the Uriya amins measured cultivated lands with fair correctness, but the most confusing mistakes were made in the measurement of large areas of waste lands. In order to fit the areas of waste lands as well as of the cultivated lands within the area ascertained by the professional circuits, the records of the last Settlement contain many ingenious devices, while in not a few cases the attempt was abandoned as hopeless. I may add that sometimes the length of the rod is not stated, so that such local measure as will fit the area of the professional circuit should presumably be used. We have also frequently found that the rod has changed in length since the last Settlement.

In the old Settlement records, the proceedings regarding area refer to the professional survey as "the surveyor's *sahib*'s account," and the other is referred to as "the account of the Uriya *jarib*".

The Uriya measures with a *padika* or rod, and I have more than once inspected a village containing protions of two estates, each using rods of different lengths. These rods are supposed to be kept in the custody of the village chaukidar, and in theory should not be used by the *gomāstha* or *sarbarakar* except in the presence of the chaukidar. In fact the latter is the "official measurer". We find, however, in villages where the *sarbarakar* and raiyats do not get on well, that the latter keep a rod of their own, generally several inches longer than that of the *sarbarakar*.

The following note by Mr. R. Nathan on the Uriya system of measurement and area calculation used at the time of the last Settlement is inserted by way of illustration.

Take any field A B




Calculate roughly average length and average breadth by measuring lines *aa'* and *bb'* ( length ) and *cc' dd'* (breadth ) with the *padika*.

Let *aa'*=12 *padikas*, *bb'*=15 *padikas*, *cc'*=13 *padikas dd'*=8 *padikas*.

Then average length= $\frac{12+15}{2}$ =13½ *padikas*=3 *kahans* 6 *pans*.

Average breadth=$\frac{13+8}{2}$ =10½ *padikas*=2 *kahans* 10 *pans*.

N. B. 4 *Padikas*=1 *kahan*; 1 *padika*=4 *pans*.



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To calculate the area multiply the average length by the average breadth omitting the term formed by the product of "*pan*" into "*pan*" and remembering that the area of a square of which the side is 1 *kahan* is 1 *gunt* and that the area of a parallelogram of which the length is 1 *kahan* and the breadth 1 *pan* is $1\frac{1}{20}$ *biswa*.

Thus, area,=( 3 *kahans*+6 *pans* ) ( 2 *kahans*+10 *pans* )
=6 *gunts*+12 *biswas*+30 *biswas*
=8 *gunts* 10 *biswas*.

The term formed by the product of 6 *pans* and 10 *pans* is omitted.

The error caused by the omission is 60 square *pans* or $\frac{60}{16}$=4 *biswas*; *i. e.*, about 3 per cent.

One result of the system is, therefore, that the area recorded in the old Settlement papers is, generally less than the true product of the recorded length and breadth of the plot, and therefore, other considerations apart, the recorded area is in general less than the actual area.

The maximum error that can occur is 15×15 *pans*, or rather less than one *gunt*.

To take an actual case—

MAUZA BHATBANDA—*Bhowria* No. 589.

As recorded—average length [calculated from three traverse lines]=3 *kahans*, 8 *pans*
average breadth=7 *kahans*, 8 *pans*.
recoreded area=23 *gunts*, 13 *biswa*.
Area according to rule=( 3 *kahans*+8*pans* )(7 *kahans*×8 *pans* )
=21 *gunts*+24 *biswas*+21 *biswas*
=23 *gunts* 13 *biswas*.
and the error=24 square *pans*=1½ *biswas* or 4 per cent.

The general explanation of the local land measure is as follows: Every *padika* is so many *dastis* in length, a *dasti* is supposed to be 4½ inches or the width of a man's fist across the knuckles.

To account for inaccuracies of measurement, *e.g.*, the slipping forward or backward of the rod, and to give the raiyat every allowance for *hira* and *ahri* ( the embankments within and the ridges on the border of his field ) a *kani** is added to the number of *dastis* of which every *padika* is composed. A *kani* varies according to the number of *dastis* in the *padika*; in theory, at least, it is larger where the number of *dastis* is larger, but zamindars give *kanis* of different sizes, and some give no *kani* at all. It is for this reason that an 18 *dasti padika* in one local area may be of quite a different length from a *padika* of that name in another.

I need only give one instance of the *padika* to illustrate its use as a land measure. The so-called standard *padika* is 10 feet 5 inches and 1 *job* in length where a *job* is that fraction of an inch which will make a square *padika* equivalent to a *biswa* of size sufficient to be equal to $\frac{1}{160\times25}$ of a *man* or acre. The standard *man* therefore consists of 25 *gunts* and a *gunt* of 16 *biswas*, and a *biswa* is one square *padika* of 10 feet, 5 inches and 1 *job*. The standard *padika* is called the "24-*dasti padika*".

| | Ft. | ins. | *job*. |
|---|---|---|---|
| 24 *dastis* of 4½ inches each ... ... | =9 | 0 | 0 |
| Add a *kani* ... ... ... ... | =1 | 5 | 1 |
| Total ... ... | =10 | 5 | 1 |

I do not attempt to describe the lengths of the different *padikas* because, as I have shown, the name is no certain indication of the length of any *padika*. It is only necessary to add that the *padika* varies so as to produce a *man* varying from ·248 of an acre to 1·39 acres.

We have endeavoured to avoid any use of the local measure in the final records. This principle was very successfully followed in the Khurda Settlement of 1881, and at the present day raiyats now talk of their "*acres*" and their "*decimals*". At attestation, of course, every raiyat had his area explained to him in local measure as well as in acres and decimals, and was satisfied as to the area in his possession. It is hoped, therefore, that in a short time a uniform system of measurement may be in force throughout the Province.

* Not to be confused with the *kani*, meaning 5 gandas or one-fourth of a *biswa*.

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WEIGHTS AND MEASURES

The Seer *.

125. The standard of weight for ordinary articles of merchandise is the seer which in Balasore is the standard ***seer*** of 80 ***tolas*** (a ***tola*** is the weight of one standard rupee=180 grains, Troy) equal to 2·0532 lbs. advoirdupois. In Cuttack and Puri the ***seer*** in common use is one of 105 ***tolas*** known as the "***Katki seer***" and weighing 2·7104 lbs. advoirdupois.

The parts and multiples of the ***seer*** are—

| | | | | |
|---|---|---|---|---|
| 4 | *chataks* | = | 1 | *pao.* |
| 4 | *paos* | = | 1 | *seer.* |
| 40 | *seers* | = | 1 | *maund.* |

Salt is always sold by the Balasore ***seer*** of 80 ***tolas***. Metals, vegetables, molasses, fish, and a few other articles are sold by the '***pal***' and ***bisa***.

The Bisa.

*A* '***bisa***' weighs 120 ***tolas***, or one-and-a-half standard ***seers***, and is divided into 20 to 30 '***pals***'. The explanation of the use of this measure is that the articles in question are commonly weighed on a steel yard (***bisa kati***), the interval between the point where it balances when the scale pan is empty and that where it balances with 120 rupees in the pan being divided into 20 or more divisions, each called a '***pal***'.

On the standard yard used for metals and molasses there are twenty such divisions and a ***pal*** is 6 tolas. For fish and vegetables the common division is into 25 ***pals***, but 22,28, and 30 ***pals*** are also found.

The divisions and multiples of the *bisa* are :—

| | | | | |
|---|---|---|---|---|
| 4 | *dhans* | = | 1 | *rati.* |
| 4 | *ratis* | = | 1 | *china.* |
| 10 | *chinas* | = | 1 | *marha.* |
| 4 | *marhas* | = | 1 | *karsi.* |
| 4 | *karsis* | = | 1 | *pal.* |
| 20 | *pals* | = | 1 | *bisa.* |
| 80 | *bisas* | = | 1 | *chhata.* |

Troy wieght.

For the precious metals and jewels the standard is the ***bhari*** or ***tola*** of 180 grains, troy, which is divided as follows :—

| | | | | |
|---|---|---|---|---|
| 1 | *bhari* | = | 10 | *mashas* or 2 *marhas.* |
| 1 | *marha* | = | 8 | *ratis* or 2 *chinas.* |
| 1 | *rati* | = | 4 | *dhan.* |

Grain measure.

For the sale of rice, paddy, and other grain the standard of measurement is the ***gauni***, also called in Balasore the ***puri***.† This is a basket with a capacity varying locally from 1½ to 6 ***seers*** of rice and called accordingly "***tin sir gauni***," "***char sir gauni***" etc.

In a few markets the capacity is expressed in ***seers*** of ***birhi***, so that the 3½ ***seers gouni*** of north-eastern Cuttack contains only 2¼ ***seers*** of paddy; but rice is the common standard, and the ordinary 5 ***seer gauni*** holds about 3½ ***seers*** (Cuttack weight) of dry paddy. The measure for large sales of paddy, etc., is the ***bharan*** of from 80 to 200 ***gaunis***, while petty retail vendors use a small measure called a ***katha*** or ***kancha*** which is generally a reputed seer, but in parts is one-tenth of a ***gauni***.

The common multiples of the ***gauni are*** —

| | | | | | |
|---|---|---|---|---|---|
| (1) | 20 | *gaunis* | = | 1 | *pauti.* |
| | 2 | *pautis* | = | 1 | *chhela.* |
| | 4 | *chellas* | = | 1 | *bharan.* |

Found in Balasore where the ***gauni*** is 2 ***seers*** and the ***bharan*** 8 maunds.

| | | | | | |
|---|---|---|---|---|---|
| (2) | 10 | *gaunis (Puri).* | = | 1 | *pautti* |
| | 4 | *pautis* ... | = | 1 | *chhela.* |
| | 4 | *chhelas* ... | = | 1 | *bharana.* |

Found in Balasore with a ***gauni*** of 2⅝ ***seers*** and *bharan* of 10½ standard maunds.

| | | | | | |
|---|---|---|---|---|---|
| (3) | 10 | *gaunis* | = | 1 | *pauti.* |
| | 4 | *pautis* | = | 1 | *chhela.* |
| | 5 | *chhelas* | = | 1 | *bharan.* |

* In volume LXI part I the Journal of the Asiatic Societies page 43, there is a very interesting paper on "Troy weights and general Currency of Orissa" by Babu M. M. Chakraverti.

† Also called "***nauti***" in Puri, but elsewhere a ***nauti*** = 3 ***nauti***.

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Found in the Jajpur sub-division of Cuttack with a *gauni* of 2½ standard *seers* and a *bharan* of 12½ maunds.

| | | | | |
|---|---|---|---|---|
| (4) | 10 *gaunis* | = | 1 | *pauti.* |
| | 5 *pautis* | = | 1 | *chhela.* |
| | 4 *chhelas* | = | 1 | *bharan.* |

In northern and eastern Cuttack the *bharan* varies from 12 to 16 maunds.

| | | | | |
|---|---|---|---|---|
| (5) | 20 *gaunis* | = | 1 | *chhela (or pauti)* |
| | 4 *pautis* | = | 1 | *bharan.* |

This is the genral measure in Cuttack, Khurda and Puri, and the *bharan* varies from 6 to 10 maunds, and is generally 8 Cuttack maunds or 10½ Balasore maunds.

To sum up, a *bharan* is in Balasore 160 *gaunis* and varies from 8 to 16 standard maunds; in Cuttack and Puri it is generally 80 *gaunis*, in a few places 100 *gaunis*, and in north Cuttack 200 *gounis* and varies within much the same limits.

Distances.

The ordinary measure of distance is the *kos* = 2,000 *dhanu* or 4,000 yards, though the villager commonly uses such indefinite terms as a "stones throw" or "shouting distance."

The staple crops of Orissa.

126. Appendix F shows, District by District and Thana by Thana, the areas under the principle crops grown in the Province. Rice occupies (including Khurda sub-division) about 21,82,000 acres, or nearly 88 per cent. of the cropped area. The next crop in importance is *mandia*, a millet grown on some 42,000 acres, or on rather less than 2 per cent. of the cropped area. *China* is a millet of but little importance, though the area sown with it is probably more than the 500 acreas shown in the crop statements.

Other food-grains in column 10 are generally *rabi* crops grown on twice-cropped land. They occupy over 9 per cent. of the cultivated area, and include *kultha* (dolichos biflorus), *birhi* (phaseolus radiatus), *muga* (phaseolus mungo), *harar* (cajanus indicus), *chana* (lathyrus sativus), *barguri* (vigna catjang), and *makka* (zea mays). Of these the first four are the most important, and I should estimate that a third of the total area shown represents *kultha*, and not less than a sixth, harar.

Linseed, *til* (sesamum), and castor are grown on small areas, generally in riverside lands. Others, in column 13, represents chiefly mustard, grown after rice on valuable lands.

Condiments and spices include coriander seed or *dhania*, ginger or *ada*, turmeric or *haldi*, and some garden crops such as onions, chillies and arrowroot. The total area is only 850 acres, as most of these crops are grown in the homestead lands shown in column 27. Sugarcane is grown in rotation with paddy on well irrigated lands. Only 1,700 acres are shown under this head in the statement, but I am sure that in ordinary years the area planted with this crop is not less than 5,000 acres. As it is grown on rice land, and an extra rent is often payable for its cultivation, it would be natural that amins should have been persuaded to understate the area.

Cotton and jute are valuable crops, but the former is grown on less than 1 acre in a thousand, and the latter on less shan 1 acre in two thousand. Other fibres include *dhaincha* and *sunn*, which are grown to a very small extent.

Many dyes are used by the Uriyas, and are prepared from earth and leaves, etc.

*Kusuma* or safflower is grown in homesteads chiefly in the Puri District. Indigo is grown in a few villages of Cuttack District and in small patches in Puri.

*Pan* is the betel vine grown for its leaves, in which the *supari* nut is wrapped before chewing. It is grown on only 500 acres but is an extremely valuable crop.

Tobacco is grown all over Cuttack on the silt-covered lands on the banks of rivers; the total area shown under this crop, 3,400 acres, represents about the area planted in an ordinary year. In favourable years there is much larger area under it.

*Inkar* is a reed grown to make supports, etc., for the betel vine. The area is certainly under-estimated, as 500 acres of *pan* gardens must represent at least as much *inkar*.

Homestead lands represent what is shown in the *khasras* as *bari* without mention of crop. It includes courtyards and threshing floors, waste lands at the

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back of the house, and gardens within the compound wall. It is not possible to estimate the amount of land bearing crops, but the greater part of it grows cucumbers or spices, and miscellaneous herbs or fruits or pulses for home consumption.

Maize is often grown, and so are plantains, *bael*, etc., while in the out-lying plots *chana* and *kultha* are often to be found. I estimate that of 1,14,000 acres shown under this head at least half must actually grow some sort of crop.

Garden produce and fruit-bearing orchards, represents mango groves, plantations of plantains, *pulang*, jack fruit, toddy palm, and other trees, and gardens where such are distinguished from homestead. Probably of the 51,000 acres about 40,000 represent groves of mango and other trees, which at 25 trees to the acre would give a total of a million trees in the Province besides the isolated trees on raiyati holdings, or on homestead lands or along the roads.

Under yams are included the true yam or *khamba alu* and the commoner *khandamul* or sweet potato. About 3,500 acres are shown under this head, but this is exclusive of the areas included under homesteads in column 27 (Appendix F).

*Baigun* or *Brinjal* (solanum melongena) is the most popular and widespread of Orissa vegetables. The area shown under this head in the *Khasras* is only 2,800 acres, but there must be quite another 10,000 acres included under columns 27 and 29.

Others in column 30 includes chiefly various kinds of melons, pumpkins, and cucumbers grown on the sand-covered banks of rivers, and a small area under onions and *saru* (colocaria antiquorum). Much of the area under these crops is however, included in homestead land.

**Differences in the three districts.**

127. Maps Nos. VI to VIII show the differences in the proportion of land in each local area growing *sarad* and *biali* rice, and it will be observed that there is a very great variation in the figures for the different districts :—

| District. | PERCENTAGE ON NETT CROPPED AREA OF— | | | | |
|---|---|---|---|---|---|
| | Early rice. | Winter rice. | Spring rice. | Twice-cropped land. | Homestead land. |
| Cuttack .... .... | 13 | 70 | 2 | 14 | 5 |
| Balasore .... .... | 1 | 91 | .... | 1 | 5 |
| Puri (Sadar Sub-division) | 6 | 78 | 4 | 10 | 3 |
| Khurda .... .... | .... | 85 | .... | 3 | 2 |
| Orissa .... .... | 6 | 80 | 1 | 8 | 5 |

It will be seen that Cuttack and Puri Sadar subdivision contain far more twice-cropped and *biali* land than Balasore. Khurda grows practically no *biali* or *dalua*, there being but a small area of *jheels* suitable for the latter, while the people seem to have an aversion to sowing early rice and prefer the more risky but more prolific *chhota laghu*. It is likely that the twice cropped area in Balasore is underestimated owing to collusion between amins and proprietors, but it is a fact that there is far less *biali* or *rabi* grown than in the other districts partly owing to the difference in the soil, and partly to the greater laziness of the inhabitants.

I now proceed to give some account of the cultivation of the principal crops mentioned in the preceding paragraphs.

**Rice.**

128. The staple crop of Orissa is rice (oryza sativa) called in Uriya *dhan*. It is grown on 87 per cent. of the total cultivated area viz, on 85 per cent. in Cuttack, on 92 per cent. in Balasore, and on 88 per cent. in Puri, and the distribution within each of these districts may be seen from maps Nos. VI to VIII. In very few villages is less than half of the arable land under rice and it is common to find more than nine-tenths growing this cereal in some form.

The varieties of paddy are very numerous, but they all fall under one of three heads according to the season at which they are sown and reaped.

***Biali*** or autumn rice is the earliest crop and is reaped in August and September.

***Sarad*** or winter rice is sown in June-July and harvested between October and January.

***Dalua*** or spring rice is sown after the floods have subsided and harvested in March-April.



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The winter rice is subdivided according to the amount of water it requires into *guru* or heavy and *laghu* or light varieties and the latter again into small, medium and large*. The following table will show the principle heads of the classification.

| | | | | | |
|---|---|---|---|---|---|
| *Dhan* ... | *Biali.* | ... *Satika* | ... | ... | A large number of varieties known by various names as *champa, kantakuli, nudia* etc., etc., see Appendix H. to Mr. Kingsford's report on Balasore. |
| | | *Bara.* | | | |
| | *Sarad*† | ... *Laghu.* | ... *Chota laghu.* | | |
| | | | *Majhla laghu.* | | |
| | | *Guru.* | *Bara laghu.* | | |
| | *Dalua.* | | | | |

*Biali* rice.

129. The earliest of all the rices is the *satika* variety of the *biali* said to ripen within sixty days of its sowing, while the heavier qualities take a month longer.

These kinds of paddy are always grown on the higher lands of the village and for preference in a light loamy soil, the best yield being from crops raised on the *kala* lands and in favourable years on the *pal* lands also.

The land is ploughed several times as early as possible after February, and then is harrowed and left to mellow in the sun, and with the first rain in June the seed is sown broadcast at the rate of about 30 seers to a maund per acre, manure having been previously spread over the field. Three days later the seed is ploughed in and the land harrowed; a second harrowing is given a fortnight later and the plants are thinned out.

After this the crop requires weeding two or three times, and in August or September is ready to be cut. The reaping is done by men and women with a sickle, and only a few inches of stubble are left on the ground.

*Biali* rice if on high land may be followed by pulses, generally *kulthi* or *birhi*, and on alluvial or homestead lands by mustard, linseed, or *harar*. In rich and irrigated soil or in very favourable seasons *laghu* paddy is also transplanted into the fileds from which the *biali* has been cut. The total area shown in the crop statements under *biali* is 166,900 acres, viz, Cuttack, 128,000; Balasore, 9,200; Puri 29,700.

It is more precarious than the *sarad* crop, being injuriously affected by drought in June and July, but on the other hand, where the *sarad* is spoiled by want of rain in September and October, there may be a bumper crop of *biali*.

It is curious how much more popular this crop is with the cultivators of Cuttack and Puri sudder than in Khurda or Balasore, more than three-fourths of the total *biali* area lying in Cuttack.

*Sarad* paddy.

130. While the autumn rice is always sown broadcast, the winter varieties may be either transplanted or sown at once where they are to grow. As the latter is by far the more popular method I shall describe it first.

Broadcast cultivation.

The lightest of the *laghu* varieties differ but little from *biali*, while the *bara laghu* pass with no very marked line of division into *guru*, but as a rule the *laghu* paddy is grown in moderately low lands, which are wet, or under six inches to a foot of water, pretty continuously from June to October, and likes a fairly stiff soil (*matal*). The crop having been harvested in December the land will either grow a crop of *mung* or millet, or lie fallow until April or May, when it is ploughed as often as the weather and the resources of the cultivator permit, and manure consisting of little heaps of cowdung and refuse is spread over the surface. The number of ploughings depends on the quality of the soil and its elevation, high lands requiring more ploughing than low. Something depends also on the quality of the rice to be grown, the finer varieties needing more careful preparation of the oil. The seed, about 30 to 40 seers to the acre, is sown in the end of May or beginning of June if the weather is favourable, and germinates within fifteen days. Ordinarily it is sown dry, but if the sowing is delayed or there is a superabundance of water, it is first steeped so as to induce partial germination and to prevent it from floating. About a month after sowing, if there is sufficient water in the

* *Chota laghu, majhla lagha* and *Bara laghu.*

† In Balasore the best known divisions of *Sarad* are *asu, nabakanda* and *guru.*

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field, the plough is passed over it so as to thin out the seedlings, now six inches to a foot high. Those that are uprooted and left floating in the water are replaced by hand and grow again readily. This operation, known as *"biushan"* is considered to be of great importance, and it is thought most unfortunate if for want of water it has to be delayed until August.

As soon as the young plants have re-established themselves after this violent disturbance, the harrow is passed over them so as to press them into the mud. This is called the *kala mahi*. A week or ten days later weeding begins, and at the same time any irregularity in the interspacing of the plants is corrected.

Sometimes only one weeding suffices, but good cultivators prefer to have a second weeding a fortnight latter. The plants flower in October or November and the wild paddy (*balunga*) left over from the dropped grains of previous harvests is picked out.

For the first year or two this self-sown paddy is reaped with the rest, but it soon deteriorates and becomes known as *'rashi'*, the grain of which is liable to drop from the ear before harvesting, and the degeneration continues until the plant resembles wild paddy. It has therefore to be separated every two years, and this is often possible by sowing red after white varieties, as they are readily distinguished by the colour of the lower part of the stem and of the girule (*kanta*). Sometimes, too, transplanting is resorted to finally eradicate the *balunga*.

When the ears are full and ripened and before the grain begins to get dry and drop the harvesting begins. Sometimes the standing paddy is first laid low with a bamboo to prevent the grain being scattered by the wind; then the reapers come and with the *dao* or sickle cut off the stalks close to the ground. The cut paddy lies for a few days and then is gathered into larger sheaves which are carried to the homestead by cart or *banghi* and there stacked.

The cultivation of the *Guru* varieties is almost the same, but as they are grown in the heavy clay lands that retain two to four feet of water, less careful ploughing is necessary and manure is more sparingly given, if at all. In very low lands (*jalapat*) no refinements of cultivation are possible, and the seed once sown is, if the land is still dry, ploughed over and harrowed, and if the rains have begun, only pressed in with the harrow and then left, the depth of water being regulated so far as possible by means of the *oils* of the field. The harvesting is done a month later than that of the *laghu* varieties, *i. e.*, in January, and as a rule only the ears are cut, the straw being too sodden to be of value.

**Transplantation.**

131. Transplantation is an unpopular system of cultivation, as it involves more labour and the transplanted seedlings are very delicate for the first month and liable to injury by flood and still more by drought; and a very careful enquiry made by Mr. Arnott, Executive Engineer of the Mahanadi Division, showed only 4 per cent. of the cultivated area to grow transplanted rice. It is, however, admitted that, when successful, transplantation gives a larger yield, and it is resorted to for fields (especially when irrigated) that grow a *sarad* after the *biali* crop, to get rid of the wild paddy, to avoid the risk of loss by early floods, and to replace the loss of the broadcasted crop, if such occurs before the end of July.

The nursery is generally a field near the village well manured and fenced in to keep off jackals and other animals. The seeds may be sown either dry or wet. If the former method be adopted, the field is ploughed while dry as often as possible—not less than five or six times—and the soil carefully pulverised and weeded. Before sowing a little sand in sprinkled on it and the seed scattered and ploughed in. It is then carefully watered until the plants come up.

In the wet method the land must be flooded and then ploughed up until it is of the consistency of a thick gruel. The seeds are soaked for twelve hours in an earthen jar or *handi* and then partially dried in a basket covered with straw, and in this condition are sown broadcast on the sticky surface of the field. In four or five days the plants show themselves and water is then gradually admitted.

When a month old the seedlings are ready to be transplanted into the rice field which has been prepared by ploughing and manuring as for broadcasted paddy, and is once again ploughed and harrowed before the young plants are ready. The seedlings, 6 inches to 18 inches high, are arranged in bunches of three to four and six to nine inches are left between each bunch. The roots are

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carefully imbedded to the depth of a couple of inches; they are then left and require no further attention beyond a good weeding and a copious supply of water.

The earlier the transplanting is done the better the results, and the middle of June to the middle of July is considered the proper time; but the operation often goes on for a month later.

**Dalua.**

132. ***Dalua*** is a coarse variety of paddy grown on lands too heavily inundated to yield *sarad*, and especially in the shallow water round the edges of *jhils* and water-courses. The soil is generally clayey and often saline, for it is a peculiarity of this crop that it is but little affected by the superabundance of saltpetre.

A nursery is selected in a corner of a tank or a drain, and the depth of water is regulated by means of little walls of mud. It is ploughed once or twice and levelled; the seed having been previously steeped for twenty-four hours in an earthen vessel, is placed in a basket and covered with straw for two or three days until it begins to germinate: it is then sown very thickly in the seed bed. The land is prepared to receive it by ploughing in the water until the whole becomes one pulpy mass with an inch or two of water over it. In this the seedlings, when about a foot high, are imbedded, and require to be plentifully supplied with water until they flower. In March or April the crop ripens and is harvested.

Only 36,000 acres are shown in the *khasras* as growing *dalua*, but of recent years there has been a tendency to extent its cultivation in inundated areas with the aid of water supplied by the Irrigation Officers through canalised channels. There is but little *dalua* in Balasore or in Khurda subdivision, and it is only in the low lying lands of north eastern Cuttack and in the heavily-flooded Parganas of Purbaduai and Oldhar in Puri that it forms as staple crop. After the Brahmini floods of 1894 a large area was sown with *dalua* rice in the Bayang Pargana of Balasore, and it is likely to come into favour in the south of the District.

**Threshing.**

133. Two methods of threshing the paddy are followed, the former generally for *biali* and *laghu* paddy, the latter for *sarad* and for *dalua*.

The rice is, in the former case, cut three to six inches from the ground and carried to the threshing floor ( *khala* ), where it is stacked. A plank is then fixed so as to form an inclined plane about three feet high at the upper end. The thresher stands at the head of this plank, and holding a bundle of paddy with the ears away from him strikes it on the plank until the grain falls out on the threshing floor, from which it is afterwards collected.

In the other method, the paddy which has been cut with only a few inches of stalk is spread on the threshing floor and trodden by bullocks yoked to the pole in the centre.

**Winnowing.**

134. The winnowing is done by means of a flat basket ( *kula* ) in which the grain is placed. The basket is lifted by the operator with both hands above his head and shaken from right to left and left to right with a slight vertical motion, so that as the man steps backwards the light and worthless refuse (*achara*) is left suspended in the air and blown away by the breeze. After this has been done for a few minutes the grain is well fanned to blow away the remaining dust and then placed on the top of the heap of paddy ready to be stored.

**Storing.**

135. Paddy is generally stored in bamboo baskets ( *doli* ) plastered over with mud and dung. Often also in pits dug in the yard of the house. Mahajans use small storehouses of mud and wood raised two or three feet from the ground and capable of holding 500 to 1,000 maunds.

**Clean rice.**

136. Rice is prepared from paddy in two ways, viz.:—

(*a*) By drying the paddy in the sun, and then crushing it in the *dhenki*. This is known as *atap* rice;

(*b*) By boiling the paddy, and then drying it in the sun and crushing it in the *dhenki*. This is what is generally eaten, being known as *sidha* rice.

The outer husk of the paddy which is thus removed is called *tunsa* and is used for fuel, whareas the fragments of husks and the outer shell covering the

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grains of rice go by the name of *kunda*, and form a favourite fodder with cattle. Three seers of paddy would yield about quarter seer of *tunsa* and the same quantity of *kunda*.

The work is usually done by women on contract, and 10 *gaunis* of clean dry rice are returned for every 25 *gaunis* of paddy, or sometimes of every 22. This, however, leaves a large margin of profit to the operator, even allowing for the difference in the specific gravity of rice and paddy; and in the returns of the Public Works Department the ratio rice to dry paddy is taken at two-thirds. This result has been verified by experiments made by Mr. Maude and Babu Jamini Mohan Das, but is perhaps rather high, and for the purpose of the calculations in this report, I have taken the proportion of rice to paddy as 5 to 8, the accepted ratio of the Agricultural Department.

Outturn of rice.*

137. Mr. N. N. Banerjei takes the average outturn per acre as 15 to 20 maunds of paddy, which closely corresponds to popular estimate. Roughly, the people classify rice lands as first, second, and third class, according as they are capable of producing 3,2, or 1 *bharan* of paddy. Now a *bharan* is generally about 8 Cuttack maunds, and the area of first class land is certainly no less than that of third class so we may take the popular average at 2 *bharans* or 16 maunds, equal to 10 maunds, (Cuttack weight) of rice; which is approximately correct.

The results of the last ten years' experiments by officers of the Publpic Works Department give an average outturn of 19.72 maunds of paddy on irrigated and 15·59 maunds on unirrigated land. The results of crop experiments of 1895-98 by officers of the Settlement and district staffs gave an average for irrigated land of 1,996 lbs. and for unirrigated of 2,003 lbs.per acre.

Comparing these with the provisional estimate in 1891,§ we get the following :—

| | Weight of clean rice in lbs. per acre. | |
|---|---|---|
| | Irrigated. | Unirrigated. |
| | Mds. | Mds. |
| Irrigation Department, 1885-96 .... .... .... | 1,014 | 802 |
| Estimate submitted to Government of India by Director of the Department of Land Records and Agriculture .... | 1,045 | 902 |
| Settlement and District experiments of 1895-98 .... | 1,247 | 1,252 |
| Average .... .... .... .... .... .... .... | 1,102 | 985 |

This is equivalent to about 13½ standard maunds per acre for irrigated and 12 maunds per acre for unirrigated lands†.

An examination of the returns does not discover satisfactory evidence of any superiority in the yield of transplanted rice over that of broadcast. The outturn of straw varies from 20 to 50 maunds, and may be taken on an average at 25 maunds.

***Biali*** is generally estimated to yield two-thirds of the weight of grain obtained from winter rice, or say 8 maunds of cleaned rice to the acre and about 18 maunds of straw.

***Dalua*** was found by the Inundation Committee to give the largest yield of all, but so much of the field is taken up by the mud walls for regulating the water that I take the outturn per acre as equal to that of ***biali***.

The bye products obtained in the threshing and husking of paddy are the outer husks or ***tunsa*** used for fuel and the bran or ***kunda*** which is a good cattle food.

Mandia. ‡

138. ***Mandia***, the ***marua*** of Bihar, is an upland cereal with a small reddish grain, like a mustard seed. It is grown on high, light, and inferior soils on which ***biali*** rice would hardly succeed.

* See also paragraph 109.

§ Department of Land Records and Agriculture to Government, No. 356A, dated 3rd March, 1898.

† Standard maunds of 822 lbs.

‡ *Eleusine corocana*.



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Sometimes it is sown broadcast in May; more often it is firt sown in seed beds and transplanted in June when the seedlings are six inches to a foot high. The transplanting requires to be rapidly done, as the plants cannot be left out of the ground long. The crop ripens in August-September and yields about 6 to 8 maunds of seed to the acre. This is ground into flour and eaten in cakes or with rice by lower classes. It is said to have the merit of producing such a feeling of satiety that after one full meal a man does not feel inclined to eat again for twenty-four hours.

It requires good rain in June and July, and is liable to be damaged by caterpillars.

This is, perhaps, the commonest cereal after rice in Puri and in Cuttack, in which districts it is grown on some 58,000 acres, and is generally followed by a crop of *kultha*. In Balasore it is rare. Another variety, known as *kakari mandia*, so called because it is supposed to derive sufficient moisture from the dew, is grown as a *rabi* crop on riverside lands, but is less common. It is a late crop, being sown in February and reaped in April, and if the rain is deficient, requires artificial irrigation.

*China* (Panicum miliaceum).

139. *China* is a millet grown as a *rabi* crop on *biali* and *laghu* lands. It is a delicate plant requiring a good rich loam and abundant water. The field selected is generally near a watercourse, and, as soon as the previous crop has been harvested, is ploughed and harrowed three or four times. The *china* is mixed with sand and sown broadcast, and in eight or nine days the plants spring up. Should rain fail, it requires constant irrigation. In three months it is ready to cut, and in a good season may produce 8 maunds per acre; but the crop is very uncertain, and Mr. N. N. Banerjei puts the average at only 3 maunds. It is eaten like rice, and also cooked with milk, but is not common enough to be of great value as a food-grain. The *milan khasra* only shows some 500 acres, but this must be below the mark.

Wheat.

140. Wheat, locally known as *gahama*, is grown to a very small extent on upland fields after rice, and generally on loamy or silt-covered soil. It is sown broadcast in October-November, and reaped in April; and is as a rule left to grow up in the meantime as best it may.

Probably 500 acres, chiefly in the Jajpur Subdivision of Cuttack, are sown with this cereal, but only some 300 acres are recorded in the *khasra*.

Barley.

141. Barley, or *jaba*, is grown on light sandy lands especially in areas exposed to inundation. It is sown broadcast about the 1st of November and is reaped in March. The grain is boiled and eaten whole or made into flour and is said to be very 'cooling'.

Over 500 acres are shown in the *milan khasra* as under barley, and the figure may be taken as approximately correct.

*Kultha*, Dolichus biflorus

142. *Kultha* is at once the commonest and the least valued of the pulses. It is grown on poor lands after *mandia* or autumn rice or on yet higher and more sandy lands which produce no other crop.

The land requires to be ploughed three to six times and harrowed. The seed is then sown broadcast and the *mahi* again passed over it. In February or March the plants are plucked by hand and carried to the threshing floor, where the grain is trodden out by cattle.

Mr. Nathan put the average outturn at 25 to 40 *gownis* or 2½ to 4 maunds, and Mr. N. N. Banerjei at 3½ maunds per acre; but the actual cuttings made (25) give an average of over 10 maunds. We may safely put it at 8 maunds on an average, which is not far off Mr. Arnott's estimate of 100 *gaunis*. It sells at 20 to 30 Cuttack seers per rupee. It is an excellent food for cattle and horses, and in times of scarcity it is boiled and eaten, with or without rice, by the poorer classes, and in 1896-97 it formed the only food of the people in some villages. Its distribution is very general throughout the Province, and I estimate that it is grown on about 80,000 acres.

*Birhi* (Phaseolus radiatus).

143. *Birhi* is a more valuable crop than *kulthi* and is grown by preference after *biali* rice where the land is rich enough. The difference is very marked, for while *biali-birhi* lands are rented at about Rs. 3-2 to Rs. 4-12 per acre, *biali-kulthu* lands rarely pay more than Rs. 2-8 and *mandia kulthu* not more than Rs. 1-9 per acre.

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The cultivation is much the same as for *kultha* which in external habit it resembles, but it grows more luxuriantly and is less affected by weeds, drought, etc.; it requires a good light loamy soil and a fair amount of rain up to the time of flowering in November; after that it wants fine weather. It is plucked in January and the grain is trodden out by cattle.

The yield is about 8 maunds of small round seed in a good year. This is the average of the experiments made. Mr. Arnott's estimate is 6 maunds; Mr. N. N. Banerjei's, 3 maunds. It is given to cattle and eaten as a pulse (*dal*) and sells at 18 to 24 seers to the rupee. It is found chiefly in the inundated tracts in Cuttack and Puri, and is liable to be eaten up by insects if the weather in November be wet and cloudy. Probably there are some 40,000 acres under this crop.

***Muga*** **( Phaseolus mungo ).**

144. *Muga* or *mung* is the commonest *rabi* crop grown on *sarad* lands. There are three main varieties, the *dhara* or *sauri muga* having a light yellow grain, *kara muga* with a dark grain, and *jhai muga* with a whitish grain. The first two are the more valuable, and are sown on *light laghu* or good *biali* land and sometimes mixed with *birhi*. *Jhai muga* is grown on clayey soils after *sarad* rice.

After the preceding crop has been reaped the land is ploughed two or three times and the seeds sown broadcast. It is ready by February or April, according to the time of sowing, and is either plucked or cut with a sickle and taken to the threshing floor. It is trodden out by cattle, and yields 5 to 8 maunds. This is the pulse most largely consumed by the better classes in Orissa; it is not so general in its distribution as *birhi* and *kultha*, being found chiefly in the inundated area and is commonest in south Cuttack and Puri. It may be grown on 20,000 to 30,000 acres in favourable years.

***Harar*** **( Cajanas Indicus ).**

145. *Harar* is a pulse of which two varieties are found in Orissa, the *chaita harar*, also called *pala*, which is sown in *Assin* and harvested in *Chaitra*, and the *deo* or *nali harar* sown in *Jaistha* and harvested in *Magh* or *Pous*. The first variety is the more common, and is grown generally on riverside lands after *biali* paddy. It is sown broadcast or in drills, and is often mixed with *birhi* or *kultha*, which are plucked before the *harar* has attained its full growth. Oftener, however, it is sown by itself, the yield of *kultha* and *birhi* when thus grown being very poor. It flowers in February when the plant is 2 feet to 4 feet high. In April the plant is cut down and the seed beaten out like paddy. The stems are afterwards used for cattle fodder and fuel. The yield is, in a good year, from 8 to 15 maunds* of grain. It is eaten as a pulse, but is said to be very heating. *Deo* or *nali harar* is a variety with a red grain sown on homestead lands in June-July and harvested in December. Its cultivation is the same as that of the *chaita harar*. *Chaita harar* is most largely grown in the Brahmini basin where in the scarcity of 1896-97 it was in many village the only crop that stood between the people and starvation, and is common on the borderland of Cuttack and Puri. The autumn variety is found in western and central Cuttack and in the Puri district. I think that not less than 60,000 acres is annually planted with *harar*.

**Oilseeds-caster.**

146. Of the oilseeds, one of the most important is the castor-oil bean, *gaba* or *jara*, grown on about 2,600 acres.

It is of two varieties, *bai jara*, sown in May and gathered in February or March, and *chuijara*, sown in October and gathered in March. It is a peculiarity of this plant that it will grow on land deeply covered with sand, and it is usually to be found in sandy fields along the banks of rivers, or on homestead lands. If grown in a loamy soil it is sown in drills, but if in deep sand, holes must be made with a dibble until moisture is reached, when the seed is placed at the bottom. It is a prolific bearer, yielding from 100 to 200 *gaunis*, but is liable to be destroyed by caterpillars and insects. The oil is expressed in the common Indian oil mill worked by man or bullock, and the weight of oil obtained is about one-fourth of that of the beans, or from 1 to 2 maunds per acre. It is used by the poorer classes for cooking and for the anointing of their bodies.

**Mustard and Rape.**

147. Mustard ( *sarishu* ) is one of the most valued of the *rabi* crops and is grown on rich loamy soils after *biali* rice. It is commonest in South Cuttack, and the area under

* Mr. N. N. Banerjei gives 4 maunds; Mr. Arnott 100 to 160 *gaunis*. The latter is nearer the mark.

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it is probably over 2,000 acres. For this crop the soil requires to be carefully prepared, and in October the seed is sown broadcast at about 5 or 6 seers per acre. It requires careful weeding and a fairly dry season, and will yield 6 to 8 maunds of seed, worth about Rs. 30. The oil is used for anointing the body and by the well-to-do for cooking.

Linseed.

148. Linseed (*pisi* or *tisi*,) is grown after *biali* on light loamy soils. It is recorded as cultivated in about 3,500 acres, but is often found mixed with *kulthi* or *dhania* (coriander seed).

Til

149. *Til*, locally known as *khasa* or *rasi*, is grown on fairly stiff soils sometimes as a *rabi* but more often as a *biali* crop. The total area recorded under it is only 1,100 acres.

Sugarcane.

150. Sugarcane, or *akhu*, is grown generally on lands near the village and within easy reach of canal irrigation. Mr. Arnott states that it cannot be grown on ordinary rice land, but requires a loamy (*dorosha*) soil.

The field is prepared by manuring at the rate of 500 basketfuls to the acre and ploughing some thirty times in January and February. Cuttings, known as *dhangiru*, are then planted in furrows about 10 inches apart and covered over with earth. When the cuttings have been planted and covered over, the field is irrigated, and the irrigation repeated every two days until the shoots sprout, which takes from fifteen to twenty days. The soil is then loosened and oilcake and mustard oil applied to the roots; the process is repeated after a fortnight and twice more at intervals of a month, the land being irrigated so as to keep it continually moist, sometimes even every two days in the hot weather.

After the fourth application of oilcake, which takes place in May or June, the soil is loosened by pulling a plough through and the land thoroughly weeded. The stems are then wrapped in sugarcane leaves, and ten days later are tied up in a form known as *paholia* from its supposed likeness to a fishing basket. In August another thorough weeding is necessary, and after this the leaves are bound together and the plants tied together in fours to give them more power of resisting a storm. In December the canes are cut down and the juice is extracted. The mills in use are very primitive the commonest being the *kolhua* which is like the oil mill. The *khai* is a better mill, in which the canes are pressed between rollers, horizontal or vertical, turned by hand or by bullocks. The use of the Behea presses is rare. The juice is boiled down in little pans over an ordinary fire in a *chula* and poured off into jars. Sometimes it is refined by the addition of the lime or ashes.

Mr. Arnott takes the cost of cultivation at Rs. 218 per acre, Mr. N. N. Banerjei at Rs. 80 to Rs. 160, while in Balasore Mr. Kingsford estimates the cost (excluding the raiyat's own labour, manure, etc.) at Rs. 67 per acre. The estimates of outturn are equally variable, Mr. Arnott giving the value of the yield at Rs. 300 to Rs. 350 and Mr. N. N. Banerjei at Rs. 80 to Rs. 200. Experiments give an average yield of some 50 maunds of molasses, worth about Rs. 250 per acre.

Cotton.

151. *Kapa*, or cotton, is a crop that is said to be less largely cultivated than in former years, and is now shown in our records as occupying 2,300 acres or $\frac{1}{1000}$ of the cropped area. It is grown generally on homestead lands (*kala*) irrigable from a tank or canal or on rich alluvial soil by the riverside (*pal*).

The soil is carefully ploughed and harrowed in September and kept moist with the help, if necessary, of irrigation until the middle of October, when the seeds are sown in drills and covered over lightly with earth. Before being sown the seed is steeped in water and mixed with cowdung so as to start germination.

The land requires to be kept moist but not wet, and the plant should flower in February and the pods should be ready to gather in April or May.

The outturn is taken at about a maund of cleaned cotton per acre * worth about Rs. 20.

Jute.

152. The cultivation of *nalita* or jute is at present confined almost entirely to the irrigated area in Central Cuttack and Jajpur and to a few Parganas on the Mahanadi. Mr. N. N. Banerjei states that the area under this crop is decreasing, but this does

* Mr. N. N. Banerjei's report, page 88.

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not appear to be the general opinion, and I think that jute is likely to supplant cotton in many places. The present area under jute is shown in our returns as 900 acres. It is most commonly grown on homestead land, but sometimes also on riverside (*pal*) land, where an extra rent has generally to be paid for permission to cultivate it. The seed is sown about May and in June or July the plants have to be thinned out, and later again when the plants are about three feet high the leaves are plucked off, leaving a few at the very top.

In October the plants are ready to cut and are afterwards steeped in water for ten or twelve days until fermentation sets in. The fibres are then drawn out, or the pith beaten out against a platform.

Tobacco.

153. The tabacco plant, commonly called *dhuanpatra* or 'smoke leaf' is one of the most valuable crops grown in the Province. It is shown in the crop statements as grown on 3,400 acres, but in favourable seasons the area planted with it is much larger, and it is on this crop that many villages in southern Cuttack, especially in the Parganas of Saibir, Deogaon, and Sailo, depend for the payment of the rent.

It requires both a rich loamy soil and a plentiful supply of water, and is only raised on the rich silt-covered lands, on the banks of rivers and in the depressions of the big flooded *pats*. A mixture of sand and silt is not unfavourable to its growth, but the finest leaves are obtained on a sandy subsoil with a covering of nearly a couple of inches of pure silt.

The seed is sown in beds about the middle of September, and when about six inches high the seedings are trasplanted. The field to receive them has been carefully prepared by repeated ploughings until the soil is of the consistency of fine powder, slightly moist. In this holes are made and the seedings carefully planted one in each hole, and have to be watered daily for the next three days and three times more on alternate days in the next week. After this, all withered or spoiled plants have to be removed, and the field is watered about once a week for the next month. When the flower-bearing shoot appears it is broken off and a week later the plant reaches maturity. It is cut of at the root and left for a couple of days in the field; the plants are then dried by alternate exposure to the sun and compression in heaps under a mat.

When dry the plants are tied into bundles and placed on dry straw.

The following account of the cost and profits of tobacco cultivation is taken from the report of Babu Jotindra Mohan Sinha who settled rents in the chief tobacco growing area in Cuttack.

| Cultivation in this Pargana— | No. of Plants, |
|---|---|
| The produce of one *gunt* (·04 acre) tobacco land .... .... | 4,096* |
| *Deduct* wastage .... .... .... .... | 512 |
| Net produce .... | 3,584 |

These would make upon an average 100 *mentas* † or bundles, the unit of calculation.

| | | |
|---|---|---|
| 2 *Mentas* | = | 1 *Joda* (couple) |
| 100 *Jodas* | = | 1 *Balad* or bullock load |

The wholesale price of one *balad* varies from Rs. 20 to Rs. 10. The retail price of *menta* varies from one to two annas; so the retail minimum price of 100 *mentas*=100 annas=Rs. 6-4. The wholesale price of 100 *mentas*=50 *joras*= Rs. 6 nearly.

So the price of 100 *mentas*, the produce of one *gunt*, may be taken to be Rs. 6, and that of one *man*=6X25= Rs. 150. But the price of the produce of of one *man* first class *sarad* land taking it to be on an average of 4 *bharans* paddy (at the rate of 16 gownis in the rupee)=Rs. 5×4=Rs. 20 only.

* As a rule 16 plants cover one *Padika*. The number covering a *gunt*=( 16×4 )×( 16×4 )=4,096. Two plants per *padika* are generally deducted for wastage, which therefore amounts to (2×4) (16×4)=512.

† *Menta*=a thin piece of dry bamboo one cubit long, on which the tobacco plants are stuck. The number of plants required to make up a *Menta* depends up on the size of plants, Generally 30 to 40 plants to make up a *menta*, Here 36 plants are taken as a convenient mean.



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The cost of cultivation of one *gunt* of tobacco land amounts to Rs. 2
The rate of rent varies from Rs. 1-8 to As. 4 per *gunt* let us take Rs. 1.
So the total cost per *gunt* = Rs. 2+1 = Rs. 3.
The nett profit per *gunt* = Rs. 6 – Rs. 3 = Rs. 3.
The nett profit per *man* = Rs. 3×25 = Rs. 75.

It is, however, not possible for one man to cultivate more than 6 *gunts* at a time. People having larger areas fit for tobacco sub-let them to neighbours or to the people of other villages in the Pargana.

*Pan.*

154. ***Pan,*** piper betel, is the climbing vine, the leaves of which are used to wrap up the *supari* or areaca-nut chewed by natives of all ranks and castes.

It is an extremely valuable crop, requiring most careful cultivation, and for the most part is grown only by the Barajis, the Baruis of Bengal, who have immigrated in comparatively recent times. In some Parganas, however, I have found *Khandaits,* and indeed all castes but Brahmins, cultivating *pan.* The finest *pan* is raised at Barkud in the Kujang Estate; but there are also valuable gardens in Kodinda close to Cuttack, in Sungra, in Parganas Jajpur and Tisania in Lembai, close to Puri town; also in Sunhaut, Dhamnagar, Bisalkhand, and Bhograi of Balasore.

The total area covered by the gardens is recorded in our papers as 500 acres, but this excludes the permanently-settled estates.

The *pan* garden or *baraj* is formed by heaping up a mound of earth and carefully levelling it. Then the garden is enclosed in trellis work cage about five or six feet high to shield it from the direct rays of the sun. The plants are propagated by cuttings from the tops of old vines which are planted in rows about three feet apart, leaving a couple of inches between each cutting. They are covered with damp straw until they take root, and as soon as they begin to climb a reed called *inkar* is planted beside each and the vine trained to it by ties of *jana* grass.

In six months to a year the plants yield the first crop of leaves, and thereafter about two pairs of leaves every year; the leaves are plucked from the bottom, and every year a further layer of earth is placed over the roots until the plant withers or gets too old, which is at the end of about six years when, it is removed and a fresh cutting planted. In fifteen to twenty years the garden has grown to an unmangeable height and is abandoned, and after lying fallow for a couple of years the earth is used for building other gardens.

The plant requires watering daily in the hot weather, and every two or three days in the cold weather. It is said to suffer from too much rain, and is easily damaged by storms. It is sometimes attacked by the *dauli,* a small white larva, and a black larva, the *kalamukhi* also by insects, such as the *ankulia pokha.*

To the cultivation of *pan* two accessories needed are water and *inkar.* The former is generally to be found in the pond formed by the excavation of earth for the garden. The *inkar* reed is generally grown close by.

The size of a *pan* garden is generally 1,2 or 3 *gunts* and the rent from As. 8 to Rs. 2 per *gunt;* I have found it as high even as Rs. 3 per *gunt.* It is sometimes held on a lease for a fixed period, requiring the rent to be paid, whether *pan* is grown or not, and such are the terms on which *thani* raiyats held under their last settlement *pattas.* More often the lease is for the term of the garden, and the rent is fixed at so much a *gunt* as ascertained by measurement. *Inkar* land is sometimes paid for separately at Rs. 3-2 to Rs. 6-4 per acre but is often allowed rent-free with the garden.

‡ The details are as follows :—

| | Rs. | P. | A. |
|---|---|---|---|
| Ploughing harrowing six times, man with one plough half day each, time As. 6 + As. 3 ... | 0 | 9 | 0 |
| Transplantation, watering, &c, two men one day ... ... ... | 0 | 4 | 0 |
| Watering twice after transplantation, one man one day ... ... | 0 | 2 | 0 |
| Purning &c. ... ... ... ... ... ... ... | 0 | 6 | 0 |
| Cutting, sewing &c, two men one day ... ... ... ... | 0 | 4 | 0 |
| Price of seeding ... ... ... ... ... ... | 0 | 2 | 0 |
| Curing, &c. ... ... ... ... ... ... | 0 | 5 | 0 |
| Total ... | 2 | 0 | 0 |

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The following account of the expenses and profits of *pan* cultivation in Balasore is taken from a note by Mr. Kingsford and shows the expense incurred during the first year, and incidentally the nature and sequence of the processes undertaken :—

The figures given are for 1 *gunt* or ·08 acres of land.

| | Rs. A. P. | Rs. A. P. |
|---|---|---|
| **January to February (*Magh*).** | | |
| Materials— | | |
| Purchase of bamboos .... .... .... | 5 5 0 | |
| Ditto of *inkar* reeds .... .... .... | 6 12 0 | |
| Ditto of *bena* (thatch) .... .... .... | 2 8 0 | |
| Ditto of *nai* (twine) .... .... .... | 1 0 0 | |
| Ditto of thatch .... .... .... | 1 0 0 | |
| Ditto of 2½ maunds of manure .... .... | 2 8 0 | |
| Labour— | | |
| For raising ground .... .... .... | 3 0 0 | |
| Cost of labour for erecting *tatti*, thatch, and supports .... .... | 9 6 0 | |
| For making ridges .... .... .... | 1 2 0 | |
| | | 32 9 0 |
| **February to March *(Phalgun)*.** | | |
| Labour— | | |
| Cutting grafts .... .... .... | 0 6 0 | |
| Transplanting grafts .... .... | 1 2 0 | |
| Covering grafts with straw.... .... | 0 2 0 | |
| Watering twice a day for the month .... | 3 12 0 | |
| | | 5 6 0 |
| | | 37 15 0 |
| **March and April *(Chait)*.** | | |
| Labour— | | |
| Watering once a day .... .... | 1 14 0 | |
| Removing straw and putting earth to roots .... .... | 0 6 0 | |
| | | 2 4 0 |
| | | 40 3 0 |
| **April and May *(Baisakh)*.** | | |
| Materials— | | |
| Forty bundles *inkar* .... .... | 10 0 0 | |
| One load *jana* (a kind of grass used for tying the plants to the *inkar* reeds.... | 1 0 0 | |
| Manure ( applied twice ) .... .... | 0 12 0 | |
| | | 11 12 0 |
| | | 51 15 0 |
| Labour— | | |
| Watering once every four days .... | 0 12 0 | |
| Coolies labour for tying up the plants .... | 3 2 0 | |
| | | 3 14 0 |
| | | 55 13 0 |
| **May to June *(Jaista)*.** | | |
| Labour— | | |
| Coolies for bringing earth and water | 0 14 0 | |
| | | 0 14 0 |
| | | 56 11 0 |
| **June to October *(Asar* to *Kartik)*.** | | |
| Material— | | |
| Manure (twice a month), 12½ *ma'ns* .... | 12 8 0 | |
| | | 12 8 0 |
| | | 69 3 0 |
| Labour— | | |
| Coolies for applying earth and manure twice a month .... | 3 8 0 | |
| Coolies for reparing ridges .... | 1 8 0 | |
| Do. for tending plants .... | 3 12 0 | |
| | | 8 12 0 |
| Carried over .... | | 77 15 0 |

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| | | Rs. A. P. | Rs. A. P. |
|---|---|---|---|
| Brought Forward October to January. | | | 77 15 0 |
| Coolie's labour | .... | 2 9 0 | 2 9 0 |
| | | | 80 8 0 |
| Rent | .... .... | 1 8 0 | 1 8 0 |
| | | | 82 0 0 |
| Material— | | | |
| Baskets and pots for one year | .... | 3 0 0 | 3 0 0 |
| Total cost for first year is, therefore .... | | .... | 85 0 0 |

Of this amount, Rs. 47-13 is the cost of material and rent, and the remainder (Rs. 37-3) is the cost of labour. The subsequent yearly expenditure amounts to Rs. 50, of which Rs. 25 represents cost of manuring, rent, and repairs and Rs. 25 cost of labour. Assuming the cultivator to own an *inkar* plantation, the cost will be considerably reduced. The total expenditure during the life of a garden will accordingly be as follows :—

| | Rs. |
|---|---|
| Cost during the first year .... .... .... | 85 |
| Cost during the subsequent 17 years, viz., 17 × Rs. 50 ... | 850 |
| Total Rs. | 935 |

To turn to the income, in the first place there are 25 rows of plants per *gunt*. The number of plants in each row is 240, and there are, therefore, 6,000 plants per *gunt*. The plant is a creeper with a single stem, from which leaves are thrown out in pairs and at regular intervals. It it therefore easy to gauge the number of leaves fit for plucking every month, and this number may be taken as four. The annual outturn of leaves per *gunt* is therefore $6,000 \times 4 \times 12 = 2,88,000$.

It has been noted that the wholesale price, except in the rainy season, is 1,000 leaves per rupee. In the rains the price falls to 2,000. If the average monthly price be taken as 1,500 (our estimate is somewhat under the mark), the value of the yearly outturn of leaves will then amount to Rs. $\frac{288,000}{1,500}$ = Rs. 192. This estimate takes into consideration liability to ordinary damage.

The outturn during the first year, i. e., for two-and-a-half months from November to January, will be $2\frac{1}{2} \times 6,000 \times 4 = 60,000$, value Rs. 40.

The income for the eighteen years is therefore—

| | Rs. |
|---|---|
| First year ... .... .... | 40 |
| Second to eighteenth year, 17 × Rs. 192 = .... | 3,264 |
| | 3,304 |
| *Deduct*—Total expenditure. .... .... | 935 |
| Total profit | 2,369 |

Which represents an annual income of Rs. 131-10-0 for the eighteen years.

Moreover, this income represents the cost of management (or wages of the *entrepreneur*) only, since expenditure includes the wages of coolie labour. If, as usually happens, the labour is done by the cultivator himself with small occasional assistance from outside, his profit will be larger. Even if we assume that he simply undertakes the duty of management, his profits must be looked upon as extremely high. I have, however, considered this matter with a view of showing that the rent is quite disproportionate to the profit, and that the Baraji stands in a most favourable position compared with that of the ordinary cultivator of *sarad* lands.

The measures locally in use for *pan* gardens are—

| | | |
|---|---|---|
| *26 muthas* | = | *1 aur.* |
| *4 aurs* | = | *1 ganda.* |
| *5 gandas* | = | *1 buri.* |
| *10 buris* | = | *1 gunt.* |
| *25 gunts* | = | *1 man.* |

The *gunt* = ·08 of an acre, or twice the size of a standard *gunt* and the man = 2 acres.

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Brinjals.

155. The cultivation of the brinjal (*Solanum melongena*) locally known as *baigun*, is very general in Orissa, and it is the most important of the garden crops, though the varieties grown are said to be inferior. Seeds are sown in beds of good garden soil at about 11 seers to the acre in June or July, and are covered over with damp straw to promote germination. After eight days the straw is removed and the plants lightly sprinkled with water, and the watering is continued every fourth day for a month or six weeks. The plants are then 6 to 8 inches high and are transplanted. They are placed either in furrows or in small circular pits, the distance from plant to plant being 1½ to 2 feet. After planting they have to be carefully watered until they take root, when the earth is loosened and weeds cleared away. Eight days later the plants are earthed up and left alone, they bear fruit from September to January and the later varieties, from December to March.

The cost of cultivation Mr. Arnott estimates at Rs. 27 per acre, and the selling value of the produce at Rs. 50.

They are liable to be damaged by red ants and by worms (*mandi pokha*). As a preventive ashes are used.

Caladium.

156. The *saru* or caladium (*colocaria antiquorum*) produces a tuber which is very largely eaten by the people. It is grown on rich loamy soils, and often on the banks of rivers. The seed requires to be first prepared by being placed on damp straw and manure. It is sown in furrows on well-manured land in March, and is then irrigated, and the watering continued thereafter every few days. The soil also requires to be periodically loosened and oilcake applied to the roots.

In June the furrows are filled up and a month later the plant comes to maturity.

An alternative and commoner method of propagation is from tubers which are planted in the furrows and watered as in the case of seedlings.

Other varieties of the *saru* are sown or planted as late as May and do not become mature until September.

Mr. Arnott estimates the cost of cultivation at Rs. 43 per acre and the produce at 43 maunds worth at Re. 1-15 per maund, Rs. 80.

Cucumbers.

157. Cucumbers (*kakuri*) of many kinds are grown all over the Province in homestead lands and may be seen climbing over the roofs of the houses in every well-to-do village. When grown as a field crop they generally follow potatoes, onions, or *saru*.

The seeds are wrapped in a peice of cloth and steeped in water for twelve hours; they are then placed in damp straw and covered over with ashes for two days, until they begin to germinate. They are then sown in little circular hollows (*manda*) about three feet apart, two seeds being placed in each *manda*.

They have to be watered regularly, and when the plants begin to grow and send out creepers the *mandas* are joined up by ridges, along which the fruit is produced.

Cucumbers may be grown both as a *biali* and as a *rabi* crop.

Gourds.

158. Several varieties of gourds (*lau*) are grown, and nearly every cultivator has a plant in his homestead, but on a larger scale they are raised for the market on sandy lands by the riverside.

Holes are dug in the sand two or three feet wide and of the same depth, and filled at the bottom with loose earth and cowdung ashes. In this, about October, the seed is sown. The plants germinate rapidly, and send out creepers over the surrounding sand: in November-December they flower, and the fruit is ready for consumption in December or January.

Value of crops.

159. Some account of the value of the crops grown in Orrissa will be found in a later Chapter (Chapter VIII, paragraph 178) on the material condition of the people.



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## CHAPTER VII

### HISTORY OF PRICES.

Sources of information.

160. No attempt is made to do more than give a history of prices of common rice and some comparison between the price of paddy now and sixty years ago. We can find no earlier list than that given on page 1 of Mr. Toynbee's History, where the averages for 1811 to 1817, expressed in standard seers, are—

| | Seers. | | Seers. |
|---|---|---|---|
| For *usnu* rice .... | 49 | For paddy .... | 118 |

The above figures are taken from returns of police *darogas*. Mr. Robert Cornish, in a note on prices in the Balasore District, also tells us in that in 1804 rice sold at 65 seers, but forced sales to Government in that year were made at 57 seers.

Mr. Cornish also found information as to the following years :—

| | Seers. | | Seers. |
|---|---|---|---|
| 1815 .... .... | 78 | 1823 .... .... | 58 |
| 1816 .... .... | 88 | 1824 .... .... | 57 |

In 1828 the price was 48 seers, while in 1831, after the storm-wave, there was a rise up to 32 seers.

The later figures ascertained by Mr. Cornish are to be found separately treated under the Balasore figures.

The following sources of information have been referred to for compilation of information on the subject of prices :—

*For Puri*—

(1) Mr. Nathan's and Mr. Walsh's reports.
(2) Mr. W. C. Taylor's Khurda Rate Reports.
(3) Mr. H. McPherson's report on the Settlement of Puri ( Sadar Subdivision ).

*For Cuttack*—

(4) Mr. Growse's notes of 1896

*For Balasore*—

(5) Mr. Cornish's note of 1893.
(6) Mr. Maddox's No. 869 of 23rd May, 1895.

*For the Province*—

(7) The *Calcutta Gazette* and Government of India returns.

I am indebted to Babu Jamini Mohan Das for a valuable discussion as to the value of the various sources of information. A great deal of what he has written has been reproduced below.

Puri Completion Report—Puri.

161. The Puri report compares the prices in all the three districts.

For Puri we have—(1) prices of paddy compiled from varius sources; (2) average prices of rice from 1861-97, compiled from monthly lists of current prices—and (3) average export (apparently whole sale) prices of rice from 1877-1897.

Up to 1893 the figures in (2) agree exactly with the prices shown in the Manual of the Government of India and both have evidently been taken from the same source. The subsequent prices agree with the prices compiled by me from the *Calcutta Gazette*.

I do not see any reason to doubt the correctness of these prices.

The prices of paddy in (1) are, however, manifestly too low, and should not therefore be relied upon. The popular ratio between rice and paddy is two-thirds.

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except where husking is done at home by the women of the house, when half and half is the expected outturn. The Government of Bengal has accepted $\frac{25}{40}$, which is very nearly equal to two—thirds. Making the most liberal allowance for cost of husking, the quantity of paddy which can be purchased for a rupee should not much exceed double the quantity of rice which can be purchased for the same price. It will be seen that this is very nearly the ratio between rice and paddy in the table of prices given at page 100 of Mr. Toynbee's History of Orissa, Appendix II, and the prices for 1894-97 given by the Kanungos of Cuttack and shown in the table of Cuttack prices in the Puri reports, e. g., in Mr. Toynbee's History, the average price of *usna* rice, expressed in standard seers, is 49 seers per rupee, while that of paddy in the same measure is 118 seers.

The ratio between the prices of paddy and rice in Puri, however, differs very widely from this ratio, the average of paddy in each decade exceeding three times the average of rice. The inference which naturally follows is that the prices shown are not averages of bazar prices ruling throughout the year, but favourable prices obtained either by advances of money or at the reaping season. In the former case the interest of the money advanced should be taken into account, and in the latter case it would be unfair to make such prices the basis for determining the fairness of rent or the material condition of the people, as the people at large cannot always afford to purchase all the food-grain they require at the most favourable season of the year. The whole sale export prices (3) should not, for the same reason be relied upon.

Cuttack

162. The only reliable prices available for the district of Puri are therefore the average shown in the manual of the Government of India. Prices of paddy have been given for a few years only, and all of them would not stand the test referred to above. They may therefore be neglected.

The prices of rice from 1836 to 1857 have been compiled from the Collector's statements of 4th and 27th July 1896, averages having been struck at various figures shown in those statements. But some of those figures appear to be so obviously wrong that they should not be included to affect the average, which would be more correct without them.

In the two statements furnished by the Collector, it is necessary to reject the figures for many years in the early period, whether on account of the measure in which the quantity is expressed, or on account of special prices being recorded for scarcity, or for lack of information as to the time at which the prices were recorded, or because a contract rate was fixed for many years which included years of famine. The following figures supplied by Mr. Growse, the Collector of Cuttack, are accepted as forming a safe basis for Cuttack figures as to prices of common rice, 1836-46 :—

| | 1836 | 1837 | 1838 | 1839 | 1840 | 1941 | 1842 | 1843 | 1844 | 1845 | 1846 | Average. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | S. CH. | S. CH. | S. CH. | S. CH. | S. CH. | S. CH. | S. CH. | S. CH. | S. CH. | S. CH. | S. CH. | S.CH. |
| Magistrate's No. 9 of 6th January 1842. | ... | 24 2¾ | 47 11 | 45 6¼ | 20 14¼ | 26 9¼ | ... | ... | ... | ... | ... | 3215 |
| Magistrate's Contingent Bill Jail charges. | ... | ... | ... | ... | ... | ... | ... | ... | 36 12 | 48 9 | 52 8 | 46 0 |
| Records of Kinu Sau, merchant of Cuttack Town. | 36 12 | 24 15 | 47 13 | 51 2 | 22 8 | 22 8 | 40 0 | ... | ... | 46 10 | ... | 37 0 |

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From 1847-60 the figures given by Mr. Growse may be accepted for Cuttack. They are as follows :—

| | 1847 | 1848 | 1849 | 1850 | 1851 | 1852 | 1853 | 1154 | 1855 | 1856 | 1857 | 1858 | 1859 | 1860 | Average. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | S. CH. | S. CH. | S. CH. | S. CH. | S.CH. | S.CH. | S.CH. | S.CH | S.CH. | S. CH. | S.CH. | S.CH | S.CH. | S.CH. | S. |
| Magistrate's Contingent Register, Jail Chrges. | 61 11 | 61 11 | 63 14 | 74 14 | 77 14 | 61 13 | 56 2 | 48 1 | ... | ... | ... | ... | ... | ... | 63 |
| Prices current, office Copies in Cuttack Collectorate. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 32 6 | 32 0 | ... | ... | 32 |
| Do. of Prices at Brahmanbar *hat*. | ... | ... | ... | ... | ... | ... | ... | ... | 53 0 | 49 10 | 38 3 | 42 0 | ... | ... | 46 |
| Do. of prices current at Patamundai and Chandannagar *hats*. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 30 0 | ... | ... | ... | 30 |
| Do. of prices current at Thana *hat*, pargana Tiran. | ... | ... | ... | ... | ... | ... | ... | ... | 75 0 | 36 0 | 36 0 | ... | ... | ... | 49 |

For 1861 and later periods the lists published by the Government of India are taken.

163. Turning to Balasore, we have a very valuable note by Mr. R. Cornish. The figures which I had collected are for paddy, so that it is not possible to make use of them.

Balasore—Mr. R. Cornish's note.

Mr. Cornish gives us the following prices :—

| Seers. | | Seers. | |
|---|---|---|---|
| 1804 .... 65 | | 1847 .... 54 | (average). |
| 1815 .... 78 | | 1848 .... 60 | (jail contract). |
| 1816 .... 88 | | 1849 .... 63 | (jail contract for 1850). |
| 1828 .... 48 | | 1850 } | |
| 1831 .... 32 | (after the storm-wave). | 1851 } 59 | (average). |
| 1832 .... 27 | | 1852 } | |
| 1833 .... 30 | (average). | 1853 } | |
| 1834 .... 30 | | 1852 .... 36 | |
| 1835 .... 71 | | 1853 .... 48 | |
| 1836 .... 45 | (average). | 1855 } | |
| 1839 .... 35 | | 1856 } 47 | (average). |
| 1840 .... 40 | | 1857 } | |
| 1842 .... 68 | | 1858 .... 25·5 } | Returns of Collector to |
| 1843 .... 50 | (jail contract). | 1859 .... 28·3 } | Famine Commissioner. |
| 1844 .... 72 | | 1860 .... 23·9 } | |
| 1845 .... 60 | | | |

For 1837, 1838, 1841, 1846, 1854 Mr. Cornish has no figures.

Form 1861 onwards the prices published by the Government of India may be accepted as fairly reliable. The prices in each District are checked by those ruling in the other two since the great famine. Owing to the great improvement in communications, prices have moved very nearly within the same proportion from year to year. From 1894-98 these figures must be supplemented by figures published in the *Calcutta Gazette*.

The figures which are recorded below are, therefore, mainly derived from the printed notes of the Collectors of Cuttack and Balasore.

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Averages worked out from the statistics compiled from the *Calcutta Gazette* agree very nearly with the Government of India figures, which were probably compiled from the same source.

164. From the above-mentioned sources we obtain the following information:—

*Statement showing the average price of common rice in Orissa.*

| Year.* | Annual average price in seers (of 80 tolas) per rupee. | Decennial average. | Year | Annaual average price in seers (of 80 tolas) per rupee. | Decennial average. |
|---|---|---|---|---|---|
| 1836 .... | 43·13 | | 1867 .... | 16·37 | |
| 1837 .... | 24·56 | | 1868 .... | 31·27 | |
| 1838 .... | 47·75 | | 1869 .... | 24·14 | |
| 1839 .... | 48·85 | | 1870 .... | 29·71 | |
| 1840 .... | 21·16 | | 1871 .... | 29·66 | |
| 1841 .... | 24·50 | 43·20 and | 1872 .... | 28·47 | 26·87 |
| 1842 .... | 54·00 | 48·14 excluding | 1873 .... | 32·43 | |
| 1843 .... | 50·00 | 1837 and 1840. | 1874 .... | 24·37 | |
| 1844 .... | 54·37 | | 1875 .... | 35·61 | |
| 1845 .... | 53·75 | | 1876 .... | 26·72 | |
| 1846 .... | 52·50 | | 1877 .... | 17·65 | |
| 1847 .... | 57·87 | | 1878 .... | 13·70 | |
| 1848 .... | 59·56 | | 1879 .... | 15·69 | |
| 1849 .... | 61·94 | | 1880 .... | 20·59 | |
| 1850 .... | 67·19 | | 1881 .... | 30·38 | |
| 1851 .... | 68·89 | | 1882 .... | 29·98 | 21·26 |
| 1852 .... | 54·75 | 57·94 | 1883 .... | 26·70 | |
| 1853 .... | 55·19 | | 1884 .... | 19·86 | |
| 1854 .... | 53·81 | | 1885 .... | 18·34 | |
| 1855 .... | 55·50 | | 1886 .... | 19·77 | |
| 1856 .... | 44·94 | | 1887 .... | 22·09 | |
| 1857 .... | 40·56 | | 1878 .... | 20·99 | |
| 1858 .... | 31·25 | | 1889 .... | 17·08 | |
| 1859 .... | 28·31 | | 1890 .... | 1..·68 | |
| 1860 .... | 23·87 | | 1891 .... | 18·57 | |
| 1861 .... | 33·18 | | 1892 .... | 13·39 | |
| 1862 .... | 32·84 | 28·58 | 1893 .... | 14·78 | 18·28 |
| 1863 .... | 30·29 | | 1894 .... | 15·68 | |
| 1864 .... | 33·87 | | 1895 .... | 21·63 | |
| 18·5 .... | 21·90 | | 1896 .... | 18·40 | |
| 1866 .... | 9·76 | | 1897 .... | 11·87 | |
| | | | 1898 .... | 14·84 | |

*1836-60 compiled from the printed notes of the Collectors of Balasore and Cuttack. 1861-93 compiled from the prices published by the Government of India. 1894-98. compiled from the *Calcutta Gazette*.

**Averages for 15 years :—**

| | | | |
|---|---|---|---|
| 1837-51 | ... | ... | 49.77 |
| 1852-66 | ... | ... | 42.67 |
| 1867-81 | ... | ... | 24.85 |
| 1882-66 | ... | ... | 19.79 |

**Prices of paddy.**

165. As I have already shown, it is very difficult to get authentic information regarding prices of paddy. Mr. Nathan and Mr. Walsh obtained information in Puri from certain *maths* and private persons, and I obtained information from zamindars and others in Balasore for about sixty years. I give the following extract from Messrs. Nathan and Walsh's figures and my own to show that our figures justified almost



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the same enhancement on the ground of rise in prices, though they obtained figures in the south of the Province, and mine were obtained from the north :—

| | Period. | Price of paddy per maund in seers of 80 tolas. | Period. | Price of paddy per maund in seers of 80 tolas | Percentage of increase in prices. |
|---|---|---|---|---|---|
| | | Rs. | | Rs. | |
| I. Mr. Nathan's and Mr. Walsh's figures for Puri | 1836-45 | 0·18 | 1883-92 | 0.60 | 233 |
| II. Mr. Maddox's figures for Balasore | -do- | 0·29 | 1885-94 | 0·92 | 217 |

The enhancement on the ground of rise in prices is worked out by Mr. W. C. Macpherson as follows :—

I. 1:2. 55 as 100:255; or 155 per cent.

II. 1:2. 45 as 100:245; or, 145 per cent.

As regards the price of paddy between 1836 and 1845, I may add that Mr. W. C. Taylor's average price given in Khurda Selections, Volume II, page 114, exactly agrees with mine.

It will be seen by the comparison made in paragraph 43 of my covering report to Mr. J. Taylor's report on the Settlement of Khurda that in Khurda prices throughout the country have ruled higher than in the Puri Sadar subdivision. This is probably due to the large export by road and to the frequency of the Ganjam famines.

166. In accordance with Circular No. 10 of 12th February, 1898, issued by me to Assistant Settlement Officers, Chakla Kanungos were summoned before them with the registers in which prices had been recorded by the Kanungos under Board's Circular No. 6 of June, 1838. The original registers having been produced, extracts for prices from 1887 to 1896 were recorded, signed, sealed, and attested by the Kanungos in the Assistant Settlement Officer's presence, and after counter-signature by the Assistant Settlement Officers have been sent to headquarters. These returns have been bound in registers and are to be made over to the Collector of each District. It is hoped that at a future Settlement these lists may give evidence of prices in local areas.

The general results are recorded as follows :—

*Statement showing the price of Common rice from 1887 to 1896 in seers (80 tolas) to the rupee.*

| NAME OF OFFICER. | Name of Chakla | 1887. | | | 1888. | | | 1889. | | | 1890. | | | 1891. | | | 1892. | | | 1893. | | | 1894. | | | 1895. | | | 1896. | | | AVERAGE FOR DECENNIAL PERIOD (1887 To 1896). |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. | January. | June. | September. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
| | | DISTRICT CUTTACK. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Babu Hira Lal Banerji | Kendrapara | 26 | 25 | 25 | 20 | 26 | 25 | 21 | 16 | 18 | 24 | 21 | 24 | 26 | 21 | 18 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 12 | 12 | 24 | 24 | 26 | 26 | 25 | 18 | 23 | 20 | 20 |
| James Taylor, Esq. | ..... | 24 | 21 | 21 | 25 | 20 | 19 | 21 | 16 | 21 | 22 | 18 | 20 | 21 | 18 | 17 | 16 | 12 | 13 | 16 | 13 | 13 | 17 | 12 | 14 | 20 | 20 | 21 | 25 | 18 | 15 | 21 | 17 | 17 |
| Babu Gobind Chandra Das Gupta. | ..... | | | | | | | | | | | | | | | | | | | | | | 18 | 17 | 17 | 11 | 13 | 22 | 21 | 33 | 30 | 25 | 20 | 17 | 19 | 19 |
| Babu Nabin Chandra Kar. | Barchana Baruan | | | | | | | | | | | | | | | | | | | | | | | 15 | 13 | 12 | 25 | 21 | 20 | 32 | 21 | 20 | 19 | 18 | 18 |
| Babu Beni Madhav Chatterji. | Balikuda | 38 | 32 | 31 | 32 | 27 | 30 | 30 | 25 | 30 | 30 | 25 | 25 | 30 | 25 | 30 | 25 | 30 | 16 | 16 | 12 | 20 | 19 | 13 | 12 | 22 | 15 | 25 | 30 | 30 | 25 | 27 | 23 | 16 |
| Maulvi M. Choinuddin. | Biribati | | | | | | | | | | | | | | | | | | | | | | | 17 | 13 | 16 | 22 | 22 | 25 | 25 | 22 | 15 | 21 | 19 | 19 |
| Babu Sriram Chandra Bose. | Jagatsingpur | | | | | | | 16 | 22 | | | | | | | | 20 | 13 | 14 | 16 | 13 | 16 | 18 | 13 | 13 | 21 | 21 | 20 | 28 | 25 | 18 | 21 | 21 | 22 |
| Babu Jagabandhu Ghose. | Gopalpur. | | | | | | | | | | | | | | | | | | | | | | 18 | 17 | 17 | 11 | 13 | 22 | 21 | 23 | 30 | 25 | 20 | 17 | 19 | 19 |
| Babu Phonindranath Mukherjee. | Sonpur. | | | | | | | | | | | | | | | | | | | | | | | | 12 | 14 | 21 | 21 | 27 | 27 | 27 | 15 | 16 | 20 | 19 |
| Jagannath Dutta Babu Shyama Charan Sen. | Pandalo. | 26 | 21 | 23 | 25 | 21 | 25 | 32 | 26 | 29 | 30 | 23 | 29 | 24 | 21 | 24 | 13 | 11 | 15 | 17 | 16 | 21 | 19 | 17 | 13 | 16 | 22 | 21 | 18 | 22 | 26 | 21 | 17 | 23 | 19 | 22 |

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| NAME OF OFFICER. | Name of Chakla. | 1887. January. | 1887. June. | 1888. September. | 1888. January. | 1888. June. | 1889. September. | 1889. January. | 1890. June. | 1890. September. | 1891. January. | 1891. June. | 1892. September. | 1892. January. | 1893. June. | 1893. September. | 1893. January. | 1894. June. | 1895. September. | 1895. January. | 1895. June. | 1896. September. | 1896. January. | 1896. June. | AVERAGE FOR DECENNIAL PERIOD (1887 to 1896). September. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
| **DISTRICT CUTTACK—*Concld.*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Babu Shyama Charan Sen. | Tirtol | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 24 | ... | ... | 14 | 16 | 13 | 16 | 20 | 14 | 15 | 23 | 22 | 26 | 29 | 24 | 20 | 22 | 18 | 29 |
| Babu Satis Chandra Guha. | Tendakura | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 17 | 13 | 11 | 20 | 20 | 22 | 30 | 25 | 16 | 22 | 19 | 16 |
| | Nayagaon | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 | 12 | 24 | 15 | 15 | 15 | 18 | 14 | 15 | 24 | 24 | 20 | 11 | 11 | 11 | 16 | 15 | 18 |
| Babu Amritasikher Mukherjee. | ..... | ... | ... | ... | ... | ... | ... | 16 | 20 | 21 | 20 | 20 | 21 | 20 | 16 | 17 | 13 | 14 | 13 | 15 | 12 | 15 | 20 | 12 | 13 | 24 | 20 | 24 | 26 | 22 | 16 | 18 | 17 | 17 |
| Babu Debendra Prasad Ray. | Jagatsing-pur | ... | ... | ... | ... | ... | ... | 16 | 22 | ... | ... | ... | ... | ... | ... | ... | 20 | 13 | 14 | 16 | 13 | 16 | 18 | 13 | 13 | 24 | 24 | 24 | 28 | 21 | 20 | 24 | 19 | 19 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 13 | 21 | 21 | 26 | 28 | 26 | 18 | 20 | 22 | 22 |
| Babu Jamini Mohan Das. | Jajpur | 29 | 25 | 29 | 26 | 26 | 26 | 21 | 17 | 18 | 22 | 16 | 17 | 21 | 14 | 16 | 21 | 16 | 16 | 17 | 18 | 16 | 26 | 12 | 11 | 21 | 20 | 22 | 26 | 24 | 16 | 22 | 19 | 19 |
| Babu Khitish Chandra Sarkar. | Tirtol | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 | 14 | 16 | 13 | 16 | 20 | | 14 | 16 | 24 | 22 | 26 | 29 | 24 | 20 | 18 | 17 | 18 |
| | Tendakura | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 17 | 18 | 11 | 20 | 20 | 22 | 30 | 25 | 16 | 22 | 19 | 16 |
| Babu Hiralal Banerjee. | Bahugram | 34 | 34 | 40 | 34 | 34 | 40 | 34 | 34 | 53 | 58 | 52 | 40 | 53 | 53 | 53 | 35 | 33 | 32 | 40 | 35 | 32 | 38 | 21 | 20 | 40 | 35 | 43 | 49 | 39 | 35 | 41 | 47 | 38 |
| Babu Jatindra Mohan Sinha. | ..... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 13 | 16 | 22 | 22 | 25 | 25 | 22 | 16 | 16 | 19 | 19 |
| Babu Beni Madhab Chatterjee. | Jaganatha-pur | ... | ... | ... | 33 | 30 | 28 | 18 | 17 | 23 | 24 | 18 | 22 | 26 | 24 | 20 | 20 | 12 | 14 | 24 | 18 | 14 | 21 | 16 | 14 | 23 | 26 | 30 | 30 | 22 | 21 | 23 | 19 | 21 |
| Babu Jamin Mohan Dass. | Patamundai | ... | ... | ... | ... | ... | ... | 29 | 21 | 21 | 27 | 23 | 26 | 26 | 26 | 24 | 21 | 14 | 13 | 21 | 18 | 18 | 19 | 12 | 12 | 21 | 24 | 24 | 26 | 28 | 21 | 25 | 22 | 21 |
| | Chandol | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 21 | 18 | 22 | 18 | 12 | 14 | 16 | 16 | 16 | 17 | 11 | 13 | 20 | 16 | 16 | 16 | 16 | 15 | 18 | 15 | 16 |
| Babu Sriram Ch. Bose | Anantapur | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 16 | 19 | 18 | 14 | 12 | 23 | 22 | 24 | 28 | 27 | 22 | 18 | 20 | 19 |
| **DISTRICT BALASORE.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Babu Debendra-natha Bose. | Kamarda | 34 | 24 | 29 | 30 | 30 | 29 | 22 | 20 | 16 | 24 | 19 | 20 | 24 | 20 | 20 | 20 | 16 | 14 | 16 | 15 | 14 | 21 | 17 | 15 | 24 | 23 | 28 | 26 | 26 | 18 | 24 | 22 | 20 |
| | Bhadrak | ... | ... | ... | 32 | 26 | 24 | 20 | 21 | 21 | 21 | 20 | 17 | 23 | 21 | 16 | 20 | 13 | 15 | 16 | 15 | 16 | 22 | 10 to 15 | 15 | 22 | 25 | 27 | 30 | 24 | 18 | 23 | 20 | 19 |
| Babu Harakrishna Mohanty. | Dolesahi | 32 | 26 | 26 | 26 | 28 | 26 | 24 | 18 | 18 | 18 | 19 | 17 | 24 | 21 | 21 | 21 | 14 | 14 | 16 | 16 | 16 | 11 | 13 | 13 | 22 | 22 | 25 | 32 | 25 | 21 | 23 | 20 | 20 |
| | Dhamnagar | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 | 21 | 21 | 26 | 26 | 25 | 22 | 16 | 16 | 20 |
| | Agarpara | 30 | 30 | 30 | 30 | 26 | 21 | 25 | 20 | 20 | 23 | 22 | 20 | 24 | 19 | 19 | 21 | 15 | 14 | 16 | 16 | 16 | 15 | 20 | 15 | 16 | 23 | 24 | 32 | 32 | 28 | 28 | 24 | 21 |
| | Chandbali | 28 | 26 | 24 | 24 | 24 | 24 | 21 | 19 | 19 | 19 | 19 | 21 | 20 | 16 | 16 | 22 | 12 | 14 | 16 | 13 | 14 | | 12 | 10 | 20 | 20 | 20 | 20 | 20 | 16 | 20 | 19 | 17 |
| Babu Abhay Prasad Das. | Basudebpur | 27 | 28 | 27 | 29 | 16 | 26 | 21 | 21 | 18 | 27 | 23 | 22 | 21 | 14 | 23 | 18 | 16 | 18 | 17 | 15 | 16 | 21 | 23 | 14 | 32 | 25 | 29 | 13 | 12 | 25 | 22 | 19 | 22 |
| | Balasore | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 | 16 | 12 | 14 | 12 | 16 | 20 | 20 | 19 | 28 | 16 | 16 | 20 | 20 |
| **DISTRICT PURI—SUBDIVISION.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H. McPherson, Esq., I. C. S. | Pipli | 26 | 22 | 21 | 26 | 24 | 21 | 21 | 12 | 18 | 25 | 21 | 21 | 21 | 21 | 17 | 17 | 12 | 11 | 12 | 11 | 17 | 18 | 16 | 12 | 21 | 21 | 24 | 26 | 24 | 18 | 21 | 18 | 18 |
| | Nagpur | 26 | 26 | 24 | 24 | 24 | 21 | 26 | 18 | 16 | 24 | 21 | 18 | 24 | 24 | 21 | 14 | 12 | 11 | 17 | 13 | 13 | 18 | 14 | 14 | 23 | 26 | 26 | 34 | 26 | 18 | 23 | 29 | 18 |
| | Kotdes | 26 | 21 | 24 | 21 | 21 | 18 | 24 | 17 | 17 | 26 | 20 | 23 | 28 | 21 | 21 | 14 | 12 | 11 | 16 | 12 | 17 | 20 | 25 | 26 | 29 | 25 | 26 | 20 | 25 | 17 | 23 | 20 | 20 |
| | Kakatpur | 33 | 28 | 21 | 21 | 17 | 27 | 21 | 16 | 16 | 21 | 13 | 21 | 25 | 23 | 23 | 13 | 8 | 12 | 16 | 12 | 12 | 20 | 14 | 14 | 21 | 24 | 24 | 26 | 26 | 17 | 22 | 19 | 19 |
| Babu Akhoy Kumar San | Rahang | ... | 22 | 21 | 21 | 21 | 18 | 18 | 12 | 16 | 21 | 20 | 21 | 21 | 20 | 17 | 18 | ... | 11 | 14 | 14 | 14 | 17 | 13 | 14 | 21 | 21 | 21 | 26 | 21 | 18 | 18 | 16 | 17 |
| | Kaunas | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 16 | 16 | 21 | 24 | 24 | 28 | 24 | 18 | 16 | 21 | 19 |
| | Gope | 26 | 25 | 21 | 21 | 25 | 18 | 24 | 12 | 16 | 24 | 18 | 18 | 17 | 21 | 21 | 14 | 16 | 11 | 17 | 16 | 17 | 21 | 16 | 13 | 21 | 22 | 24 | 20 | 24 | 17 | 21 | 21 | 18 |
| | Bramgir | ... | ... | ... | ... | ... | ... | ... | ... | ... | 22 | 22 | 22 | 23 | 23 | 23 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 | 16 | 23 | 23 | 23 | 20 | 20 | 20 | 19 | 19 | 19 |
| **DISTRICT PURI—KHURDA SUBDIVISION.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| James Taylor, Esq. | Banpur | ... | ... | ... | 40 | ... | ... | 27 | ... | ... | 49 | ... | ... | 41 | ... | ... | 22 | ... | ... | 32 | ... | ... | 33 | ... | ... | 44 | ... | ... | 38 | ... | ... | 36 | ... | ... |
| | Genkia | ... | ... | ... | 42 | ... | ... | 31 | ... | ... | 47 | ... | ... | 41 | ... | ... | 31 | ... | ... | 33 | ... | ... | 34 | ... | ... | 48 | ... | ... | 48 | ... | ... | 39 | ... | ... |
| | Dandimal | ... | ... | ... | 47 | ... | ... | 37 | ... | ... | 43 | ... | ... | 44 | ... | ... | 29 | ... | ... | 30 | ... | ... | 28 | ... | ... | 45 | ... | ... | 44 | ... | ... | 39 | ... | ... |
| | Begunia | ... | ... | ... | 41 | ... | ... | 31 | ... | ... | 48 | ... | ... | 45 | ... | ... | 33 | ... | ... | 32 | ... | ... | 32 | ... | ... | 51 | ... | ... | 18 | ... | ... | 40 | ... | ... |
| | Kkurda | ... | ... | ... | 41 | ... | ... | 32 | ... | ... | 41 | ... | ... | 14 | ... | ... | 24 | ... | ... | 30 | ... | ... | 30 | ... | ... | 43 | ... | ... | 44 | ... | ... | 37 | ... | ... |

**Prices of other commodities.**

167. A list of wholesale prices prevalent in the mufassal between the years 1811 and 1817 is given in Appendix III, at page 100 of Mr. Toynbee's History of Orissa, and it will be interesting to compare it with present prices as given in Appendix O to this report. This is done for a few of the commoner articles of merchandise in the following table :-

| Name of article. | Average of 1811 to 1817 per standard maund. Rs. | A. | P. | Price in 1899 (average per standrd maund). Rs. | A. | P. |
|---|---|---|---|---|---|---|
| *Birhi* .... | 0 | 15 | 6 | 2 | 4 | 6 |
| *Harar* .... | 1 | 14 | 6 | 2 | 12 | 0 |
| *Salt* .... | 3 | 4 | 0 | 3 | 10 | 0 |
| *Ghi* .... | 15 | 0 | 0 | 33 | 0 | 0 |
| Cotton yarn .... | 43 to 85 | 0 | 0 | 16 | 0 | 0* |
| | | | | 40 | 0 | 0 |
| Sugar .... | 8 | 8 | 0 | 4 to 8 | 12 to 8 | 0† to 0‡ |
| Betelnuts .... | 7 | 0 | 0 | 7 | 0 | 0 |
| Tobacco .. | 5 | 0 | 0 | 15 | 0 | 0 |
| Lamp Oil .... | 9 | 10 | 0 | 5 | 0 | 0 |
| Cocoanut oil .... | 21 | 8 | 0 | 15 | 8 | 0 |

* Foreign. † Molasses. ‡ Refined White.

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This list shows a great rise in the price of agricultural produce, pulse, ghee, and tobacco; while cotton yarn and oil have cheapened, and there is but little change in sugar, salt, or in the betelnut which every Uriya chews. Thus the cultivating classes gain both on the better price they get for their surplus produce and the smaller price paid for their imported luxuries.

## CHAPTER VIII.

### MATERIAL CONDITION.

**The character of the Uriya.**

168. Abul Fazl considered the Uriya to be very effeminate, and early writers such as Stirling and Ker describe what they term the intellectual dulness of the Uriyas. Stirling concludes his remarks by saying :—

"In justice, however, to the bulk of the agricultural population, it must be said that the raiyats of Cuttack are exteremely industrious, though they work with little spirit or intelligence and altogether the O orias of the plains, whatever their faults, are certainly the most mild, quiet, inoffensive, and easily managed people in the Company's provinces."

He also mentions—

"The Balasore bearers, in whom the virtues of fidelity and honesty (according to their own conceptions of those qualities) are conspicuous".

These early impressions have never been eradicated and to this day Orissa is by general consent the Boeotia of Eastern India.

This low opinion of the Uriya is not wholly without justification, but it is equally certain that there is much to be said on the other side and the following criticism taken from paragraph 34 of the report of the Famine Commissioners of 1866 holds good to the present day :—

"The people of Orissa are also separate and distinct, of a character and language peculiar to themselves. Their personal character has been a subject of much discusssion during our enquiry and opinions are much divided about it. The Oriyahs are, we should say, physically somewhat larger boned and not so slight.looking as the average Bengali though they would be at a disadvantage compared with other Indian races. Their features are on the whole good, and both features and language indicate that they are to a great degree Aryan in race. Most of them are very Hindu in religion and have much caste prejudice. The truth respecting their character is probably to be found between the two extremes of opinion. They seem to be certainly less quick and pushing than the Bengalis, and the higher classes have had much less education, it may almost be said no education; in fact, they are altogether more Boeotian. On the other hand, we do not see reason to believe that they are in their own way less industrious, they have a certain intelligence of their own, and are thought to be less skilled in fraud and in some respects more reliable. They come freely to Calcutta for service, and may be said to bear a good character there. In short, those who are accustomed to them and have become habituated to their obstinate and prejudiced ways, generally like them; those who are not accustomed to them cannot endure them. The well known Uriya bearer, so common in the European domestic service of Lower Bengal, is probably a very fair type of his country men."

The labouring classes and the lower castes of cultivators are somewhat stupid; but for that matter the peasant of Bihar or of Western Bengal is but little, if at all, cleverer, and physically is certainly inferior. The Brahmans are obstinate and bigoted, but they are of a refined and intellectual type, and the Mahantis of the Mahanadi valley have quite as high a reputation for acuteness as the Lalas of Bihar. In our work we have had no difficulty in finding hundreds of vernacular knowing muharrirs, writing a good Uriya hand, fair arithmeticians, and for the most part careful and not unintelligent. Some of these men have shown considerable ability and a most creditable capacity for methodical work, and have been found perfectly reliable.

Even, however, among the literate class, the want of enterprise, the slowness, and the hopeless conservatism are in marked contrast to the versatility and quickness of their Bengali cousins. An Uriya can hardly be made to hurry himself, and he regards absence without leave and disregard for orders as the most venial of offences. He would as a rule far rather make Rs. 12 a month by a moderate amount of work than half as much again by staying over time. The same love of ease and dislike of hard work permeates all classes. When times were hard and numbers of agriculturists were driven to do earth-work on the railway, they might easily have earned four annas or more a day, but as a rule they would only make two annas or three annas, and then would go home for a rest two days in the week.

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There is no doubt that the last century of unrest and oppression by the Moghuls and specially by the Mahrattas, before the British accession, made some permanent effect in the Uriya character. To sow year after year without knowing by whom the fruits would be gathered, to be continually harried and plundered must necessarily discourage thrift and promote improvidence. For this reason it seems to me that in his own country at any rate the Uriya is not disposed to be a hard worker. Outside Orissa, as domestic servants, chuprassies, and coolies, the Uriyas have a reputation for good work, which may in part be accounted for by the natural selection of the best of the young men as emigrants and their natural fitness for the duties in which they are commonly engaged, and in part also to the unfitness of the Bengali.

We find the Uriya cultivating the lands of well-to-do Bengalies, who themselves are engaged in the jute trade or in selling dairy products in Calcutta. We find them as carpenters, making doors, boxes and tables, as pullers of punkhas, as dockyard labourers, as *palki* beareas, and generally in most kinds of labour requiring more physical than mental capacity.

Generally speaking, the people are kindly and good humoured, remarkably law-abiding, and given only to the committing of the pettiest of crimes. A contractor, employing large numbers of labourers from all parts of the country, put the difference between the Uriya and the up-country man in these terms: "If I give an advance to an up-country man, he will first think how he can cheat me out of part of it. If he gets a chance, he will decamp with the money; if not, he will try to get inferior work passed. The Uriya on the other hand will, sooner or later, work off the value of the advance, but without the slighest consideration for the time within which the work should have been completed."

Physically, the men of the better castes are well-made, with good shoulders and straight backs. Except among the Brahmans and the naturalised Bengalis, infant marriage is unknown, and the last census showed only 1·93 per cent. of girls under ten to be married. In most castes widows may re-marry, and even among Brahmans and Karans do not lead the hard life that they do elsewhere.

**Population.**

169. The consequence of this marriage system is seen in the rapid development of the population, which in 1872 was returned at 30,34,690, and in 1891 had increased to 38,77,294, or by 28 per cent. At a moderate estimate, the population must in the last eight years have increased by 8 per cent. and may be taken at 42,00,000, viz :—

| | Males. | Famales. | Total. |
|---|---|---|---|
| Cuttack. .... | 1,020,000 | 1,080,000 | 2,100,000 |
| Balasore. .... | 520,000 | 560,000 | 1,080,000 |
| Puri .... | 510,000 | 510,000 | 1,020,000 |

Of these we may take to be Hindus 4,090,000; to be Mahomedans 98,000; to be Christians 4,000; leaving 8,000 to be divided between Parsis and other denominations.

**Occupation.**

170. The following table, showing the distribution of the people according to their occupation, has been prepared from the census returns, making due allowance for the increase of population :—

| Name of District. | Class A. Government. | Class B. Pasture and Agriculture. | Class C. Personal service. | Class D. Preparation and supply of Materials. | Class E. Commerce, Transport and Storage. | Class F. Professional. | Class G. Indefinite and Independent. |
|---|---|---|---|---|---|---|---|
| Cuttack ... | 37,000 | 1,126,000 | 125,000 | 373,000 | 46,000 | 67,000 | 334,000 |
| Balasore ... | 10,000 | 826,000 | 22,000 | 95,000 | 10,000 | 16,000 | 100,000 |
| Puri ... | 13,000 | 561,000 | 44,000 | 200,000 | 12,000 | 43,000 | 147,000 |
| **Total ...** | 60,000 | 2,513,000 | 191,000 | 668,000 | 68,000 | 126,000 | 581,000 |

These figures are but an approximation, but they are not likely to be far out. The most striking feature of them is the very much larger proportion of the population returned as agricultural in Balasore than in the other two districts, and the smaller number of persons engaged in manufacture, such as weavers and brass founders. In Balasore it is to be noted the culturable area is still comparatively more extensive than in the other districts.



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**Education.**

171. As to education it may be assumed that the Karans and Kayesths, who form about 4 per cent. of the people, can all read and write, and so can all those in classes A and F, and most of class E. The census returns showed the proportion of literate persons and pupils as altogether 6·7 per cent. of the population, and with the impulse given to reading and writing by the settlement it is probable that the percentage is increasing fast.

The census figures of 1891 showed that of males between the ages of 19 and 46,85 per cent. were married, 4 per cent. widowed, and 11 per cent. unmarried, and of women between the ages of 15 and 49 only 3 per cent. were unmarried, 77 per cent. married and 20 per cent widows.

**Material condition.**

172. It is very difficult indeed to get any accurate understanding of the material prosperity of the people at large. Enquiries at once put the villager on his guard, and he makes such answers as he thinks will conduce to his gain, without any great regard for the truth. The general opinion of the officers who have for years worked among the people and gained their confidence is that 80 per cent. of the rural population are more or less permanently indebted to the ***mahajan***, proprietary tenureholder, or zamindar. The remainder are themselves landed proprietors, or have other means of maintenance than agriculture. It does not, however, follow that because the villager is in debt and has no capital or savings to meet the strain of a bad season that he is very much to be pitied. The ***mahajan*** is almost always a local man, and generally the tenant cultivates the fields over which the ***mahajan***, has a lien. Again, the proprietary tenureholders are local men, and frequently have stocks of grain. Advances of grain for food and seed are not infrequently given by zamindars, especially in times of scarcity, and are repaid by return of the principal with 25 per cent. interest when there is a sufficient crop. Such conditions, however, become oppressive when for two years in succession there is scarcity. The Uriya cultivator is content with very little and that he generally gets. A full meal of rice once a day, taken with a little salt, some pulse or vegetables, and perhaps fish, suffices him, and he eats cold in the morning what is left over from his evening repast. Animal food is a luxury, but well-to do men eat a little mutton and goat's flesh, and all classes eat game whenever they have the luck to kill any. The poorest classes take to supplement their rice boiled ***kulthi*** and ***mandia*** cakes, and find a substitute for vegetables in the many herbs and grasses that grow wild, and it is very few indeed who cannot fill their bellies with food which, if not appetising, is certainly satisfying. If the harvest fails or supplies run short, the cultivator finds in the ***mahajan*** a banker always ready to advance money on good security, and able and willing to tide him over hard times, provided there is no abnormal general distress; and the history of the floods and drought of 1896 shows that the agricultural community can withstand very serious calamities if the bad season is followed by a good harvest in the next year.

Indeed, the increase of population is in itself a sufficient proof that the people are habitually maintained above the level of the minimum standard of comfort compatible with the health and reproductive power of the species.

For a further investigation of this subjcet I propose first to consider the wealth of the country as a whole and the sufficiency of its food supply. Then to discuss the condition of the several classes of persons in the country; and lastly to give some account of the natural calamities to which Orissa is subject and of the possible remedies.

**The Wealth of Orissa.**

173. The wealth of Orissa may be said to consist of —

(1) Ist agricultural product. | (3) Fisheries.
(2) Ist live-stock. | (4) Manufactures.
(5) Forest and mines.

Of these the last two are but of small importance, and I will deal with them first.

**Manufactures.**

174. The most important manufacture is that of which 162,551 maunds were manufactured in 1897-98 and 195,000 maunds in 1896-97. The Coast Railway, which brings cheaper salt from Madras, threatens to ruin this industry.

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The only other article manufactured for export is the silver filligree work of Cuttack, which is highly prized everywhere, but it does not give occupation to any but a very insignificant portion of the urban population.

Brass and bell-metal utensils and ornaments, coarse cotton cloth and certain other articles manufactured for local consumption supply nearly all the wants of the people, who require very few such articles of foreign manufacture.

The artisans who manufacture these articles form in fact a component part of the village organisation, some of them still holding service lands for their work.

**Forests.**

175. There are extensive stretches of forests along the sea-board and the western boundary of the Regulation Districts, which can supply all the firewood required; but the difficulty of communication is so great that except in the big towns the people generally use dried cowdung as fuel. Large quantities of bamboos and wood are annually brought down from the western hills in the Tributary Estates for building purposes.

There are reserved and protected forests under the Forest Department in the Khurda Government Estate.

**Mines.**

176. Minerals in Orissa are the property of Government, but there are at present no mines, and it is not likely that any will be opened in the near future. (See the discussion regarding the terms of the *Kabuliyat*, Appendix A, and paragraph 262.)

Sandstone, laterite, and rubble are quarried from the hills in the western border, but only for local consumption. Coal has to be imported.

**Agriculture.**

177. The nature of the crops grown and the method of cultivation has been discussed in Chapter VI, and the question to be here considered is the sufficiency of the food-stocks and the margin available for purchases.

**Food-stocks.**

178. By far the most important article of food in the Province is rice, which, with a comparatively smaller quantity of pulse *(Dal)* and vegetables (and among the well-to-do class some fish and flesh), forms the daily meal of the Uriya.*

The first difficulty in estimating the food stocks and their sufficiency is to ascertain the outturn per acre and the area cropped; the second, to find the average consumption per head. The area we may take from the statements of cropped areas prepared in the course of the settlement proceedings,† making an addition on account of the areas excluded from settlement. For Kujang, Kanika, and Banki correct figures are to be had; in other unsurveyed estates I have assumed half the total area as under rice.

The outturn of rice I estimate at $13\frac{1}{2}$ maunds (standard weight) for irrigated, and 12 maund per ‡ for unirrigated land. From the latter figure some further deductions have to be made for losses by flood and drought. The Commissioners who enquired into the difficulties connected with the Orissa Canals estimated the average annual loss from drought at one-twelfth and that from flood at one-tenth of the total crop. These figures agree with my own conclusions, and I would accept them, applying the loss from drought to the whole unirrigated area, but that from floods to one half only, as about half the unirrigated area is safe from inundation.

The average produce of an acre of unirrigated rice land, good years and bad, is therefore $12\left(1-\frac{1}{12}-\frac{1}{2}\times\frac{1}{10}\right)$ maunds$=10\frac{2}{5}$ maunds. This is for the winter rice only. For *bialí* and *dalua* rice and the millets I take the average outturn of food-grain at about 8 maunds, and for the pulses and other *rabi* crops 5 maunds per acre.§

These figures are a little lower than those assumed by the Collector in his report on the failure of crops in 1896, when calculations were made on an average yield of 11 maunds of winter rice, $9\frac{1}{2}$ maunds of autumn rice, 10 maunds of spring

* See Appendix O.
† See Appendix F.
‡ *Vide* paragraph 137 and 109.
§ Probably it is more in most years, but I have adopted this figure in deference to the low estimates of Mr. Nathan and Mr. N. N. Banerji.

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rice, and 9 of *rabi* food-grains per acre; but if the losses in abnormally bad years are to be taken into account in striking an average, I do not think my estimate can be very far wrong.

As to consumption, the Famine Code allows 12 *chataks* of rice and 2 of *dal* for an adult male labourer, half of this for a child, and for a women 10 *chataks* of rice and 2 of *dal*.

In the Behar famine of 1874, 12 *chataks* of all food-grains for an adult, and two-thirds of this for a child was the allowance, and the Jail Code gives a figure intermediate between these two estimates.

Sir Antony MacDonnell took the average consumption of the agricultural population at three-fourth of a seer per head, and in 1874 Mr. Commissioner Ravenshaw * put the average consumption in Orissa at half a seer per day for every man, woman and child, and Mr. N. N. Banerjei gives half to three-fourths of a seer of rice as the consumption of an adult Uriya †. We may, I think, assume that the consumption for adults is not more 12 *chataks* of rice a head, and that for children 6 *chataks* a head, giving an average of 10 *chataks* a head, besides fish, vegetables and green food.

In famine time the people will live on much less‡, but in an ordinary season this is a safe average for Orissa.

The following statement shows the estimated area under the principal food-crops and the estimated outturn :—

| Crop. | District. | | Area cropped in acre. | Estimated outturn in Maunds =82·14 lbs. |
|---|---|---|---|---|
| *Biali rice* .... | Cuttack | .... .... | 135,000 | 1,080,000 |
| | Balasore | .... .... | 10,000 | 80,000 |
| | Puri | .... .... | 40,000 | 320,000 |
| *Sarad rice*.... | Cuttack. | Irrigated .... | 185,000 | .... |
| | | Unirrigated .... | 815,000 | 10,974,000 |
| | Balasore | .... .... | 850,000 | 8,840,000 |
| | Puri | .... .... | 650,000 | 6,000,000§ |
| *Dalua rice* .... | Cuttack | .... .... | 17,000 | 136,000 |
| | Balasore | .... .... | 1,000 | 8,000 |
| | Puri | .... .... | 6,000 | 48,000 |
| *Mandia* .... | Cuttack | .... .... | 30,000 | 240,000 |
| | Balasore | .... .... | Nil | |
| | Puri | .... .... | 15,000 | 120,000 |
| *Other food-grains* .... | Cuttack | .... .... | 170,000 | 850,000 |
| | Balasore | .... .... | 12,000 | 60,000 |
| | Puri | .... .... | 65,000 | 325,000 |
| Total food-grains | | .... .... | 3,001,000 | 29,081,000 |
| *Sugarcane*.... | Cuttack | .... .... | 1,000 | .... |
| | Balasore | .... .... | 500 | .... |
| | Puri | .... .... | 3,000 | .... |
| *Oilseeds* .... | Cuttack | .... .... | 8,000 | .... |
| | Balasore | .... .... | 500 | .... |
| | Puri | .... .... | 9,000 | .... |
| *Other cropped areas* .... | Cuttack | .... .... | 50,000 | .... |
| | Balasore | .... .... | 30,000 | .... |
| | Puri | .... .... | 30,000 | .... |

Surplus of food-grains.

179. Taking the population at 4,200,000 and their average consumption of food-grains at 10 *chataks* per head, the average requirements of the Province are $4,200,000 \times 365 \times \frac{10}{16 \times 40}$ or 23,703,000 maunds of rice per annum. To this we must add some 2,500,000 maunds of seed, bringing up the total to about 262 lakhs of maunds. This leaves

* Note on Col. Gulliver's memorandum printed at page 68 of Selections from Correspondence on Orissa Canals.

† Page 31 of Agriculture of District of Cuttack.

‡ Famine Commissioner's report, paragraph 86, Part III. They take 1 lb. of rice as sufficient.

§ Owing to the great inferiority of much of the Puri land, I have taken the outturn at about a maund per acre less than the other districts.

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an available surplus of 29 lakhs of maunds. This is clearly a little high, for the actual exports by sea in 1897-98 came to 26 lakhs of maunds, and it must be remembered that the estimate is for the average of a cycle of years, including those of scarcity, and that in a year of plenty like the last both production and consumption are much above the estimate. Probably in such a year 40 to 50 lakhs of maunds should be added to the normal outturn, of which 25 lakhs above the average were eaten and as much more went into reserve.

Anyhow, the figures show that in any ordinary year there must be a considerable excess of production over consumption, and that, on the average of a number of years, the outturn of food-grains after allowing for the amount required for seed leaves nearly three-fourths of a seer per head.

**Spices and Vegetables.**

180. To the plain meal of rice and pulse there are nearly always added some vegetables. Fish and vegetable curries form a favourite dish, and spices are used to season and add flavour. The vegetables most largely grown are —

| | | |
|---|---|---|
| *Baigun* or Brinjal. | Yams. | Gourds and Pumpkins. |
| Saru or Caladium. | Radishes. | Plantain. |
| Onions. | Cucumber. | |

The latter, though perhaps strictly a fruit, is more eaten as a vegetable, and with the *baigun* forms the basis of most of the vegetable curries.

None of these vegetables are exported, as they are generally inferior in quality and barely suffice for the wants of the people. Potatoes have recently been introduced and are grown with some success near Cuttack, but are not much eaten outside the town.

Spices, turmeric, chilli, coriander, mustard and ginger are used largely in cooking and the supply is not equal to the demand, so that there is a considerable import, especially of the more valuable kinds.

**Fruits.**

181. The principal fruits found in Orissa are the mango, jack, papaya, custard apple, pineapple, plantain, cocoanut, and palmyra palms. The *bael*, the cashew nut, the wild plum, and other fruits are also found, but are of less importance.

Mangoes form a very valuable addition to the food of the people in a good year such as 1897, when they certainly helped to keep the Province going until the *biali* harvest was reaped. The quality is inferior to that of the mangoes of Malda or Bombay, and the outturn very precarious.

Pineapples are grown in many villages, but are not plentiful enough to form a very valuable article of food. Plantains are grown in the gardens of many well-to-do persons, but are most used as a vegetable. The cocoanuts form a very valuable crop, of which there is a considerable export, and are eaten both while young and when fully ripe. The fruit of the palmyra tree is usually eaten young, when the kernel or *talsaj* is considered a great delicacy. When mature, however, it forms a useful article of food boiled with a little rice flour, and numbers of persons are said to have lived on it in the famine of 1866. Except of cocoanuts, there is no balance of any fruit available for export.

**Herbs and roots.**

182. Spinach (*Sag*) is a very common article of food in Orissa, and a portion of the homestead called *saghari* is invariably set apart for growing it. A little *sag* fried in oil often takes the place of *dal* and curry. The following varieties are ordinarily grown in *baris*—

(*1*) *Neutia.*
*(2) Kosala.*
*(3) Bathua.*
*(4) Khara.*
*(5) Piranga.*
*(6) Poi.*



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The following varieties which grow wild are also largely consumed—

*(1) Puruni.*
*(2) Paunsapansia.*
*(3) Kanseri.*
*(4) Moti.*
*(5) Kanta neutia.*
*(6) Suni suniu.*
*(7) Kalama.*
*(8) Gaicha*
*(9) Pitagahama.*
*(10) Madaranga.*

***Puruni, madaranga, moti,*** and ***kalama*** (water herb) are in times of severe scarcity boiled and eaten with a little salt. ***Puruni*** and ***kalama*** are very rare, but the country contains a sufficient supply of ***madaranga*** and ***moti*** to keep alive about 2 per cent. or 40,000 persons for about eight months from ***Kartick*** to ***Jaishta.*** But these herbs should not be regarded as a food reserve for human beings, as on failure of straw they must take its place as fodder for cattle.

The following roots are eaten ordinarily by the low caste people and in times of scarcity by more respectable people—

*(1) Bano Ola.*
*(2) Tunga Alu.*
*(3) Sankhu Alu.*
*(4) Koraba*
*(5) Pitamasia.*
*(6) Surkuti.*
*(7) Koi Munda.*
*(8) Mar Murua.*
*(9) Bhuin Kakharu.*

These are available almost throughout the country.

Fisheries.

183. Fish abound in the tanks and rivers, and are eaten by all classes and castes. The chief supply is derived from the Chilka Lake and the larger rivers, in which numbers of fish are caught and either eaten fresh or preserved by drying in the sun. This dried fish, or *sukwa,* is highly odoriferous, and not likely to be appreciated by foreigners until some better mode of curing is adopted; but it is much eaten by boatmen, carters, *et hoc genus omne.*

In the rains fish get into the rice-fields and are caught by the boys as the waters subside, and form a welcome addition to the family meal of those who cannot afford to buy such luxuries.

It is very difficult to estimate the value of the fish eaten, but the minimum consumption per house must be a rupee's worth a year, which would give the value at 10 lakhs.

Live Stock.

184. After food-grains; cattle form the principal wealth of the people. Large herds are grazed during the hot weather on the ***palanda*** lands of Kujang and Kanika and the other estates near the coast, and in the rains are driven off to the jungles of Khurda and other high tracts; their flesh is but rarely eaten even by Mahomedans, but milk and ghi are consumed in the country by well-to-do persons.

Unfortunately, there are no complete statistics of the number of cattle in the Province or of the number exported for sale, but a considerable number are known to be sold every year.

Sheep and goats are met with everywhere in considerable numbers. The goats are kept both for their milk and their flesh, which is eaten by Hindus except by Brahmins and Baishanabs; a good many are also exported for sale.

From Survey returns for eleven Parganas in Cuttack, I find that in an area of 243 square miles containing 45,800 houses there were 46,400 bullocks, 46,300 cows, 700 buffaloes, 3,200 goats, 3,600 sheep, besides small numbers of other domestic animals. There are in this area 18,200 ploughs. We may take it then that there are nearly 200 plough cattle, and rather more of other cattle to the square mile: say for the Province 1,000,000 plough cattle, and as many cows

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besides 200,000 sheep, goats, and pigs. Their value is difficult to estimate : at half a seer of milk a day a cow's yield should be worth Rs. 6 per annum; the value of the calves may be set off against the cost of feeding. Sheep and goats must bring a profit of at least Rs. 2 each per annum.

Total wealth of available.

185. I thing it has been made clear that the Province produces much more than is sufficient to feed it, and we are in a position to make an estimate of its wealth, excluding interest on capital and value of labour.

| | Rs. |
|---|---|
| Value of food—grains less amount for seed at Rs. 2—4 per maund. ... ... | 6,50,00,000 |
| Oilseeds and other agricultural produce ... ... | 50,00,000 |
| Live stock and dairy produce (excluding value of purely agricultural cattle) ... ... ... | 60,00,000 |
| Salt ... ... ... ... ... | 4,00,000 |
| Fish ... ... ... ... ... | 10,00,000 |
| Manufactures, etc. ... ... ... ... | 10,00,000 |
| Total ... | 8,74,00,000 |

or Rs. 22 per head of the population.

Now out of this we must first deduct the amount consumed as food or used for clothing, etc., and the balance must suffice to pay the taxes and the price of all articles imported from abroad, besides leaving a surplus for remittances to absentee proprietors. We must assume that this balance is all exported.

The taxation of Orissa is roughly as follows :—

| | Rs. |
|---|---|
| Land Revenue .... .... | 24,00,000 |
| Excise .... .... | 6,60,000 |
| Stamps .... .... | 5,00,005 |
| Registration .... .... | 40,000 |
| Road Cess .... .... | 1,35,000 |
| Public Works Cess .... .... | 1,35,00 |
| Municipal taxes .... .... | 1,15,000 |
| Income tax .... .... | 60,000 |
| Water Rate .... .... | 3,15,000 |
| Dak Cess .... .... | 20,000 |
| Total .... | 43,80,000 |

Imports by sea in 1897-98 were valued at 82½ lakhs, but this includes railway material which being deducted leaves 78 lakhs as against 67 lakhs in the previous year. To this we must add imports by road, river, rail and canal, and I think we may take the total imports of the Division at 80 lakhs of rupees.

The remittances to absentee landlords who spend their money in Calcutta cannot be placed at less than 2 lakhs. The value of the exports by sea in 1897-98 were returned at 96½ lakhs and we may safely add another 3½ lakhs for grain, cattle, and other produce exported by rail or road. The total exports will then stand at 100 lakhs, of which 80 lakhs are for food-grain, 5 lakhs for hides, and the rest made up of various articles of minor importance.

There is thus a large apparent surplus of expenditure over income, which may in part be accounted for by the remittances of emigrants.

The census table show that there are about 72,000 Uriyas living out of Orissa, and most of these are in service earning good pay and remitting money by money-order or *hundis*. Taking their savings at Rs. 40 per head, the total amount would be nearly 28 lakhs, and I think the remittances may be put down as 20 lakhs. The postal returns show 27 lakhs of money-orders received and most of this is from other districts, so that the above estimate is not excessive.

Even so, the accounts will not balance; but the reason is that the equation is by no means so simple as it appears. A great deal of the money collected as taxes finds its way back into the pockets of the people as wages of employees and labourers, so that no accurate adjustment can be expected, but I believe that these estimates, rough as they are, give a fair idea of the income and expenditure of the Province as a whole.

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186. The estimate given in paragraph 170 shows that very nearly 60 per cent.* of the population is engaged in agriculture, and I propose first to deal with their condition.

**Size of agricultural holdings.**

The number of holdings, as recorded in the Settlement paper, is as following :—

| District. | Number. | Area in acres. | Average area of a holding. |
|---|---|---|---|
| Cuttack .... | 650,600 | 822,500 | 1·26 |
| Puri .... | 204,400 | 373,300 | 1·82 |
| Balasore .... | 376,600 | 692,600 | 1·80 |
| Total .... | 1,231,600 | 1,888,400 | 1·53 |

Sometimes, however, it occurs that one man holds land in more that one village, and enquiries made in 26 agricultural villages† show that out of 100 heads of families, 56 hold over 2 acres each, 30 hold 2 acres or less, and 14 have only homesteads.

The last are, for the most part, labourers; the 30 are artisans, weavers, and others who combine agriculture with their proper pursuits. It is all a question of degree, but the figures bear out the estimate above given that about 60 per cent. depend chiefly on agriculture.

The average holding of the agriculturist works out to 3·23 acres, and of the whole population to 2·21 acres per head of a family.

These villages were selected with care, and much trouble was taken in compiling the figures, but I fear they are still below the mark. ‡

Taking the number of persons in each family at five and the cultivated area of the Province at 4,930 square miles (viz., Cuttack 2,200, Balasore 1,460, Puri 1,270), the average area of cultivated land per family is a little over $3\frac{4}{5}$ acres per family, which would give about 5 acres to the agriculturists.

**Profits of cultivation.**

187. Let us, however, see what is the condition of the Uriya, supposing him to hold 3 acres of rice land and quarter of an acre of homestead. Taking the land to be unirrigated and all to grow *sarad* rice, the outturn would be, according to my estimate 57·2 maunds of paddy, besides straw about 75 maunds. Setting aside 3 maunds of paddy for seed, the cultivator will get 33 maunds 35 seers of clean rice.

His family will consist of himself, his wife, one grown up and two small children, requiring altogether four adults' rations or 40 *chataks* of rice a day. They will, therefore, eat in the year at least $22\frac{1}{4}$ maunds, leaving only 11 maunds 5 seers for all expenditure. He will, in his own compound, grow all the vegetables he uses, and with the straw and chaff can keep a pair of bullocks. He can do all his own ploughing, but will require some help, for which, and his other expenses, the following estimate has been made by Babu J. M. Das, an officer intimately acquainted with Uriya peasant life§.

| | Rs. | A. |
|---|---|---|
| 1. For weeding, 30 labourers besides himself, at one anna six pies each. | 2 | 13 |
| 2. For reaping, binding, and carrying to the threshing floor, 24 paid labourers at two annas each besides himself and *badla* labourers or labourers working in exchange for his own labour. .... | 3 | 0 |
| 3. Rent .... .... .... .... .... | 10 | 2 |
| 4. Carpenters and blacksmiths for repairing agricultural implements (18 seers of rice) .... .... .... .... | 1 | 2 |
| 5. Chaukidar (8 seers of rice at 2 *gaunis* of paddy per acre) .... | 0 | 8 |
| 6. Washerman and barber .... .... .... | 1 | 0 |
| 7. Salt and oil .... .... .... .... | 5 | 0 |
| 8. Spices, betelnut, tobacco, etc. .... .... .... | 2 | 0 |
| 9. Fish *dal* (pulses) and other petty expenses. .... .... | 3 | 0 |
| 10. Cloth .... .... .... | 7 | 0 |
| Total ... | 35 | 9 |

* 57 per cent. was the recent estimate of the Secretary of State for the whole of India.

† Five groups in five Thanas of Cuttack,

‡ Similar figures compiled in Balasore gave an average of $3\frac{3}{8}$ acres per tenant.

§ Mr. Nathan in his note on Kotdesh puts the cost per acre at from Rs. 7 to Rs. 9, including, however, the value of the man's own labour and that of his cattle. Mr. N. N, Banerjei puts the cost at Rs. 9-9 for broadcast and Rs. 10 for transplanted rice (excluding rent and seed ).

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The value of the rice left over after feeding the family is only Rs. 24-6, so there is a deficit of Rs. 11-3, equal to another 5 maunds of rice. If the land were wholly irrigated, there would be an additional margin of 4½ maunds, so that the expenses and receipts would nearly balance, and we may, I think, take it that quarter of an acre of homestead with 3 acres of irrigated, or 3½ of unirrigated land would just support the ordinary agricultural family of five on a subsistence allowance of food. *.

Expenses such as marriages and a bad season would have to be met from other sources such as the son's earnings as a labourer, and in a bad season the raiyat would inevitably become indebted to the ***mahajan,*** and would in all probability never again be clear of debt.

**Mr. Kingsford's estimates.**

188. In his report on Balasore, † Mr. Kingsford has arrived at some-what different conclusions to those given in the preceding paragraphs. Starting with an estimated outturn of 14 maunds ‡ of paddy to the acre, he finds that after paying their rents, the cultivating classes have left 8,198,300 maunds which, divided over 143,535 families, gives an average to each of 57 maunds, the whole of which will be required for food, according to the following estimate §.

"If the family consists of three adults and two children, one of whom is an infant, the following will be the details of their consumption of rice annually :—

"(1) Rice for four persons at 10 ***chataks*** per head daily amounts to 2½ seers per day, 75 seers per month, and 22½ maunds per annum.

"(2) The infant will consume cakes of rice flour to the amount of 2 seers a month and 24 seers per annum.

"(3) ***Arua,*** or rice husked and unboiled, will be required for festivals at 5 seers per month, or 60 seers per annum.

"(4) ***Khai,*** fried rice, sometimes seasoned with sugar. The monthly consumption will be 2 seers and the annual 24.

"(5) Rice for making gifts, also 24 seers annually.

"The total annual consumption of rice is, therefore, 25 maunds and 32 seers, which, at the conversion of 22 of paddy to 10 of rice, amounts to 57 maunds. As the paddy is husked by the women of the family, the yield of rice is likely, in fact, to be somewhat greater, and may leave a balance of a few maunds, of which two will be disposed of as the perquisites of the village washerman, barber, carpenter, blacksmith, and chaukidar."

The total expenses of the family Mr. Kingsford estimates as follows :— ¶

"For a family of five, three adults and two children, in ordinary circumstances, the annual expenditure of which particulars have not already been given, may be thus stated :—

| | | Rs. | A. | P. |
|---|---|---|---|---|
| "(a) Living— | | | | |
| Paddy to be husked by the women of the family, 57 maunds | | Nil. | | |
| ***Dal*** from his own ***bari,*** or obtained in exchange for some of the rice which would otherwsise be consumed .... | | Nil. | | |
| Condiments, etc., at Rs. 2-2 per month. | .... | 25 | 8 | 0 |
| "(b) Thatching — | | | | |
| Straw from his own field | .... | Nil. | | |
| Labour, his own | .... | Nil. | | |
| Bamboos and twine | .... | 0 | 10 | 0 |
| "(c) Clothing. | .... | 9 | 1 | 0 |
| "(d) Miscellaneous | .... | 1 | 14 | 9 |
| Barber, Washerman and Chaukidar — One maund of paddy | | Nil. | | |
| "(e) Comforts and luxury— | | | | |
| Ornaments, average for the year | .... | 1 | 5 | 0 |
| Utensils | .... | 0 | 8 | 0 |
| Stimulants | .... | 2 | 8 | 0 |
| Total | .... | 41 | 6 | 0 |

* See Mr. N. N. Banerjee's report, page 37. He makes out that even with 10 ***mans*** of land a raiyat has to meet an annual deficit of Rs. 17, but this cannot be correct with 10 ***mans*** a man is well off.
† Report on Settlement of Balasore, Part V.
‡ That is, on the whole cultivated areas.
§ Balasore report, paragraph 193.
¶ Balasore report, paragraph 200.



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| | | Rs. | A. | P. |
|---|---|---|---|---|
| "(f) Agricultural— | | | | |
| Rent, already deducted from the produce | .... | Nil. | | |
| *Abwabs* | .... | 2 | 8 | 0 |
| Seed grain, 32 seers per acre | .... | 2 | 12 | 0 |
| Manure, not purchased | .... | Nil. | | |
| Labour, his own or that which others supply him in return for his own | | Nil. | | |
| Total | .... | 46 | 10 | 0 |
| Repairs of implements—1 maund of paddy to the Carpenter and Smith. | | Nil. | | |
| Total | .... | 46 | 10 | 0 |

The deficit of Rs. 46-10 Mr. Kingsford proposes to meet by assuming one of the children to earn two annas a day by labour or Rs. 34 per annum, and other members of the family a few rupees by odd jobs, which, with sale of garden produce, may make up an income of Rs. 40 to Rs. 50.

I doubt whether the equation is correctly worked out, but the estimate may be taken as a very fair picture of the expenses of a family depending partly on agriculture, say three acres, and having some additional means of sustenance such as remittances by a grown-up son gone into service, or a profession such as that of a potter.

The large item for condiments and spices must, however, be reduced by the produce of the homestead; the payments to village servants are rather too large for a small holding, and in Cuttack the large payments for "*abwabs*" and stimulants could be considerably reduced.

The most interesting point of the estimate is that no allowance is made for expenses of cultivation, the whole being put down as the labour of the family, while in most estimates we find large payments for labour. As the number o labourers is less than a quarter that of the cultivators, and many of the former are tillers of zamindar's *nijchas* or employed by Brahmans and Karans, it is clear that the small cultivator cannot employ much outside labour, and for such as he does he pays in the form of his own labour.

The conclusion I come to is that if he has less than 3 acres of average land, a man must earn something by labour or by cultivating a few *gunths** of sugarcane or other valuable crop.

With 3 to 4 acres of land a man can live and support a family in an ordinary year, but with no margin for luxuries or comforts; with 5 acres or more he is fairly well off.

In the Government estate of Khurda I found 4 acres to be the average area of the cultivator's *jote* (see paragraph 50 of my covering report).

**Indebtedness of raiyats,**

189. If we except well-to-do raiyats holding themselves 8 or 10 acres or more of land, there are very few cultivators not in debt to the *mahajan*. Enquiries made by the Assistant Settlement Officers have not resulted in much definite information, but it appears to be well established that the petty cultivator pays away as rent and interest the whole of his crop, except what is left to him for subsistence allowance, and has almost always to borrow again before the next harvest is ripe. In a good year he will pay his debts and rent in full in January or February and have enough to carry him on throughout the year if he has no unusual charges to meet, but he will probably seize the opportunity to marry off a son or daughter which may leave him indebt to the extent of Rs. 50 for which he will probably execute a mortgage on his land or a portion of it.

In bad years payment of rent and loans will not leave the cultivator enough to eat, and he will probably borrow again in June or July enough to carry him on to the end of the year. Most of the money, or rather grain, lending in Orissa is in the hands of zamindars or proprietary tenure holders, and they are by no means hard creditors. Very occasionally a bad tenant gets sold up, but as a rule the zamindar knows that it is to his interest to keep his raiyat going, and will supply him on the usual terms with the necessary grain, even though there be

* 25 *gunts* = 1 *man*, see paragraph 124.

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a large accumulated debt. As security he nearly always requires a bond (*tamsuk*) pledging the land, but these are not often used, and sometimes even particulars of the land and of the consideration are not filled in.

The only matter in which I have known raiyats to show any providence is that of preserving grain for seed, and several instances were brought to my notice in 1897 where the cultivator, though reduced to great straits for food, getting practically no rice to eat, refused to touch his little seed-store.

Grain loans.

190. Agricultural loans * are most commonly made in the form of grain or of cash to be repaid in grain.

Sometimes raiyats lend grain to one another, but more often they apply to their *mahajan*, who is as a rule their zamindar. The commonest of all loans is one of grain for food and seed advanced in May and June or July or later, and repayable in kind in the following December. These loans are generally known as *sawai*, implying that one-fourth more than the amount lent is to be repaid, or as *panchpai*, which has the same meaning. Often, however, a yet higher interest is taken by *mahajans*; half as much again as was borrowed (*derdhi*), or even twice as much (*dwigun*) have to be repaid at harvest time.

Cash loans.

191. The raiyat requires very often to borrow money in order to meet the *kist* of rent due in November before the winter rice is ripe. This he must obtain from a *mahajan* on the "*Karhia*" system, *i. e.*, he will in February repay the loan in grain at the market rate then current, with two *gaunis* ( about 8 seers or 20 per cent. ) as interest. Opinions differ very much as to the extent to which such borrowing is resorted. Mr. Nathan, whose intimate acquaintance with the Kotdes estate is unrivalled, reported † that in Puri the raiyat does not pay his rent through the agency of the *mahajan*, while Babu Jamini Mohan Das in Jajpur stated that the great majority of raiyats have to borrow for paying the *kist* that falls due in November.

I take it that much depends on the season and much also on the punctuality with which the zamindar realises his rents; some allowance also must be made for the nature of the country, and in Puri and south Cuttack a comparatively larger area is under *biali* rice and *mandia* than in northern Cuttack and Balasore.

Ordinary money loans (*karja*) are made at monthly interest of half an anna per rupee per month. Sometimes an anna per rupee is charged or even more, and if the sum be large and the security good, the rates may be as low as 12 per cent per annum.

If the sum is not very petty, repayment is secured by a bond with or without a surety. Loans on simple mortgage (*rahan bandhak*) usually bear interest at 6 pies per rupee per month. In the case of a usufructuary mortgage (*dakhal bandhak*) no interest is charged, but the *mahajan* obtains possession until such time as the debt is repaid.

Conclusions as to position of agricultural population.

192. In spite of their indebtedness, and of the liability of the crops to injury by extremes of drought and flood, it is still the case as it was thirty years ago that in times of real scarcity the agricultural classes have more resources than any other, and I can quote as true of Orissa at this day the words of the Commissioners who visited the Province in 1867 ‡ :—

"Still more remarkable than in the North-Western Provinces ( as noticed in such striking terms by Colonel Smith) was the advantage possessed by all the classes having any sort of rights in the land. In this instance, not only they had better means and better credit than the labouring classes, but being to a considerable extent in the habit of keeping grain for home consumption, those who had crops of some kind were better provided than the nonagricultural classes when grain was not to be bought."

Indeed, land is yet more valuable now than it was then, owing to the greater freedom of transfer. A revenue free property fetches Rs. 100 to Rs. 150 an acre, and tenant-right with fixity of rent Rs. 40 to Rs. 80 per acre.

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* See N. N. Banerjei's Agriculture of the district of Cuttack, Page 38.

† Mr. Nathan to Settlement Officer, No. 238, dated 24th February. 1893.

‡ Report on Famine of 1866, Paragraph 77.

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Condition * of non-agricultural classes or classes who depend for their subsistence either wholly or chiefly on means other than agriculture.

193. These may be divided into—

(1) Artisan or skilled labourers.
(2) Unskilled labourers.
(3) Others.

The wages given to classes (1) and (2) by the Public Works Department during the thirty years 1869-99 may be taken as fairly representative of the prices of such labour. A carpenter or a blacksmith now gets from 7 to 8 annas per diem, an ordinary male day-labourer gets from 2¾ to 3 annas, a women gets 2 annas, and a boy gets from 1¾ to 2 annas per diem. In the last few years there has been a decided rise in the earnings of these classes owing to the great demand for labour on the Bengal-Nagpur Railway. These are wages which a labourer can get away from his home. In his own native village a skilled labourer gets from 4 to 6 annas and an adult unskilled labourer from 1½ to 2 annas per diem according to the demand for labour. For making and repairing agricultural implements carpenters and blacksmiths are always paid in kind, the annual payment averaging about 9 seers of rice from each client. When paid in kind, the day labourer gets varying quantities of paddy equivalent to 2 to 2½ seers of rice. There are two other classes of unskilled labourers—(1) the ***kuthia*** or ***halia*** who is engaged by the year and paid daily in kind and (2) the ***chakria***, who is also engaged by the year but paid in cash. The following table shows the wages ordinarily given to these two classes of labourers:—

| Name of Subdivision. | *Kuthia* or *Halia* | | | | | | *Chakria.* | |
|---|---|---|---|---|---|---|---|---|
| | Rice given daily (paddy converted into rice.) | | Loans without interest. | Cloth. | | Other allowances, if any. | Annual cash wages with food. | Cloth. |
| | Quantity. | Value. | | Number and description. | Value. | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | S. CH. | A. P. | Rs. | Gamcha | As. | | Rs. | Rs. A |
| 1. Cuttack | 1 12 | 1 8 | 3 to 5 | ... | ... | ·50 acre of land as *jagir* and 65 seers of paddy at the end of the year besides the daily wages. | 12 to 15 | 2 Pieces of dhoti 1 8<br>1 *gamcha* 0 6<br>1 Winter cloth 1 0<br>Total ... 1 14 |
| 2. Jajpur | 1 5 to 1 10 | 1 3 to 1 7 | Re. 1 and 40 seers of paddy | 1 | 5 | ·50 of an acre of land as *jagir* and 40 seers of paddy at the end of the year besides daily wages. | 12 to 18 | 2 pieces of cloth 1 4<br>2 *gamchas* 0 7<br>1 Winter Sheet 0 14<br>Total ... 2 9 |
| 3. Kendra para | 2 0 | 1 10 | 3 to 5 | ... | ... | ·40 of an acre of land as *jagir*. | 9 to 18 | 2 Pieces of Cloth 1 6<br>2 *gamchas* 0 10<br>1 Winter Cloth 1 0<br>Total ... 3 0 |
| 4. Puri | 2 0 | 1 10 | 15 to 20 | ... | ... | ·50 of an acre as *jagir* land. | 18 to 24 | 2 Pieces of Cloth 1 8<br>2 *gamchas* 0 12<br>1 Winter Cloth 1 4 0<br>Total ... 3 4 |
| 5. Khurda | 2 0 | 1 10 | 15 to 20 | ... | ... | | | |
| 6. Balasore | 1 10 | 1 7 | 5 to 10 | 1 | 5 | ·50 acres of land as *jagir*. | 18 to 24 | Ditto |
| 7. Bhadrak | 1 10 | 1 7 | 5 to 10 | 1 | 5 | Ditto | 12 to 18 | 2 pieces of Cloth 1 4<br>2 *gamchas* 0 7<br>1 Winter sheet 0 14<br>Total... 2 9 |

* This is taken from a note by Babu Jamini Mohan Das, Deputy Collector and Assistant Settlement Officer.

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An artisan with a family of five earning seven annas a day does not spend more than five annas a day, and he is thus able to lay by somthing which enables him in time to invest his savings in land, the great ambition of every man in Orissa. There is hardly any really skilled artisan who has not, if he is a man of the mufasal, some land and if a man of the town, some money-lending. I do not here include the village artisans who, never going out of the village, form part of the village organisation and are indirectly supported by agriculture. The most helpless class among the artisans are the weavers, who, living from hand to mouth with a scanty income, and having little or no connection with cultivation, seriously, suffer in famine.

The lot of the day-labourers is rather hard in Orissa, as it is in amny other parts of India. Spending what he earns from day to day, he has very little to pawn or sell in times of distress, and is therefore the first to succumb, unless constantly watched and provided with work within his easy reach. No labourer cares to go to a distant work leaving his family uncared for with the prospect of only earning enough for himself. Unlike the Behari, the Uriya never moves with his family, and this peculiar characteristic of the Uriya people should be never forgotton.

The *kuthia* or *halia* is a little better off than the day-labourer in that he has a better man to look after him, who, if an old master, does not forsake him until he is himself reduced to the very last strait. In paragraph 23, Part III, of their Report, the Famine Commissioners wrote :—

"Sir H. Strachey puts it thus in the evidence from which we have already quoted: 'During a great famine dependence, slavery and captivity are for the poor highly available' and without going quite so far, we may say that the evolution of a body of some in some sense independent labourers for wages, increases the difficulty of abnormal seasons. We doubt if English labourers could as well resist a season in which food should be two or three times its ordinary price as do the people of India."

The third class comprises beggars and men employed in services and professions of all kinds. Orissa is noted for its *quasi*-public charities; charitable endowments covering immense areas are scattered all over the Province, but unstinted private charity as it exists in Bengal is unknwon here.

The beggars ordinarily met with belong to three castes—(1) Brahman, (2) *Jogi* and (3) *Kela*. There number is very small, probably about ½ per cent. the total population.

Most of the professional men, combining agriculture with their professional incomes, are fairly prosperous.

Roughly, the proportions of the various classes who live wholly or chiefly by means other than agriculture may be put down as follows :—

| | Per cent. |
|---|---|
| 1. Beggar .... .... .... | 5· |
| 2. *Kuthias* or *halias* .... .... | 2·5 |
| 3. *Mulias* .... .... .... | 5· |
| 4. Artisans, servants, and professionals .... | 36· |
| Total .... | 44* |

**Rise of wages and prices.**

194. In page 171, volume II, of his History of Orissa, Sir W. W. Hunter lays dawn this proposition : "All wages that are paid in money have risen by more than one-third ( during twenty years ); all wages that are paid in kind remain the same."

Measured by the quantity of grain which is given, it is quite true to say that there has been no increase in wages in kind during the last twenty years; nay, during the last forty years : but a little calcuation will show that their money valuation has increased by 90 per cent. during the last thirty years.

It is mentioned on page 93 of Mr. Toynbee's History of Orissa that in 1814 a day labourer could earn two annas per diem in town when he can now earn three annas per diem, being an increase of 50 per cent. Supposing there has been

* This leaves a residue of 56 per cent. of the population dependant upon agriculture. In a previous paragraph the estimate was 60 per cent. The difference is due to the fact that some of the agricultural castes depend in a considerable measnre on service for their support.



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no increase in the rate of wages in kind, the following table compares the rise in the value of the two kinds of wages :—

| YEAR. | Money wages. A. P. | WAGES IN KIND. Quantity of rice. SRS. | WAGES IN KIND. Money value. A. P. | PERCENTAGE OF INCREASE. Money wages. | PERCENTAGE OF INCREASE. Wages in kind. |
|---|---|---|---|---|---|
| 1814 .... | 2 0 | 2 to 2½ | 0 10 to 1 0 | .... | .... |
| 1889 .... | 3 0 | 2 to 2½ | 1 10 to 2 3 | 50 | 125 |

**Note—The money wages given in this table are town wages. In villages the wages have risen in the same proportion, and are now slightly less in value than wages in kind.**

As money wages have not risen in the same proportion as the prices of the staple food-crops, the condition of town labourers has deteriorated, while that of the village labourer who receives his wages in kind has distinctly improved.

Wages in money are now slightly less in value than wages in kind, and the latter are therefore always preferred by the village labourers. In a conservative country like Oaissa custom takes a long time to change, and money wages may, therefore, lag behind wages in kind for some time to come.

It is extremely difficult to get a coolie in the mufasal for cash wages in the sowing and reaping seasons, when wages in kind are freely given.

The rise in prices has also directly benefited the cultivating raiyats who pay their rents in cash. The diagram facing paragraph 164 shows the fluctuations in prices of common rice from the date of the last Settlement to the present time.

It appears that a severe flood in 1836 and a severe drought in 1840 caused prices to rise very high in 1837 and 1840. Omitting these two exceptional years, the average of eight out of ten years following the last settlement comes to 48·14 against 18·23 during the ten years 1887-96 before expiry of the settlement, giving an increase of 163 per cent. : very nearly the same results are obtained, if instead of ten years averages are taken for fifteen years, including the high prices during both the periods.

Competitive or *pahi* rents have, during the same period, risen by 44 per cent., or 119 per cent. less than the rise in prices which, after a deduction of one-third on account of increase in the cost of cultivation, still leaves a difference of 64 per cent. in favour of the cultivator.

**Famines.**

195. So far the condition of Orissa in an average year only has been considered, but the most difficult problem that the administration has to face is the liability of the Province to loss of crops from natural calamities.

The rainfall in Orissa is in most years ample for its needs, the average being 62 inches per annuam; * but it is precarious, and its early cessation is fatal to the rice crop. On the other hand, the channels of the numerous rivers are insufficient to carry off the great volume of water that comes down after heavy rain from the table lands of Chota-Nagpur and the Central Provinces, and the waters overflow the banks and inundate the whole country, causing mere or less injury to the standing crop. Less frequent but even more serious damage has been done by storm waves on the sea face, and though the low lands are to some extent embanked against the salt water, violent cyclones have breached the embankments and caused great loss to life and property.

It is sometimes said that the effect of these natural calamities has been aggravated by the attempts made to restrict the rivers within their channels by means of embankments, but a retrospect of the early history of the Province will, I think, show this view to be erroneous.

Historical records † show that great famines occurred in the fourteenth, fifteenth, snd sixteenth centuries of our era, in the reigns of Raja Kahil Indra Deo, Raja Rai Uriya, and Raja Pestub Madra Deo. The great Bengal Famine of 1770

* See Paragraph 107.
† Paragraph 51 of Report of Commissioners on the famine of 1866.

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was grievously felt in Orissa, and a few years later in 1774-75 another serious scarcity is said to have occurred. Again in the *Amli* year 1200 corresponding to 1792-93 A. D., in the time of the Mahrattas, the last great famine of the 18th century devastated the Province.

In the famine of 1769-70 Stirling says that "rice was not to be had for two seers per rupee. In 1183 (1775 A. D.) rice was hardly to be purchased in the bazar of Cuttack at ten *pans* the *Katki* seer," or 10 annas for a seer of 105 tolas. He adds that a remission of 7 lakhs of revenue was given in that year. In Mr. Toynbee's history we find that during 1803 and 1804 there was scarcity in Cuttack but not in Balasore. In 1806 there was "total failure of the rains between 17th September and 18th November."

In July 1807 there were heavy floods followed by scarcity, and 1809, 1817 and 1828 were years of bad crops and great distress.

The most serious calamity of the first half of the century was the inundation of the sea on the Balasore coast in the years 1831-32. By this a larg tract of country was temporarily thrown out of cultivation and almost depopulated, and the whole agricultural system of the district greatly disorganised. In 1834-35 the country was laid waste by inundation and in 1836,1837 and in 1842 Orissa suffered severely from drought; but the only general famine of this century comparable with that of 1770 is that of 1865-66.

Like all the greatest famines of Indian history it was due to drought, though the effect of this was aggravated by that of floods in August in the following year. More than half of the rice crop was lost, and prices rose to 5 seers to the rupee in June, 1866, and were much higher in some tracts on the Dhamra. The mortality was estimated by the Lieutenant-Governor at one-fifth, and by the Famine Commissioners at one-fourth of the whole population; and even if these estimates be somewhat high (see also paragraph 198), they are near enough to show what frightful suffering such a failure of the harvest entailed. In 1877-78 there was a famine in the neighbouring province of Madras and a partial failure of the rains in Orissa in the same year, with the result that prices rose rapidly and there was a good deal of local distress but nothing of the nature of real famine.

Again there was failure of the October rain of 1888 and 1891, followed in the latter year by heavy floods which caused a considerable loss of crops, and there being at the sametime scarcity in parts of Bengal and Behar prices rose to above 14 seers.

In 1896 there occurred in all the principal rivers a flood of great height and unprecedented duration followed by short rain in September and an almost complete failure in October. Similar causes led to scarcity and famine throughout India, and at one time there was some fear lest we might find ourselves in Orissa face to face with such an insufficiency of food stocks as there had been in 1866.

The outturn of rice was estimated at 7 to 8 annas of a normal crop and the deficit to be supplied by import was put at 10 lakhs of maunds in Cuttack alone, allowing for the stocks in hand and the outturn of *rabi* crops *. In the event, however, though there was considerable local distress, very little relief was found necessary in Balasore beyond such as was afforded by the facilities for obtaining earthwork on the railway; in Cuttack the grants by the District Board were supplemented by contributions from the Indian Famine Relief fund. In Puri in the neighbourhood of the Chilka Lake distress was more serious, but on the whole the people proved capable of supporting themselves.

**Increased resources of the country.**

196. The difference between the two years 1865-66 and 1996-97 is very striking, and seems to show a great improvement in the resources and communications of the country. The years preceding the famine of 1866 had been a most prosperous era, distinguished by a great development of the exports, * and the terrible distress that followed the drought of 1865 seemed to disprove the truth of the popular belief that the food stocks left after a good year are sufficient to meet the wants cuased by a single harvest's failure †. The years 1890-95 were marked by failure

* Commissioner to Government, No. 5R. of 5th January 1897.

† Report of Commissioners of Orissa famines, paragraph 8, Part II. There was however a poor crop in 1864-65, especially in Puri.

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of rain and floods in 1891-92 and heavy exports in subsequent years which might have been expected to deplete the stocks in reserve, yet not only did the Province escape famine but it exported some 30 lakhs of maunds of grain in 1896-97 and 26 lakhs in 1897-98. The following * statement compares in a tabular form the two years :—

| Year | Rainfall. | | | Estimated outturn of harvest. | Average price of clean rice. | Highest price of clean rice. |
|---|---|---|---|---|---|---|
| | September. | October. | Total for the year. | | | Seers. |
| 1865-66 .... | 5·20 | Nil | 36·30 | ⅓ | 9·36 | 3 |
| 1896-97 .... | 6·33 | ·31 | 53·13 | ½ | 11·87 | 9 |

In 1863-64 the exports from Orissa mounted to 5¼ lakhs of maunds; in 1864-65 to 9⅛ lakhs. In 1865-66 they fell to 62,000 maunds, and in the following year were practically nil, while from May to November 1866, 2¼ lakhs of maunds were imported. On the other hand, in 1896-97 exports reached their highest limit of 30 lakhs of maunds, and in the following year again there were large exports.

**Food Reserves.**

197. It is difficult to account for this great difference. An interesting estimate was prepared by the Collector of Cuttack of the produce and food-stocks of the district for the years 1890-96 †. He assumed the average produce at 120 lakhs of maunds of rice, which is a fairly high estimate - see paragraph 178 above - and that of other grains at 8¼ lakhs of maunds, *plus* 1¼ lakhs imported. The annual requirements are taken at 124 lakhs of maunds for food, *plus* 16 lakhs of maunds for grain; total 140 lakhs of maunds, or, deducting other grains, 138 lakhs of maunds of rice.

The exports averaged 11 lakhs of maunds, making an average annual deficit of 22 lakhs of maunds, for six of which the Collector accounts by imports from the Tributary Mahals, Balasore, and Khurda.

After examing the liability to error, the Collector found the stocks available for sale or export to be 10¼ lakhs of maunds and the outturn of the year, 68¼ lakhs of maunds, making a total of 79 lakhs of maunds, against requirements of 131 lakhs.

It is obvious that this was not the actual state of affairs, and I do not think the outturn of winter and autumn rice can have been underestimated. The *rabi* crop was, however, exceptionally good, and we may add on this account another 15 lakhs of maunds instead of 8¼ mentioned by the Collector, and perhaps 5 lakhs of maunds for *dalua* (spring rice), raising supplies to 100 lakhs of maunds. Taking the consumption at 100 lakhs of maunds for food, or under half a seer a head per diem, and adding 10 lakhs of maunds for seed, we get a minimum deficit of 10 lakhs.

The exports were certainly greater than imports from the Tributary Mahals or elsewhere, and the stocks cannot have been less than of 20 lakhs of maunds at the lowest figure.

I think the error lay in underrating the stores of grain held by large raiyats and petty *lakhirajdars*. It is certainly a fact that the grain trade is in the hands of the big dealers who have agents all over the country, but officers of experience, such as Mr. Nathan, have denied that the well-to-do raiyats hypothecate their produce to grain-dealers to any great extent, and state that they take their own surplus produce to the nearest market to sell. Certainly this is the case with the petty zamindars and *lakhirajadars* and all classes who are in the habit of letting out land on produce rents; and not only do they sell the crop directly, but they are capable of holding it up in expectation of good prices. I have heard of cases where considerable stocks were found in a secret chamber of an ordinary raiyat's house, and the *Mohants* of the charitable institutions in particular are supposed to keep very large reserves.

* Report of Commissioners of Orissa famines, paragraph 8, Part II. There was however a poor crop in 1864-65, especially in Puri.

† Collector to Commissioner, No. 2860, dated 9th December, 1896.

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Growth of population.

198. It is difficult to reconcile the various estimates of the population in the early years of the century. In 1821 we learn from Mr. Stirling that the total population of the Province was 1,300,000 and that there were but 3 towns of any size,-Cuttack, Balasore and Puri,-with populations of 40,000, 10,000 and 30,000, respectively. During the settlement operations of 1840-45 an estimate was made of 2,500,000. It is hardly conceivable that there should have been an increase of 1,200,000 in twenty years, and I think Mr. Stirling's estimate must have been below the mark; the other is probably somewhat high, for in 1854 an estimate, based on the counting of houses * gave a population of but a little over 2,400,000. Just before the famine the population was estimated—chiefly from data furnished by the police—at three millions, and after it in 1867 at 2,100,000 †. In 1872 the first regular census showed the population to be 3,035,000, so that if the estimates of 1867 were correct, the population had in four years increased by 935,000, or by more than 44 per cent. This is obviously impossible, especially in days when immigration was almost unknown and the locomotion was slow and difficult. I think that the outside increase in five years, allowing for the return of those who had fled to other districts, may be put down at 20 per cent., which would give the population of 1867 at about two-and-a-half millions and make the loss of life in 1865-66 only half a million, which is not improbable.

The reliable figures as to population may be taken as :—

| | | | | | |
|---|---|---|---|---|---|
| 1843 | .... | .... | .... | | 2,500,000 |
| 1865 | .... | .... | .... | | 3,000,000 |
| 1867 | .... | .... | .... | (a) | 2,500,000 |
| 1872 | .... | .... | .... | | 3,000,000 |
| 1881 | .... | .... | .... | | 3,600,000 |
| 1891 | .... | .... | .... | | 3,800,000 |
| Present day | .... | .... | .... | (a) | 4,200,000 |

(a) Estimate.

This steady increase is in itself the most valuable evidence of the prosperity of the Province under British administration. It cannot, however, be said to be an unmixed blessing. In rather more than half a century the population has increased by 1,700,000, or 68 per cent., and in the same time cultivation has increased by about a third, and there is not much room left for further extention. The amount of land and agricultural produce available for the support of each individual has thus been reduced in the ratio of 100 to 79. The population now averages about 700 per square mile cultivated in Balasore, about 570 to the square mile of cultivation in Puri, and nearly 800 to the square mile of cultivation in Cuttack; while in some Thanas the density is much greater. So far the increase in the value of the surplus produce has gone far towards recompensing the cultivator, and a general modicum of necessaries has replaced the alternate want and abundance of former years. It is, however, certain that the limit has been nearly reached, and either the increase of population must be checked or the pressure relieved by imigration, or the standard of comfort reduced to a dangerously low level.

* See paragraph 36, Famine Commissioner's report of 1866, Part I.

† Commissioner to Board, No. 501, dated 24th July. 1867.



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# Part III.

## CHAPTER IX.

### A SHORT ACCOUNT OF ANCIENT ORISSA OR ODRADESA: ITS PLACE IN ANCIENT GEOGRAPHY, ITS HISTOY, PEOPLES, AND RELIGIONS.

An attempt is made in this introduction to bring together a short history of ancient Orissa. My excuse for quoting text rather than giving references is to save the time of those who have not ready to hand the works of the authorities quoted. I desire to express my deep sense of obligation to Mr. F. E. Pargiter, I. C. S., who has very kindly revised in part the draft of this chapter.

*(A) The place of Orissa in the geography of Ancient India.*

Sakas.

199. In the second book of the Mahabharata is given an account of the celebration of *Rajasuya* sacrifice, which is said to have been attended by all the kings in India. Amongst other kings ( who brought gifts ) were the king of the Sakas, identified as Scythians by Professor H. H. Wilson, and the Kings of Banga, Pundraka and Kalinga, identified by the same authority to be the inhabitants of Lower Bengal, Midnapore, and Ganjam.

200. Mr. F. E. Pargiter, I. C. S., in a paper on the Ancient countries in Eastern India ( As. Soc. Vol. LXVI, Part I, No. 2 ), gives evidence to show that five kindred races inhabited East Bihar and Bengal, namely, the Angas, Vangas, Kalingas, Pundras, and Suhmas, their countries being known by the same names, and that the connection between those races was explained by an ancient legend that they were descended from five eponymous kings of the same names who were sons of the queen of Bali, who was king of the Eastern Regions. It appears that those races were at first considered barbarians by the kings of the North-West, but they become Aryanised; and the Angas, Kalingas, and Pundras were raised to the same degree of esteem which the nations of Madhya-desa ( the North Western Provinces ) enjoyed. He attributes their elevation to some marked change which passed over Northern India. The alteration was most marked in the estimation of the Kalingas.

201. *Kalinga.*—Mr. Pargiter quotes from the Raghu-Vamca that, after the conquest of the Vangas, Raghu conquered Kalinga. The route to Kalinga was pointed out by the kings of Utkala and it lay south of the Kapica which he identifies with the Kansai or Cossye river in Midnapore, and which Lassen had identified with the Subarnarekha river.

This passage is also quoted by Dr. Rajendralal Mitra ( page 7 ), and would go to show that Utkala was a separate country from Kalinga. Mr. Pargiter finds that from the Kansai river southward a portion of Utkala intervened before Kalinga was reached. "The northern limit of Kalinga was approximately the Vaitarni, for the Mahabharata, describing the Pandavas' pilgrimage to all the *tirthas*, says :—After bathing at the junction of the Ganges and the sea, they travelled along the sea-coast towards the Kalingas and reached that people and the river Vaitarani at the same time. On its bank was Viraja-tirtha, the later Biraja-ksetra, the modern Jajpur. Kalinga therefore comprised modern Orissa about as far north as the modern town Bhadrak in the Balasore District and the sea-coast southward as far as Vizagapatam. Its limits inland are not clear. Lassen places Kalinga along the inner side of the Eastern Ghats from the Vizagapatam District south-westward as far as the Karnul District."

In support of the above we have the following from Professor Wilson's account of the travels of Hiouen Thsang :—

**Kalinga, the name given by Sanskrit and classical writers and by the people of the Eastern Archipelago, to the upper part of the Coromandel Coast, usually including Orissa.**

202. *Utkala and Odra—Odra or Udra*—After identifying Hughli, Howrah, Bankura, and Burdwan, together with the eastern portion of Midnapure ( including Tamluk ), as Suhma and Tamalipta, Mr. Pargiter cannot agree with Lassen in

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making the territory of the Odras more or less conterminous with Orissa. The Utkalas occupied the north of the Balasore District and the south was Kalinga. "Hence, it seems impossible the Udras can have inhabited any portion of (what is now known as) Orissa."

"In the last century Orissa included the tract of country between the rivers Rupnarayan and Subarnarekha (see Bengal Administration Report, 1872-73, page 40)." So that the name has not always denoted what it simply means now. In this connection, the titles of some our early Regulation may be studied.

After discusssing and suggesting the region occupied by Paundra, with which Udra was frequently associated, he says :—

These considerations give, I think, an indication where the Udra the territory was in ancient times. The eastern part of Midnapore belonged to Tamalipta and Suhma, hence there remains only the western part of that district which no other nation appears to have occupied; and if to this be added the modern district of Manbhum, the eastern part of Singhbhum, and perhaps the southern portion of Bankura, a well-defined tract is obtained, which no other tribe appears to have owned and which bordered on Paundra. I would suggest that this must have been Udra in ancient times.

And in order to explain the present position of the Uriyas, he continues :

If this be a reasonable inference, it discloses how an insignificant early tribe developed and spread during the confusion which prevailed in the dark times of mediaeval Indian history. I would suggest that the Udras must have pushed southward, overrun the whole of Orissa and Ganjam, and driven the Kalingas downward into the Vizagapatam district, till their further course was checked by the Dravidian powers on the south; then they must have turned westward and forced their way round in to the Southern portion of Chattisgarh.

*Utkala*—The Utkalas were well known, though not mentioned often in the Mahabharat. They are linked with the Mekalas (Bhisma-p., ix 348; Drona-p. iv. 122; Ramay. Kisk.-k, xli. 14), and with the Mekalas and Kalingas (Karna-p., xxii, 882). The position of Kalinga has been explained. The Mekalas inhabited the Mekal hills in the west and north of Chattisgarh. The Utkalas must therefore have occupied an intermediate position. From the passage quoted from the Raghu-Vamca with reference to Kalinga, it appears the Utkala territory stretched nearly as far as the R. Kapica or Cosaye in Midnapore; that passage does not mean it reached that river, for it was only after he crossed that river that Raghu had occasion to accept the guidance of the Utkal kings. From these data and the positions assigned to Paundra and Odra, it may be inferred that Utkala comprised the hilly tracts from Balasore to Lohardaga and Sarguja.

203. On this subject it would not be right to exclude the work of Dr. Rajendralal Mitra. He says :—

Odra is by far the most extensively used term for the Uriyas, and its vernacular form is Od or Ud. If this as a specific tribal designation be added to Kola, the generic name of the aborigines, we get Utkola, a Kola of the Ud class the subsequent conversions of Ut. into Ut and Kola into Kala being the results of phonetic decay or vernacular corruption,

This is, I think, speculation; the latter part of the derivation may be right (Mr. Pargiter is inclined to concur in it), but the former part is doubtful. He observes that in Sanskrit *Utkula* means a bird-catcher. We may, perhaps, ask whether this has any connection with the legend of the *fowler*, see paragraph 229.

Babu J. M. Das, an Assistant Settlement Officer, possessing great knowledge of Orissa, has doubts whether although different kings ruled Kalinga and Utkala, the peoples ever differed in race, dialect, religion or customs.

It seems very likely that the two kingdoms were welded into one during the reign of the Yabanas who were ultimately driven out by Yayati Kesari. Yayati restored the mage of Jagannath to the temple of Puri and his political capital was at Jajpur, his sway thus extending over the whole of modern Orissa.

**Extent of Ancient Orissa.**

204. To sum up, if we accept the evidence and suggestions setforth above, the area which forms the subject of this report, *i. e.*, the temporarily-settled area of the three districts, consisted in ancient time of portions of—

*(a) Kalinga,* from Chilka Lake to the Baitarani river, *i. e.,* Puri and Cuttack.

*(b) Utkala,* from the Baitarni river to the Subarnarekha river, *i. e.,* Balasore.

*(c) Suhma* and *Odra,* from the Subarnarekha to the northern limit of Balasore (and onward).

**Area.**

The areas known as Orissa from time to time have varied very greatly.

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*Before 500 A. D.*—From the Hooghly to about Vizagapatam, known more or less as Kalinga.

*474 A. D. to 1132 A. D.*—From Soro ( Kansbans river in Balasore ) to Ganjam, and on the east and west from the sea to Dhenkanal.

*1132 A. D.*—As Orissa. Extended on the south to the Vizagapatam district, probably not less than 40,000 square miles.

*1590 A. D.*—see Stirling's Account of Orissa, Todar Mull, and Man Singh's revenue—paying area, rather less than 14,000 square miles.

*1803 A. D.*—Modern Orissa. In 1828 A. D. the northern, central and southern divisions were made, and correspond nearly to the modern districts of Cuttack, Puri, and Balasore with part of Midnapore.

It may be added that Dr. Rajendralal Mitra quotes the *Ain-i-Akbari* to show that about two centuries ago Orissa consisted of "the five sircars or districts of Jelasir, Bhadrak, Cuttack, Kallendraput (Kalinga Dandiput) and Rajmahendri. The first, however, included Midnapore, Mahakami Ghat and Narainpur. The province of Orissa may therefore be said to have extended from Midnapore to Rajmahendri, the portion between the Chilka Lake and the Subarnarekha having been ceded to the Mahrattas in 1757".

### *(B) The soil-its formation.*

205. Roughly speaking the temporarily-settled area which forms the subject of this report amounts to 5,000 square miles (Cuttack 2,300, Balasore 1,700, Puri, excluding Khurda, 1,000).

It is not too daring to say that in pre-historic times the whole of this area was washed by the sea.

In the modern Orissa, we still find a barrier of hills and forests on the west, "and a plain, level country extending from the foot of that barrier to the sea evidently of alluvial formation, the uniform surface of which is not disturbed by a single rocky elevation nor does a single stone occur between the beds of iron clay lying on the western frontier and the Ocean, if we except the curious spheroidal concretions of calcareous matter or limestone nodules which are found very generally dispersed ( Stirling )." Sir William Hunter also gives us some very picturesque accounts of "Land Making." The process is still going on and may be observed in the shallowness of the Chilka lake which once was a harbour for sea-going ships and is now rarely more than 6 feet deep. Two modern and interesting proofs may also be given—

(1) The cave inscription which tells us of the sea-made origin of the caves, the sea being now 50 miles away.

(2) The increase in area of certain estates on the sea-coast, especially in the Puri District, since the last survey of sixty years ago.

206. We have evidence that systematic cultivation probably did not begin in the tract under report till some 1,500 years ago, but that the earliest cultivation was probably in 800 B. C. We find in the Mahabharata that the tribute brought by the kings of Kalinga consisted of ivory and elephants, and Professor Wilson considers that the tributes brought by each Raja are typical of the trades in which their kingdoms engaged. Hiouen Thsang ( 629 to 645 A. D.) travelled from Jajpur to Khandagiri through thick forests. Even in the reports of the last settlement sixty years ago damage from wild animals is a frequent cause of low assessment. The cultivated area in the 5,000 square miles has increased from 2,600 square miles in 1837 to 3,400 square miles in 1899.

Commencement of cultivation.

In the above remarks I only wish to imply that in earliest times the sea came close to the hills, and that cultivation in Orissa is *comparatively* modern.

A geological account of Orissa may be found both in Stirling and Hunter

### *(C) History.*

207. I do not attempt to give more than a few important dates and a brief account of the ancient peoples and their religions. Stirling and Hunter give us the early, and Mr. Toynbee the later, history.

208. ***Important dates in the ancient history of Orissa.***—The earlier dates must of course be taken as approximate only.

*800 B. C. (?)*—The Kalinga dynasty.

*477. B. C.*—The receipt of the sacred tooth of Buddha by the King of Kalinga, *i. e.*, the introduction of Buddhism. This date must, however, be reduced to a few years later, for the year of Buddha's is now fixed at 477 B. C.

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*250 B. C.*—The pillar at Dhauli erected by King Asoka after the establishment of Buddhism.

*473 A. D.*—The expulsion of the Buddists and the foundation of the line of Lion kings. The rise of Jajpur.

*500 A. D.*—The importation of 10,000 Brahmins from Oudh.

*625 A. D.*—The completion of the Bhubaneswar temple, *i. e.*, establishment of the worship of Siva.

*961 A. D.*—The foundation of Cuttack town.

*1132 A. D.*—The Ganga Vansa dynasty.

*1198 A. D.*—The building of the present temple at Puri, *i. e.*, the re-establishment of Vishnu. ( Vishnu is said to have lived at Puri from the beginning of all time ).

*1203 A. D.*—Afghan invasions into Bengal begin.

*1282 A. D.*—The completion of the Sun temple at Kanarak, dedicated to the Sun in honour of his cure of Samba, son of Krishna, ( There is a temple at Lahore similarly dedicated, see Travels of Hiouen Thsang, Part I., Vol. XVII, Royal As. Soc, Journal, but the cure of Samba is supposed to have occurred on the site of the Kanarak Temple in Orissa ).

*1471 A. D.*—Alliance with Muhammadans.

*1527 A. D.*—The passing away of Chaitanya.

*1556 A. D.*—The invasion of Kalapahar.

*1568 A. D.*—The sacking of Cuttack and plunder of Puri by the Muhammadan Governors of Bengal.

*1574 A D.*—Daud Khan becomes King of Orissa.

*1576 A. D.*—Death of Daud Khan.

*1578 A. D.*— } Todar Mull and Man Singh—Mogul supremacy—

*1592 A. D.*— } Khurda dynasty—Survey of the Province.

*1685 A. D.*—English occupation of Pipli on the Subarnarekha.

*1632 A. D.*—English occupation of Balasore.

*1742 A. D.*— }

*1751 A. D.*— } Maharatta conquest.

*1803 A. D.*—British conquest of Orissa.

209. ***The ancient peoples of Orissa; their history.***—The history of the people is entirely bound up with that of their religion, and it is impossible to keep the two apart. The earliest legend of occupation is at Khandagiri, where sandstone rock is found. I believe that this stone is found in no other part of the temporarily-settled area except in Naraj and in the Government estate of Khurda. It is also found in Dompara and Atgarh (Tributary States). The legend says that Hanuman and his monkeys, when they were bringing stone from the Himalayas for ***Rama's*** bridge dropped some blocks in their flight. These blocks are the hills of Khandagiri and Udaigiri. Legends regarding giants and tanks and mounds built by giants may be found in many parts, *e. g.*, Jajpur is the centre of the navel of Gaya Asur, the head being, I believe, at Gaya (Stirling). There is a fine tank built by giants 3 miles north of Bhadrak, and in Cuttack district we have a Pargana named Asureswar.

**Hindu occupation.**

210. From the evidence of all the authorities, (Stirling, Macpherson, Briggs, and Hunter) we are able to say that effective Hindu occupation did not begin, speaking approximately, till 473 A. D.; we may therefore try to find out what tribes inhabited Orissa before the fifth century and whence they came. The word ***effective*** must be inserted in view of the legendary Aryan conquest and the foundation of the kingdom of Kalinga (Hunter, Vol. I, P. 188).

**Subjugation of Aborigines.**

211. Mr. Pargiter, in his paper already referred to, dealing with the earliest period to which the Mahabharata relates, concludes by saying that—

Magadha, Videha, Vaicali, appear to have been the outposts of Aryan conquest and colonisation. Anga, Vanga, Kalinga, Paundra, and Suhma with Tamalipta Odra were kindred nations, which were not of Aryan stock and were not subjugated by the Aryans, but passed under Aryan influence and became Aryanised. Utkala was a congeries of Kolarain tribes occupying the hilly tracts, where they are still found. The Utkalas, being so-called aboriginal tribes, must of course have come into this region first; and their position among the hills also suggests the same inference. They must have been driven into the hills by latter invaders.

Mr. Pargiter suggests that the Kalingas, Odras, etc., must have come from the Bay of Bengal, *i. e.*, that they came from the sea, settled on the sea-coast and gradually carved out kingdoms inland. "Lastly, came the invasion of the Aryans into Eastern India. Their conquering vigour seems to have spent itself by time they subdued Videha and Magadha, for they had already passed through many generations in the plains of North India, and the enervating climate and easy conditions of life had surely, if slowly, modified the constitution which their ancestors had acquired in colder and hardier climes."



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The Hindus.

212. General Briggs, F. R. S., in a paper read before the Royal Asiatic Society in May-June 1852, appears to have been among the first to notice the uniformity of habits of all the wild tribes of India. Amongst other points he desired to establish the fact that the Hindus entered India from a foreign country and found it pre-occupied by inhabitants whom they gradually reduced to serfdom; that they introduced the Sanskrit language and municipal institutions; that in every respect, both as regards race and language, the Hindus are different from the inhabitants they found in occupation, and that the latter have a common origin. These conclusions are well established at the present day.

He quotes Professor Wilson's opinion that the Hindus were a northern race and fair complexioned, and that at the time of Manu the Hindus had not passed the 22nd degree of north latitude, having probably been checked by the Satpura Range. The earliest monument of the Hindus in the Deccan is of 450 A.D., and it occupied the Hindus four to five hundred years to reach Mysore. About the same time the Hindus entered Orissa in effective numbers, *i e.*, in 473 A. D., but kept to the plains, leaving in independence the inhabitants of the hills. In all cases of conquest the aborigines became serfs and outcast village watchmen. In this connection the quotations from Dr. Rajendralal Mitra, given in paragraph 217, may be read. He is of opinion that a mixed race professing forms of Aryan civilisation was already to be found in Orissa, and this is no doubt true, for Buddhism had prevailed many centuries there, and Buddhism ignored the riged limits of caste.

Buddhism began in Bihar about five centuries before Christ and rapidly spread in all directions. It soon reached modern Orissa and was carried into Ceylon in less than a century after Buddha's death. The Buddhists thus entered Orissa from the north (see the end of paragraph 215). In the following paragraphs I do not wish to set forth more than the results of General Briggs' observations. He does not tell us of the earliest institutions of the Hindus; he does not do more than point out the difference between them and the aboriginal tribes at the time they came in contact with each other. Other writers such as Maine and Phillips may be referred to for information regarding the early Hindu village communities. I quote one short sentence from Phillips (Tagore Law Lecture 1874-75) taken from Hunter, Vol. II :—

**The Hindu village had a non-Aryan predecessor in Orissa in the Khand hamlet, but that wanted the corporate life of its successor and was merely a collection of families.**

Possibly these remarks may apply to all early communities.

General Briggs shows us how the aboriginal tribes must have over run the country as hunters or herdsmen, and how they have now become slaves and watchmen where they have been conquered. He enumerates eleven points of difference between these tribes and Hindus, *e. g.*, caste, marriage of widows, eating of beef, drinking liquor, eating of ready-cooked food, spilling of blood, self-created priesthood, burying of dead, patriarchal instead of municipal institutions, trial by heads of tribes instead of by courts of equals, and illiterateness. He shows further differences in moral virtues and occupations, and even quotes Herodotus in support of the distinction between the pastoral, hunting, and fishing race of India and the race who dwell in cities. Among other aboriginal races are described those which inhabit the territory between the eastern mountains "and the sea coast, having the Chilka lake for its southern, and the port of Pipli (on the Subarnarekha) for its northern boundary. This territory is occupied by the Saurahas, the Bandwaras and the Khonds". General Briggs agreed with Captain Macpherson (who made a special study of these tirbes) and Stirling in saying that—

**The Hindu race did not enter Uriadesa till about the year 473 A. D. nor did they attain the zenith of their power till the ninth century. They introduced their municipal form of Government as elsewhere into the plains, but the aborigines remained unsubdued and continue so till this day.**

He then quotes a very large number of authorities as to the similarity of features of all the aboriginal tribes, and concludes that their features are Scythian and quite distinct from the Caucasian type. As regards language, in the beginning of the century, Sri W. Jones and Mr. W. Colebrooke divided the languages of Indian into northern and southern, the former containing nine-tenths of words of Sanskrit origin, and the latter having a separate origin. Most especially marked

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