

FINAL REPORT
ON THE
SURVEY AND SETTLEMENT
OF THE
PROVINCE OF ORISSA
(TEMPORARILY SETTLED AREAS)

1890 TO 1900 A.D.

VOL. I



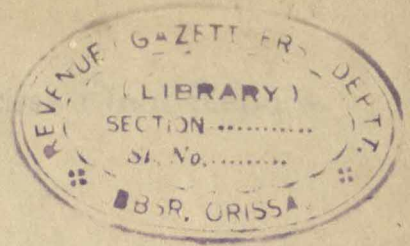
By

S. L. MADDOX, I. C. S.

Settlement Officer



REPRINTED UNDER THE AUTHORITY OF BOARD OF REVNUUE, ORISSA



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Glossary of Vernacular Terms in the Orissa Final Report.

- Abadhans**—Village pandits or teachers.
- Abwab**—Illegal cess.
- Achhara**—The light and worthless refuse of grain.
- Ada**—(*Zingiber officinale*)—Ginger.
- Adhajama or nisfi bazyafsti**—The tenures held rent and revenue free before the last settlement (1837) and resumed and assessed at half-rates at the last settlement.
- Adkikari**—Head-priests of temples.
- Ail**—The raised boundary of a field.
- Aima**—Learned or religious men. Used to denote grants made to religious and other Mahomedans.
- Akhu**—(*Saccharum officinarum*)—Sugarcane.
- Akhubadali**—The temporary exchange of a field not suitable for sugarcane for one that is suitable.
- Amli**—Is the era according to lunar months current in Orissa, but is liable to considerable variation and is regulated by the solar *Vilayati* year, which commences on the 1st *Assin*. The lunar *Amli* year commences in Orissa on the 12th day of the second-half of the lunar month *Bhadra* (*Vide* page 374 of the Appendix).
- Anabadi**—Uncultivated and unoccupied land.
- Arhar**—(*Cajanus indicus*)—A kind of pulse.
- Arua**—(See *Atap*).
- Assamis**—During the Mahratta rule farming leases of estates were put up to auction in Nagpur and were bought sometimes by two or three persons, who came to Orissa and tried to levy what they could, and were responsible for the collections of revenue. They were known as *Assamis*.
- Asu or Beali**—(*Oryza sativa*)—Rice grown on high lands.
- Atapoor Arua**—(Rice) prepared from paddy by drying it in the sun, and then crushing it in the *dhenki*.
- Awal**—First class (land).
- Badar fard**—Mistake list.
- Badshahi**—Royal.
- Bahal**—Stands for *Lakiraj*—*bahal*, i.e., revenue-free lands confirmed as such at the last settlement.
- Baigun or Brinjal**—(*Solanum melonga*)—A vegetable.
- Baishnabs**—Religious mendicants. There is also a caste of that name.
- Baliu or Baliara**—Very loose sandy soil which grows poor specimens of the *rabi* crop.
- Balia matal**—A loam, with a large admixture of earth; a rich sandy loam, the most common of soils, and varying much in composition and fertility.
- Balichar**—Pure sand unfit for cultivation.
- Banghi**—A bamboo stick with strings from each end used across the shoulder for carrying loads.
- Baradaran Jagir**—*Jagir* assigned to brothers and other near relatives for their support.
- Baraj**—The *pan* garden.
- Barhai**—Carpenter.
- Bari**—Homestead land.
- Barkandaz**—A guard.
- Barua**—A village headman (found only in North Balasore).
- Bati**—20 *mans*—Equivalent to from 8 to 20 acres, varying with the local standards of measurement.
- Batwara**—Partition.
- Bazefasal**—Miscellaneous crops.
- Bazyafsti Tenures**—Tenures held rent and revenue-free before the last settlement (1837) and resumed and assessed at the last settlement.
- Bazyaftidars**—Holders of resumed tenures.
- Bazyafsti kamil or pura jama**—Tenures held rent and revenue—free before the last settlement (1837), and resumed and assessed at full rates at the last settlement.
- Bechapari**—Literally “without roof”. The word is issued to designate uninhabited villages.
- Bena**—(*Andropogon miliaceus*)—Thatching grass.
- Benapat**—Waste covered with thatching grass.
- Bethia**—One who labours without hire. ‘*Bethi*’ is labour which is not paid for.
- Bethia Bauri**—Labourers of the Bauri caste (holding *Jagirs*) bound to render service when called upon to do so.
- Bhadai**—(*Oriza sativa*)—Autumn crop.
- Bhadra lok**—Respectable persons.
- Bhag or Dhulibhag**—Means literally a ‘sharing’ of the dust. A rent in kind equal to half the produce, including bye-products.
- Bhagbandhak or Phalbandhak**—Is a common form of usufructuary mortgage.
- Bhagchas**—Land cultivated by a raiyat for his landlord on condition that he would pay a certain share of the produce, generally half-share.
- Bhaiya**—Relations.
- Bhandari or Napit**—A barber.
- Bhat**—Village bard.
- Bhaurias**—Field books or khasras.
- Bhians**—Rent rolls.
- Bhoi or Kothkaran or Baithkaran or Sethi**—Village accountant.
- Bhoimul or Bisoi**—Divisional (*bisi* or *Khand*) head.
- Bhupati**—Lord of the soil.
- Biali**—(*Oryza sativa*)—Autumn rice sown in May-June and harvested in August and September.
- Bibaha**—Magan—Subscriptions raised for meeting the expenses of the *zamindars* for marriage in his family.
- Bida**—Rake.

- Bigha*—A local land measure which is equal to one-third of a *man*.
Birhi—(*Phaseolus radiatus*)—A kind of pulse.
Bisa—Weighs 120 tolas or one-and-a-half standard *seers* and is divided into 20 to 30 *pais*=1/80 *chhala*.
Bisa kati—A steel yard used for weighing vegetables, fish and utensils, &c.
Bisi or Khand—Villages grouped into large divisions of ten to fifty square miles.
Biswa=1/16th of a *gunth* or 1/400th of a *man* (see *Man*).
Bramhottar—Grants of lands assigned for the support of Brahmans.
Chaharam—(lands)—Fourth class soils.
Chakbandi (Sheet)—A detailed rent roll showing the area and class and rate of rent for every plot in each holding.
Chaki or Janta—Flour Mill.
Chakran Tanki (lands)—Service lands held on a quit rent.
Chakria—An unskilled labourer who is engaged by the year.
Chana—(*Lathyrus sativus*)—Gram.
Chandina—Homestead lands of shopkeepers artisans, and those of the labouring classes, who, having no arable land in the village, pay rent for homestead lands only.
Chandinadar or Chandina raiyat—Holders of *Chandina* tenures.
Chandinadar-ko-delu-patta—A *Chandinadar* to whom a lease for cultivated lands, similar to a *thani* lease, was given at the last settlement, fixing his rent for that settlement.
Chati (land)—Land occupied by lodging-houses on the Trunk Road.
Chaukidar or Choukia—Village watchman.
Chaulia matal—Brownish soil, very friable, common and fairly fertile.
Chaupani—A tax levied by the *killajat* chiefs for military service.
Chauria—A hard clay which is very liable to cake on being exposed to the sun when ploughed.
Chela—Disciple.
Chhar—A small remission or rent.
Chhala—(Measure)—80 *bisas* (see *Bisa*).
Chhatia—Watchmen, landlords' peons. *Chaukidars* are called *chhatias* in the Puri district.
China (*Paricummlia ceum*)—A kind of millet.
Chouth—Tribute levied by the Mahrattas.
Chula—Hearth.
Dabir Jai or Dabijya (land)—Is the dower given by the father on the occasion of a daughter's marriage.
Dakdehati—Zamindari *dak* cess.
Dakhal bandhak—Loans on a usufructuary mortgage. No interest is charged, but the Mahajan obtains possession until such time as the debt is repaid or for a certain period, at the expiration of which the Mahajan returns the lands to the mortgagor, the enjoyment of the lands for that period being considered equivalent to principal and interest.
Dakhil kharij—Process of registering mutations.
Dal—A general term for pulses.
Dahua—(*Oryza sativa*)—Spring rice sown in November—December and harvested in March.
Dan or Dutta—It is a gift, and is used of grants, to persons other than Brahmans, especially for services. Some times also used of grants to Brahmans.
Dandidar—Weigher appointed to supervise a market.
Dangar or Thenga or Thangi—High lands that suffer from want of silt and water.
Dao—A small toothed sickle for reaping. A large knife with straight and heavier blade for cutting jungle wood and fodder is also called a *Dao*.
Daroghas—Sub-Inspectors (Police).
Dastak—Warrant.
Dasti—(measure) Four half inches or the width of a man's fist across the knuckles.
Debottar—(Bestowed on the Gods)—Lands assigned for the worship of an idol.
Dhaincha—(*Sesbania aculeata*)—A crop cultivated for fibre.
Dhangira—Sugarcane cuttings.
Dhania—(*Coriandrum sativum*)—Coriander seed.
Dhauia matal—A greyish white soil which is usually fertile.
Dhenki—The grain-husker.
Dhipa—High arable lands.
Dhoba—Washerman.
Dhoti—Cloth for wearing.
Dhuan patra—(*Nicotina tabacum*)—Tobacco plant or 'smoke leaf'.
Diha—Homestead land (including the garden as well as the house site).
Doem or Dayam—Second class lands.
Dofasali—(land)—Double-cropped area.
Doli—Bamboo baskets plastered over with mud and cow-dung for storing paddy.
Dorasa—A mixture of clay and sand in nearly equal parts.
Dudhia matal—A white soil, very friable and fairly fertile ; grows fine paddy.
Ekhrajat, or more properly *Ikhrajat*, is an Arabic word meaning 'expenses'—After the conquest of Khurda in 1804, Government continued to make certain cash payments to the Puri Temple, which was held in high respect by the Hindu communities through out India. In 1858, in difference to very strongly expressed views in England that the Government should divest itself of all connection with religious endowments in this country, it was decided to grant certain lands in lieu of the cash payment. These estates are known as the *Ekhrajat Mahals*.
Ekpadiya—Zamindar's rent roll.
Ekrarnama or Iqrarnama—An agreement.
Fasal-bandi—An assessment made on the basis of cropped area.
Gaba or Jara—Castor oil.
Gahama—(*Triticum sativum*)—Wheat.

- Gamcha*—A towel-like piece of cloth generally used for bathing, &c.
Ganja—(*Gannabis sativa*)—A kind of drug.
Gauni—(Grain measure)—This is a basket with a capacity varying locally from 1 1/2 to 6 seers of rice and called accordingly *tin siriagauni* ; '*charsiagauni*', &c. &c.,
Gours or Gonds—Village cowherds.
Gengutia—A clay containing and admixture of *genguti* or lime, to be met with near those river beds which abound with nodulous limestone.
Gharbari—Homestead lands including *bari*.
Ghat Manjhi or Nauria—Ferryman or boatman.
Ghee or Ghi—Clarified butter.
Gomasta—A servant of the Zamindar or the *Ijaradar* who collects rents from the tenants.
Gora—A very common light-coloured soil.
Gram debati—Village deities.
Gunth—(land measure)—One twenty-fifth of a *man*.
Gur—Molasses.
Guru—(Literally, heavy)—A variety of *Sarad* paddy.
Halabira—A sheaf of corn given to the *Chaukidar* at the harvest time by each tenant.
Haldi—(*Curcuma longa*)—Turmeric.
Handi—An earthen pot used for cooking, &c.
Harar—(*Cajanus indicus*)—A kind of pulse.
Hari Kharcha—(Cuttack)—A kind of *abwab*. Annas four to rupee one for tenant to meet the expenses of religious festivities.
Hasilat or Khalisa—Lands other than *Lakhiraj*, i. e., lands comprised in a revenue-paying estate.
Hastabud—The area in which the zamindar collects direct from his tenants.
Hat—Market.
Hatkar—(Cuttack)—Market dues.
Hatwa or Hatua—The merchant class.
Hazur tahsil—Direct collections.
Hira or Hida—*Ail*—(See *Ail*).
Hinihayati lakhiraj—Lands granted revenue-free for the life time of the holder.
Ijaradar—(*Ijara*, a lease)—The farmer of a village, market &c.
Inkar—A reed used in enclosing and thatching *pan* gardens, and for the support of the young *pan* plants.
Istimarari mustajiri—Farming leases granted in perpetuity.
Istimarari Patta—A permanent lease.
Jaba—(*Hordeum hexastichum*)—Barley.
Jala—The ordinary rice lands of the village, not including houses and gardens.
Jalapat—Low lands.
Jalakarmahals—Estates consisting of rights of fishery.
Jalpahi—Certain lands known as '*Jalpahi*' (in Balasore) were acquired by the East India Company for the manufacture of salt in the beginning of the century under perpetual leases.
Jagir—Service lands.
Jagirdars—Persons holding lands free of rent in consideration of their services to an individual or the community.
Jama—Revenue or rent.
Jamabandi mist—The collection of papers relating to the proceedings for the settlement of rents.
Jamawasilbaki—A statement of demand, collection and arrears for each tenant.
Jara or Gaba—Castor oil.
Jarib—Measurement.
Jarimana—A fine.
Jhil—Low lands ; also a narrow water-course.
Jhora—A narrow water-course.
Jogi—A religious mendicant.
Kabala—Deed of sale.
Kadimi (raiya)ts)—Resident and hereditary cultivators having a customary right of occupancy.
Kakuri—(*Cucumis sativus*)—Cucumber.
Kala or Kalamati—(Black land)—Lands lying round the village site, over which the washing water of the village is poured and all village refuse is thrown.
Kalamatal—Black, soil, usually of low levels.
Kamar—Blacksmith.
Kanda—Partly refined molasses.
Kandamul—(*Cucumis melo*)—Sweet potato.
Kantari—(*Saccharum officinarum*)—A variety of sugarcane.
Kanungo—A subordinate revenue official.
Kapa—(*Gossypium herbaceum*)—Cotton.
Karhia—This is a system of cash loan to meet the kist of rent due in November before the winter rice is ripe. It is repaid in February in grain at the market rate then current, with interest at about 20 per cent.
Karja—Money loan.
Karji—An agent appointed by the *talukdar* for collections where there were no hereditary headmen or where the *padhan* had been dispossessed. The term is now generally applied to rent collectors.
Kar-pahi or thani-pahi—Lands cultivated by a *thani* raiyat which did not previously form part of his *thani* holding or tenure.
Karta—The head of the family.

- Katki seer**—The *seer* in common use in Cuttack and Puri. It weighs 105 *tolas* or 2·7104 lbs. A *Avoirdupois*.
- Kela**—A class of wandering beggars.
- Kenkshiali pariya**—“Uplands where the foxes have their holes”.
- Khai**—Fried rice, sometimes seasoned with sugar, when it is called *mudki* or *ukhda*.
- Khai**—A kind of sugarcane mill, in which the canes are pressed between rollers, horizontal or vertical, turned by hand or by bullocks.
- Khairat**—The name was used of grants of lands to mendicants and other poor Hindus, and sometimes also of grants for charitable purposes.
- Khairatdar**—The holders of *khairat* land.
- Khali** (soil)—An admixture of clay and limestone dust.
- Khalsa** (lands)—(See *Hasilat*).
- Khama alu**—(*Dioscorea sativa*)—The true yam.
- Khamar**—Grain store. Also signifies a proprietor's private lands.
- Khanabari**—Homestead lands in the possession of proprietors.
- Khanapuri**—Record-writing (*khana* means column and *puri* means to fill up).
- Khandait or Bhuyan**—Literally, swordsman, i.e., the wearer of the *khanda kharga* or sword. Was originally chief of *paiks*; a *khandait* is now scarcely distinguishable from a *paik*.
- Khara**—(*Spinacea oleracea*)—A variety of spinach ordinarily grown in *bari* lands.
- Kharcha**—Miscellaneous collections.
- Khardapani or Khanapani**—A kind of *abwab* taken by the *gomastas* similar to *Gomasta kharch*.
- Kharida** (lands)—Land sold rent-free or at a quit rent by the proprietors during the Hindu, Moghul, or Mahratta rule.
- Kharidadars**—Purchasers of *Kharida* lands.
- Kharidagi** (estates)—Estates formed of *Kharida* lands, often known as *Kharidagi bazi Asamiyan*.
- Kharida**—Jamabandi (Lands)—*Kharida* lands assessed to revenue.
- Khasra** (form)—A field index.
- Khatian** (form)—A detailed record of each tenancy.
- Khet**—Field.
- Khewat** (form)—An abstract record of the rights of proprietors and teunre-holders.
- Khulti matal or Khari matal**—A chalky soil, fairly fertile.
- Khurpi**—An instrument for scraping weeds or grass.
- Khushbash**—Respectable *thani* and resident raiyats. Also a kind of revenue-free grant to Brahmans and other better class Hindu cultivators for their houses.
- Killajat**—Estates of which the revenue was fixed by Regulation XII of 1805 are known as *Killajat* estates.
- Kimbiriamatal**—Slate (crocodile) coloured soil.
- Kist**—Instalment of revenue or rent.
- Kist Khilaf Siwai**—(Cuttack)—A collection of at annas six per rupee on arrears. This is not common as no interest is usually charged on arrears; it is mentioned in *pargana Beruan* only.
- Kita or Kiari**—The plot or portion of a field surrounded by a *hira*.
- Kodali or Kuri**—Mattock.
- Kolhua**—This is the commonest form of sugarcane-mill.
- Kos**—2,000 *dhanu* or 4,00 yards.
- Kotwal**—The assistant of the ‘*Amil*’.
- Kula**—A flat basket for winnowing.
- Kulthi**—(*Declichus biflorous*)—A pulse.
- Kumbhar**—Village potter.
- Kunda**—The fragments of husks and the outer shell covering the grains of rice.
- Kuthia or Halia**—A class of unskilled labourers engaged by the year and paid daily in kind.
- Laghu**—(*Chota, Majhla, Bara*)—(*Oryza sativa*)—The winter rice is sub-divided according to the amount of water it requires into *guru* or heavy and *laghu* or light, and the latter again into small medium and large.
- Laikpadia**—Culturable waste land.
- Lakhiraj**—Revenue-free land.
- Lakhiraj bahaldars**—Revenue-free properties, holding their lands free of revenue in perpetuity.
- Lakhiraj bazyafiti**—(See *Bazyafiti*).
- Madad Mash**—Grants of land to learned Muhammadans for their help and maintenance.
- Magan or Mathout or Chanda**—Subscriptions or cesses levied by the zamindar for special purposes.
- Mchal**—is used for ‘estate’ or “belonging to the estate,” i.e., not in the possession of tenants holding under tenure-holders or other middlemen.
- Mchi or Moi**—Harrow.
- Makka**—(Zeamays)—Maize.
- Malguzar**—Revenue Payer.
- Malikana**—Allowances paid to a proprietor on his becoming recusant.
- Mali**—Gardner.
- Man**—A local measure, contains from .33 to 1.21 of an acre.
- Mandua or Mandia** (*eleusine corocuna*)—A millet grown both as an Autumn and as a Spring crop.
- Marfatdar**—Agent, trustee.
- Morh**—Is equal to 905 grains Troy.
- Math**—A religious institution resembling a monastery or abbey.
- Mathadhikari**—The head of a *math*.
- Mathi**—Earthen pot for keeping water.
- Matial**—Is a kind of soil which includes a large proportion of clay.
- Matwalli or Darogah**—The trustee of a Muhammadan Shrine.

Maund—Forty *seers* (one *seer*=2·0532 lbs. Avoirdupois).
Maurasi—Hereditary.
Maurasi Sarbarakari—The hereditary property of a *Sarbarahkar*.
Mauza—Village.
Mauzawar—Village by village.
Mazkuri (estate)—Specified (i.e., in the rent roll) estate.
Mehtars or **Haris**—Sweepers.
Milan khasra—Is a total of the *khasra* pages showing the different classes of land into which the total area of the village is divided.
Minha—Lands left unassessed. Generally lands granted free of rent for the site of a house and garden.
Misl—Record.
Miyadi Sarbarahkari—A temporary tenure held by a *Sarbarahkar*.
Mohant—The abbot of a monastery.
Mot khasra—A form used for entering the area columns of the *khasra*.
Maafi or **Maafi kharida**—Land bought for a consideration from a zamindar or *talukadar* free of assessment. These lands were confirmed as revenue-free at the last settlement.
Mug or **Mung** (*phaseolus mungo*)—One of the pulses.
Muharrir—Subordinate vernacular clerk.
Mulia—Day labourer.
Munsarim—A superior vernacular clerk.
Muqadam or **muqaddam** or **mukadam** or **Mukaddam**—(An arabic word meaning headman) A class of proprietary tenure-holders or sub-proprietors.
Mustajir—Lessee.
Nai—Twine.
Naibs—Resident managers.
Nalaikpadia—Unculturable waste-land.
Nalita—(*Corchorus capsularis*, *corchorus olitorius*)—Jute.
Nangal—Plough.
Nankar estates—Estates consisting generally of scattered villages or portions of villages assigned for the support of high officials or of friends and dependents of the Sovereign.
Nijchas—Land cultivated by the proprietor or proprietary tenure-holder, but which is not true *sir*.
Nij jot—Is the private land (or true *sir*) of the proprietor or proprietary tenure-holder.
Nij kot—Jungle and waste-lands in the possession of a *Khandait*. (This is one of the three parts of the property of Garh Haldia divided at Mr. Wilkison's Settlement.)
Nij mauza—Means the land belonging to the original estate of the village.
Nikhat—Whatever is buried in the land ; also means minerals.
Nullahs or **Jores**—Drains.
Nuna jami—Land which is more or less of a saline nature.
Nunia (called *nunichar* while out of cultivation)—Soil which has been inundated with salt water and has not recovered ; may or may not be in cultivation.
O laro—A long coffin-shaped basket of split bamboo fitted on to a cart for carrying grain.
Oger or **ogaira** or **wagaira**—"And others".
Padhan—A class of proprietary tenure-holders or sub-proprietors.
Padika—Rod for measuring. A bamboo pole varying from 7 to 12 feet in length.
Pahi—Raiyats whose rents were not fixed for the term of settlement ; non-resident raiyats as distinguished from *thani* or resident raiyats.
Pahikasht—Lands cultivated by *pahi* raiyats.
Paiks—Hereditary landed militia. They are road and *ghat* patrols occupying a position similar to that of the village *chaukidars*.
Pakhias—A shade made of palm leaves to protect the head and back from sun and rain.
Pal—Silt enriched lands on or near the banks of rivers.
Pulang—(*Rottlera tinctoria*)—A tree the fruits of which yield a kind of oil which is used for lighting. The oil is an excellent medicine for burns.
Pan—(*piper betel*)—Betel leaf.
Panamohure—(*Pimpinella anisum*)—Aniseed.
Panidhan or **Katdhan**—The portion of a rent fixed in cash which is payable in grain at the current market rate.
Panikar—Water-rate.
Pani-gahira—"Water-holes".
Panigrahi—The head of a Brahman *Sasan* village and keeper of its title deed, rent receipts, &c. is generally known as *Panigrahi*.
Pankua—Black mud unmixed with sand, such as is found at the bottom of ponds and tanks.
Pansia—A loose though comparatively fertile soil.
Pao or **poa**—Four *chhataks*, one-fourth of a *seer*.
Parcha (form)—Abstract of the draft *khatian* given to the tenant, sometimes known as a *jamabandi* slip.
Pargana—Name of a fiscal division of the Moghul period. It is still in use.
Parganawar—*Pargana* by *Pargana*.
Parsethis or **pursethis**—A class of proprietary tenure-holders or sub-proprietors.
Partial Bhauria—A measurement made periodically to ascertain the extension of cultivation.
Patna—It means primarily homestead rather than arable lands. Small villages are also called *Patnas*.
Patsala kharach—A fee to defray the cost of maintenance of a school at the zamindar's residence generally three pies per head.
Patta—A lease given to a raiyat showing his land and his rent and the period for which it was fixed.
Patta Salami—A fee for the grant of a new lease of land.
Pattu—An alluvial soil, formed from silt deposited by floods.

- Pauti*—Rent receipt.
- Peshkas* or *Peshkush*—Quit revenue.
- Phulbhag* or *Rajbhag*—A division of the fruits or grain only, the straws or other bye-products being left with the cultivators ; a less common form of produce rent.
- Phuti*—(*Cucumis momordica*)—Cucumber.
- Piada*—*Kharch* or *Piyada-miyadi*—A fee, usually amounting to one pice per rupee of rent made nominally to cover the cost of maintaining collection peons.
- Pir*—A Muhammadan Saint.
- Piria*—Oil-cake.
- Pirattar*—Lands assigned for the support of the shrines of Muhammadan Saints.
- Piraleh* or *pirait* or *Paitrati*—Ancestral *jagir* or *nankar* lands.
- Piyadamiyadi* or *Talabana*—A fee varying from one and a half to three annas per diem, and realised from a tenant by the peon sent either to demand rent or to summon him to the zamindari *kachari*. A portion of this fee goes to the peon, and it varies with the number of days he is engaged.
- Pota*—Crops.
- Para jama* or *Kamil Bazyafiti*—(See *Kamil bazyafiti*).
- Purohit*—Priest. (*Despurohit*—Priest appointed by the zamindar. *Kulpurohit*—Hereditary chaplain of a respectable family).
- Qadam Rasul*—Muhammadan endowments of shrines where the prophet is believed to have set his foot.
- Qaulnama* or *Sanand*—Acknowledgements granted to the proprietors of Aul and similar estates for the agreements executed by them.
- Rabi*—Spring crop.
- Rahadari*—A free levied for the cost of sending remittances to the tresasury under escort.
- Rahbars*—Road patrols.
- Rahan bandhak*—Loans on simple mortgagage usually bearing interest at six pies per rupee per month.
- Rajwara*—Lands excluded from the Moghul Settlement.
- Rasad*—Supplies.
- Rasad kharcha* (*Cuttack*)—A payment at one piece per rupee to meet the expenditure incurred in finding supplies (*rasad*) for any high official touring in the neighbourhood.
- Rasadi*—Progressive assessment of revenue or rent to mitigate the hardship of sudden enhancement.
- Rekti matal*—A stiff rich soil.
- Reportdars*—Elected representatives of a *Sasan* or *Tanki* village through whom the revenues are paid.
- Rokar* or *Jamakhirach*—Ledger.
- Ruidads*—Completion reports of the former settlements.
- Rusum* or *Russoom*—Deductions of five per cent. from the gross collections of village under the charge of a *talukdar*.
- Sadabrati* or "*Pious Endowments*"—Is the generic name for all charitable endowments. They appear to be generally recorded as *khairat* or *debottar*.
- Sadar*—An abstract.
- Sag*—Spinach.
- Sagbari*—A portion of the homestead set apart for growing *Sag*.
- Sairat* or *Dafait jama*—Miscellaneous rent other than that collected for the use of the land.
- Sair Wasi Wai*—Extra collections in the form of octroi, market dues, etc.
- Sanad*—Deeds by which grants of lands were made by Hindu, Muhammadan or Mahratta Rulers, also certificats granted by the British Government to Tributary Chiefs and proprietors of peshkas' estates describing their status, etc., etc.
- Sani*—Subsequent.
- Sanja*—Means a contract, and is used of a rent in kind fixed at a certain quantity, which is payable whatever the outturn may be.
- Santak*—A caste mark which is affixed by the illiterate to documents in place of signature.
- Sarad*—(*Oryza sativa*)—Winter rice sown in June-July and reaped in November-January.
- Sarai*—Lodging-house for travellers and suitors in the courts.
- Sarbarahkar*—Originally a farmer of the revenue, who has now in many cases become a proprietary tenure-holder.
- Sarba Sadharan* (lands)—Waste-lands and tanks to the use of which the villagers have a customary right.
- Sarisa* or *Sayam*—(*Brassica campestris*, *brassica juncea*)—Mustard.
- Saru*—(*Colocaria antiquorum*, *caladium*)—A kind of vegetable.
- Sasan*—A Brahman settlement, &c.
- Sawai* or *Panchpai*—An agricultural loan of grain for food and seed to be repaid at harvest time with interest at 25 per cent.
- Seba*—Service or worship
- Seer*—Weight of 80 tolas=four paos = 2.0532 lbs. Avoirdupois.
- Sewai* or Extras—Is the expression sometimes used to cover all the excess collections in the Puri district but in some cases it denotes the addition taken to cover interest on arrears of rent ; arrears are often charged at 25 per cent.
- Sebait*—Minister or worshipper.
- Sherista*—An office where records are kept.
- Silha*—Daily cash-book.
- Sidha* (rice).—Rice prepared from paddy by boiling it, and then drying it in the sun and then crushing it in the *dhenki*.
- Sir* (land)—Proprietor's private land.
- Sirkar*—Is a part of the paraganas which were grouped into three parts (*Cuttack*, *Bhadrak*, and *Jaleswar*) by Raja Mansingh.

- Soem* or *Sayam*—Third-class (inferior and sandy) soils.
- Subah*—Province.
- Sudh matal*—Purely muddy soil.
- Sukwa*—Dried fish.
- Sunia*, *Salami* or *Bheti*—A form of *abwab*.
- Sunn*—(*Crotolaria juncea*)—A kind of fibre.
- Supari*—(*Areca catechu*)—Betel-nut.
- Tahasilatalkids*—The *tahasilatalkida* lands of a village are the lands of estates which, at the time of the last settlement, did not form part of the estate to which the village originally belonged.
- Tahasilkharcha* or *Fahari* (Cuttack)—A fee varying from half-an-anna to two annas in the rupee of rent levied annually for the maintenance of a collection staff.
- Taluk*—An Arabic word that may be translated 'sphere of influence'. Sometimes also called *Tappa*.
- Tamasuk*—Bond.
- Tunki* (rent)—A quit rent.
- Tankibahal*—These are tenures which were assessed at the last-settlement with quit rents fixed in perpetuity. In Khurda the rates, but not the rents, are fixed in perpetuity.
- Tarmuj*—(*Citrus vulgaris*)—Melon.
- Tari*—Juice of the palm tree.
- Tarnim*—Corection.
- Tasfir*—Lands held in excess of an original *lakhiraj bahal* or *jagir bahal* grant which have been assessed to rent.
- Til indicum* (*sesamum*)—Is a kind of oil-seed.
- Tisi* or *Pisi*—(*Linum usitatissimum*)—Linseed.
- Tola*—Fees in kind or cash for the shops of a market.
- Tola*—Is the weight of one standard rupee=180 grains Troy.
- Tolan* or *Sahi*—Hamlet.
- Thanawar*—*Thana* by *thana*.
- Thani*—Raiyats resident in the village whose rents were fixed for the term of the last settlement.
- Thani-pahi*—(See *karpahi*).
- Thani Kharcha* (Cuttack)—A fee paid by a *thani* raiyat to retain the services of the *Gomasta* and *Amin* for the purpose of re-measuring his holding or laying down the boundary. It usually amounted to two or three annas per holding.
- Tinsa*—The outer husk of the paddy which is removed during the preparation of rice.
- Turiya bharangiya*—Trumpeters.
- Uparpahi*—*Karpahi* lands tenanted by a resident of another village.
- Usna*—Same as *sidha* rice.
- Urbati*—A tenancy from year to year or from season to season.
- Vilayati* or *Wilaiti*—(Vide *Amlī*)
- Warija*—The old name for the *khatian*.
- Zamindars* or *Malguzars*—Proprietors directly responsible to the State for the revenue of the land they own.
- Zamindar-dia-jagir*—Grants of service lands made to retainers, servants, and others by *Zamindars*.
- Zamindars-dia-minha*—Plots of land, mostly homestead, allowed by zamindars to a raiyat without payment of rent, and generally forming part of an occupancy holding.
- Zamindar-dia-niskar* or *kamjama*—These were grants, rent-free, or at a nominal rent, made to Brahmins or old servants, and by the custom of the country generally tenable more or less at the pleasure of the donor.

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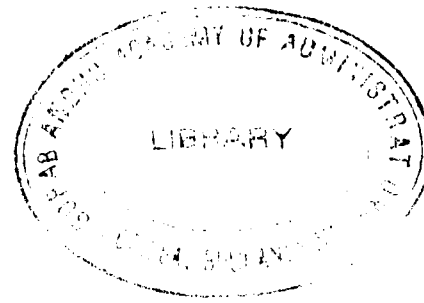
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1890 to 1900 A. D.

CHAPTER 1.

1. The jurisdiction of the Commissioner of Orissa and Superintendent of the Tributary Mahals comprises :—

The Tributary States pay a quit-rent fixed in perpetuity, while in the three districts, the temporarily settled area amounts to about 6,000 square miles, of which 2,300 are situated in Cuttack, 2000 in Puri and 1,700 in Balasore. Out of this area (6,000 square miles) the Khurda Government Estate comprises about 1,000 square miles. The resettlement of this Estate was completed last year by the Settlement Officer of Orissa and his assistants, and has formed the subject of a separate report already submitted to the higher authorities. It is only necessary to say here that the work was done under the immediate supervision of Mr. James Taylor, Assistant Settlement Officer, and that rents for some two hundred thousand tenants were raised from Rs. 3,09,000 to Rs. 3,77,000, the actual annual gain of revenue to Government being Rs. 55,000 and the cost of the operations, Rs. 1,92,000.

2. The area dealt with by the Survey Department in Orissa is returned as follows :—

With the exception of the 32-inch work nearly the whole of the survey was original, the areas under canal irrigation and the Khurda Government Estate having been surveyed on the 32 inch scale some fifteen to twenty years ago.

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3. In this report I have only dealt with the temporarily-settled area of 5,000 square miles (excluding the Khurda Government Estate). In this area rents have been settled for some fifteen hundred thousand tenants, and the Government revenue of nearly six-and-a-half thousand estates has been raised from nearly fourteen lakhs of rupees to more than twenty-one-lakhs. The operations lasted from the end of 1889 to the end of 1899; and in addition to the work in the temporarily-settled areas the Settlement Department was entrusted with settlement work in the large Ekhrayat and Satais Hazari Estates belonging to the Puri Temple; with several minor operations in Khurda; with the record of rights in portions of *Killa Darpana* and *Killa Aul* (both permanently settled); and with the record-of-rights and settlement of rents in *Killa Madhupur*, a permanently-settled estate under the Court of Wards.

4. The report is divided into seven parts :—

Divisions of the report.

Part I.—Statistical.—Chapters II, III, and IV contain brief statistical accounts of the temporarily-settled areas in Cuttack, Balasore and Puri (excluding Khurda, already dealt with in a separate Settlement Report). These chapters serve to bring up to date the information given by Sir W.W. Hunter in his Statistical Account of Orissa.

Part-II.-Economical.—In this part, economical matters, other than the relations between landlord and tenants (relegated to Part-III) are dealt with. Chapter V contains an account of the Irrigation and Protection works in Orissa and of the enquiry made regarding the proposal to introduce an owner's rate. The information regarding Embankments may be supplimented by the History of Embankments in Orissa lately written by Mr. W. A. Inglis, Superintending Engineer. In Chapter VI an attempt has been made to supplement the information on agriculture given by Mr. N. N. Banerjee and Mr M.H. Arnott. Chapter VII gives a history of prices and chiefly deals with the prices of common rice. In Chapter VIII the material condition of the people is described, and an account is given of the wealth of the Province and of the famines which have at times overwhelmed it.

Part III.—History and Land Tenures.—In Chapter IX a brief account is given of ancient Orissa, its history and its religion, so far as may be gathered from the writings of certain well known authorities. Chapter X contains history of the early Revenue Settlements; while in Chapter XI the history of the Land Tenures is brought down to the present day. In Chapters XII and XIII the relations between landlord and tenant, and the laws which govern these relations, are dealt with.

Part IV.—Procedure.—In this part an account is given of the procedure adopted in different stages of work. So far as possible, the results of the work have been relegated to the next Part (Part V). These chapters have been written, at considerable length for the benefit of the Settlement Officers of 1927. Great difficulty was experienced in discovering the procedure at the last Settlement, as details were not set forth in any one place, and a search in Record rooms, in manuscripts, and even in printed papers involved a considerable expenditure of time. For this reason, the chapters on procedure have been written very elaborately (see also Appendix A).

In Chapter XIV a general account of the procedure is given, together with some references to the officers employed on the work. Chapter XV, XVI, XVII, XVIII, XIX and XX follow the regular sequence of the procedure from the stage of demarcation and survey through the stages of *khanapuri*, attestation, settlement of rents and settlement of revenue, up to the last stage of arrangement of the final record and its maintenance.

In Part V there are two Chapters—XXI and XXII—describing the results of the work, so far as areas and so far as rents and revenue are concerned.

In part VI there are also two Chapters. Some account of the permanently settled estates, Tributary States, and the *Killas* eligible for specially lenient treatment is given in Chapter XXIII; and Chapter XXIV contains an account of the revenue-free areas, almost inextricably intermingled with the temporarily settled revenue paying area under report.

Part VII of one Chapter (XXV) containing a brief account of the cost of the operations.

5. The Appendices contain the following information :
Appendices.

Appendix A gives a reprint of important correspondence; in Appendix B are the rules under section 189, Bengal Tenancy Act, and the rules prescribed for record writing and attestation. The rules for settlement of rents and assessment of revenue are contained in Appendix C. Appendix D contains certain forms illustrating village areas. In Appendices E and F the *Milan Khasra* (statement showing the areas of villages under heads 'Cultivated', 'Culturable', etc.) and the crop statements are compiled. Appendix G contains a reprint of the note on the embankments classified by Mr. C W. Odling. Appendices H to M show lists of roads, bungalows ferries, grazing grounds and public lands. Appendix N contains a list of prices of commodities sold at the Bhadrak hat and Appendix O gives an account of a raiyat's annual expenditure. In Appendix P there is a statement showing how rents have been altered. Appendices A.A to E.C give figures for rents and incidences and F.A to F.C for revenues. Appendices G.A. refer to tenure-holders (proprietary) K.A and K.B. give figures for rents payable to under-tenants. L.A. to L.C. show revenue for areas; M.A. to N.C. give an account of the zamindars in the Province. In O.A. and P.A. Mr. Carey's notes on the *Amli* year and Kists are reprinted. At the end of the Appendices will be found the reports by Messrs D. H. Kingsford and H. McPherson on the settlements of Balasore and Puri. Mr. James Taylor's Report on Khurda has been published separately and separately dealt with.

6. I cannot conclude this introductory preface without an expression of my deep sense of gratitude and obligation to Mr. J.E. Webster. With the exception of the introductory chapters and the chapters containing reviews of general results, he has either written or drafted a very large portion of the report. He is thus largely responsible for its form, matter and manner. Mr. Webster possesses the most complete knowledge of the literature of the old Settlements, as well as of all the details of the Bengal Settlement laws. My gratitude to the other convened officers (Messrs H. McPherson, Carey and Kingsford) who have worked with me has been expressed in the Introductory Chapter to Part IV. In that Chapter the names of other Assistant settlement Officers have also been recorded, and I would only mention here the name of Mr. James Taylor as responsible for carrying out the Khurda Settlement. In addition to the work of inspection and organisation done by the above officers, I would ask permission to draw attention to the very able reports written by Mr. H. McPherson on Puri, Mr. Kingsford on Balasore, and Mr. James Taylor on Khurda. A record is also made in Part IV of the very valuable work done by Messrs Maude, Walsh, and Nathan during the first six years of the Settlement operations. On account of ill-health they were unable to complete their work, and it was thus left to others to reap the fruits of their labours. Extracts have been made (not always with due acknowledgements for the great assistance they have given us) from the historical works of Stirling, Toynbee, and Hunter and from the orders and reports of Directors of the Department of Land Records—Messrs, Finucane, McPherson and Lyon. I beg leave to express here my very great obligations to all these authorities.

CHAPTER II.

PHYSICAL AND STATISTICAL ACCOUNTS OF THE CUTTACK DISTRICT.

7. **Cuttack, or Katak**, the central of the three districts of Orissa, is bounded on the north by Balasore, on the south by Puri, on the west by the Tributary states of Keonjhar, Dhenkanal and Athagara, and, on the east by the Bay of Bengal. The boundary between Balasore and Cuttack is the river Baitarani* which, issuing from the Keonjhar hills, flows in to the Dhamra estuary.

Situation and Boundaries.

Between Puri and Cuttack there is no natural boundary; it has been proposed to make the right banks of the Mahanadi river and of its branches, the Kathjuri, and, lower down, the Deb, the dividing line, thus transferring to Puri about 327 square miles comprising the whole of *Killas Banki*, Patia and Domapara, and of pargannas Sauri, Bahurupa, and portions of pargannas Bakhrabad, Sujanagar, Kodinda, Saibiri, Sailo, Deogaon, Kate, and Benahar. The transfer would have the effect of equalising the size of the two districts, but, if we expect *Killas Domapara* and *Banki*, which might be attached to the sub-division of Khurda, the remaining area is more readily accessible from Cuttack than from Puri.

8. The number of villages or "Mauzas" in the district is, according to the census of 1881, 12, 841, and according to the census of 1891, only 5,429. In the present Settlement the number was found to be 6,347 viz—

Village.

Thana		
Tirtol	....	817
Kendrapara	....	665
Patamundai	....	394
Aul	....	553
Dharmasala	....	1,306
Cuttack	....	416
Salepur	....	699
Jajpur	....	703
Jagatsingpur	....	794
Total		6,347

Out of these, 4,665 are dealt with in this report. They have an average area of 300 acres each.

Population.

9. In 1872 the population was returned at 14,94,784, in 1881 at 17,38,165, and in 1891 at 19,37,671 persons.

That is to say in the first ten years it increased by more than 16 percent, and in the next decade by nearly 12 percent. Assuming, then, an increase of 1 percent per annum as a safe amount, we get the present population as nearly 21,00,000 of which, taking the proportion of males and females, viz., 95 to 100, found at the last census to still subsist, the number of males is about 10,25,000 and of females, 10,75,000.

The average number of persons to the square mile is 573; and population is densest in Salepur, Jagatsingpur and Jajpur thanas, and least so in Aul, Dharmasala and Tirtol.

Roughly, we may take the distribution by religions to be :—

Hindus, 97.1 percent	....	20,39,000
Mahomedans 2.7 percent	....	57,000
Christians 14 percent	....	3,000
Others	..	1,000

Area.

10. The total area of Cuttack District is 3,663 square miles, of which 752 square miles, contained in Kujang, Kanika and Banki, have already been dealt with in previous Settlement Reports. For another 717 square miles in the permanently settled estate of Sukinda, Darpan, Kalkala, Patia, Domapara, Haripur and Bishnupur, details of the cultivated and uncultivated area are not available. For the remaining 2,194 square miles comprising all the temporarily settled estates, besides parganna Derabisi (of *Killa Aul Killa*

* See Notification No. 2395 of the 18th May 1896 which transferred several villages from Cuttack to Balasore and vice versa,

Madhupur, *Killa* Chhedra and the revenue free and permanently-settled lands within the temporarily settled parganas, the following figures have been compiled * :—

	Acres
Total area	14,03,600
Cultivated (including homestead lands)	9,75,600 or 70 Percent.
Culturable	68,300 or 5 Percent.
Unculturable	3,59,700 or 25 Percent.

Map No. VI shows the extent to which the several parganas are cultivated. As might be expected, it is generally along the western border, where there are large areas still under jungle, that the percentage is lowest. In a few also of the central parganas, such as Karimul and Cuttack Haveli, the large area covered by the bed of the Mahanadi keeps down the proportion of cultivated land.

Details of the culturable are as follows :—

Culturable lands.

	Acres	Acres
New fallow	31,300	Thatching grass 1,900
Old fallow	24,400	Culturable jungle 10,700

Nearly a quarter of the new fallow lies in Cuttack thana and consists mostly of high lands capable of growing crops in favourable seasons only; and the next largest area is in Jajpur, where it is to a great extent now cultivated with *dalua* or spring rice (see paragraph 11).

The old fallow may or may not be culturable at present, but if some of it is not, there are probably portions of the so-called unculturable waste that may eventually be reclaimed. Nearly a third of it is in Jajpur Thana, where it is low-lying and heavily inundated and somewhat saline, but affords grazing to large herds of cattle throughout the cold and hot weather. The thatching grass forms a valuable property, and is chiefly found in parganas Bakhrabad and Tapankhand, and in Madhupur and the neighbouring *Killajat* estates. The culturable jungle consists chiefly of low scrub at the foot of the Bakhrabad, Dalijora and Sukinda hills and it is very doubtful if much of it will come under the plough during the next thirty years, but it might be used for orchards or plantations.

From this 68,300 acres of culturable land we have, however, to deduct at least half the area reserved for grazing and other purposes.

Altogether the reserved lands consist of :—

	Acres
Grazing lands	48,808
Grazing grounds	6,180
Cremation grounds	341
Tanks, &c.	...

The last two are generally unculturable, but taking half the grazing[†] ground to be culturable we have only 43,900 acres left to be brought under the plough, and it is to be hoped in the interests of the cattle that most of this land may be spared to them.

The unculturable lands are made up as follows :—

	Acres
Houses	10,300
Tanks and rivers	1,00,700
Canals	5,000
Embankments	6,500
Jheels	5,300
Government roads	4,050
Other roads	9,600
Burning ghats	3,450
Waste, &c.	2,14,800

11. Rice † is by far the most important crop, and is grown in three distinct ways as—*sarad* or winter rice sown in June-July and reaped in November-January; *biali* or autumn rice sown in May-June and harvested in August and September, and *dalua* or spring rice sown in November-December and harvested in March. Map No. VI will show

* See Appendix E.

† See Paragraph 130

at a glance the proportion under rice-*sarad* and *biali* combined - in different parts of the district, and further details will be found in Appendix F.

After rice, the most important cereal is *mandia*¹, a millet grown both as an autumn² and as a spring³ crop. Wheat and barley are cultivated but to a very small extent. *China*⁴ is more largely grown but is not of much importance, and after rice it is on the pulses sown in the autumn and harvested from January to April that the people mostly depend.

Of these the commonest is *kulthi*⁵ grown on very inferior lands (often after *mandua*), and *birhi*⁶ a small plant somewhat resembling *Kulthi* in its habit but producing quite a different grain. The *Kulthi* seed is a dark, flat and pointed bean which makes an excellent food for cattle and horses and is boiled and eaten with rice by the poorer classes and even taken alone in time of scarcity. *Birhi* produces a little round reddish pea largely used as *dal*; it is a more valuable plant and generally follows *biali* rice. *Muga* or *mung*⁷ is one of the most valuable pulses and resembles *birhi*, except that it is usually grown on *sarad* lands. It is chiefly found in the flooded tracts.

On riverside lands *harar*⁸ is sown and gives a valuable crop, though it is said to be too indigestible to be taken alone as food.

Oil seeds, *viz*, linseed *til* and mustard are raised on silt-covered lands after a crop of rice, and the castor seed is sown for choice in a mixture of sand and silt, as it will grow in a depth of sand that would kill almost any other crop.

Sugarcane is grown on irrigable fields, and so are to some extent jute and cotton; dyes are of small importance, though there is an indigo factory at Kenduapatna; but condiments and spices are very generally grown in garden lands, especially coriander and turmeric.

Tobacco is an important and valuable crop, being grown every-where on silt-covered lands, but more especially along the lower basin of the Katjuri in parganas Deogaon, Kate and Saibir.

*Pan*⁹, though covering but a small area, is very valuable. It is not grown every where but is found chiefly in Kodinda, in Kate, in Sungra, and in Tisania.

Among vegetable the *saru*¹⁰ and the brinjal, pumpkins of many kinds, and onions, are the most important. Potatoes have been introduced, but are not yet widely known. Arrowroot is said to be grown by Native Christians only.

Among fruits, plantains are found in most villages and mangoes grow freely and from a valuable food during the hot weather, though very inferior in taste to those of Bombay or Malda; pineapples are also common throughout the district. Other fruits are the bael, jack, tamarind, Indian plum and custardapple.

In round figures the areas under the several crops, (excluding Kanika, Kujang, Banki, and 717 square miles not under Settlement) are as follows¹¹ :—

Winter rice— 6,85,000 acres or 70 percent of the nett cropped area, grown in every part of the district.

Autumn Rice— 1,28,000 acres or 13 percent of the nett cropped area. The distribution of the *Winter* and *autumn* rice is shown in map No. VI.

Spring Rice— 17,000 acres or 2 percent, chiefly in the low lands near the estuaries of the Kharsua and Brahmani rivers.

Mandua — 29,000 acres or 3 percent, chiefly in central Cuttack.

Other Cereals— 1,000 acres.

Pulses and other food grains— 1,63,000 acres or 17 percent. Found everywhere, but most general on high river side lands.

Castor—1,000 acres. Most common in the country between the Brahmani and Kharsua.

Other oil seeds—8,000 acres. Chiefly in Deogaon and Saibir and the valley of the Katjuri; also along the lower reaches of the Chitratola and Nuna rivers.

Tibres— 2,500 acres, of which two-thirds is cotton. Chiefly in the irrigated tracts.

1. Eleusine coracana.
2. Bhadai.
3. Rabi.
4. Paricum miliaceum.

5. Dolichus biflorus.
6. Phaseolus radiatus.
7. Phaseolus mungo.
8. Cajanus indicus.

9. Betel.
10. A variety of Arum.
11. See Appendix F.

Tobacco—3,200 acres. Of this nearly 2,000 in Jagatsingpur Thana alone.

Pan and other Drugs— 200 acres. Chiefly in Salepur, Jagatsingpur and Cuttack thanas.

Yamas, Brinjals and other vegetables—2,000 acres, besides what is included in the 52,000 acres of homestead land.

Garden Produce and Fruit Trees— 21,000 acres.

The figures given in the last two paragraphs refer only to the 2,194 square miles shown in the *Milan Khasras*.

In Banki, Kanika, and Kujang the cultivated area is 317 Square miles and we may take the Cultivated Area of the remainder at one half of 717 square miles, thus making the total area of the district under cultivation 2,200 square miles.

12. Numerous as they are, the rivers are not now very largely used as waterways. From Sambalpur to Cuttack boats come down the Mahanadi, and there

Communications.

(a) By water.

is some little traffic on the upper waters of the Brahmani, but on the whole the rivers are, except in the tidal reaches, too shallow and too uncertain to be very much used.

The bulk of the heavy passenger traffic between Cuttack and the neighbouring districts was carried by road and canal; I say "was" for a new route, the East Coast Railway, was opened in 1899.

The Kendrapara and Gobri Extension Canals connect Cuttack with the Brahmani at Alba, and from there boats go down the river to Chandbali, where cargo is transhipped and carried by steamer to Calcutta.

The Taldanda Canal between the Mahanadi and Katjuri rivers connects Cuttack with False Point, from which rice is shipped chiefly to the Mauritius. The High Level Canal supplies a direct route between the marts of Cuttack and Bhadrak.

There has been some talk of making the Machgaon Canal available for navigation and of extending it to Machgaon so as to obtain a third route to the sea *via* the Deb river, but it is doubtful whether the Deb would prove fit for the entry of any but very small boats, and there is no reasonable prospect of the scheme being carried into execution. I do not myself consider that there is now much need for further extension of the canal system, the district being already remarkably well served.

13. Roads * of three classes are maintained :—

Communications.

(b) Roads.

(1) *Provincial Roads*, paid for out of provincial funds and in charge of the Public Works Department.

(2) *District Board Roads* paid for from the District Road fund and in the immediate charge of the District Engineer. Total length 464 miles, of which 25 are metalled.

(3) *Local Board Roads*— Roads of purely local utility paid for out of the District Road Fund but in charge of Local Boards.

First among the Provincial Roads ranks the Grand Trunk, the highway from Midnapore in Bengal to Ganjam in the Madras Presidency. It enters the District at Akhoyapada, 46 miles from Cuttack. It is raised and metalled, and crosses the Baitarni, Kharsua, Brahmani, and Mahanadi rivers by ferries, and is provided with bungalows at Akhoyapada, Khandetar, Dharmasala, Barchana, Tanghi, and Cuttack.

Skirting the western hills it reaches Cuttack town, where it divides into two, the Cuttack to Puri road and the Cuttack to Ganjam road, the former being generally known as the Jagannath Road †. This road was constructed between 1811 and 1819 in place of the old Pilgrim Road, of which traces are yet visible in ruined but massive bridges in the Hindu style of architecture standing in solitude over streams where there is neither road nor traffic.

There are 2 other Provincial Roads; the first, from Cuttack to Sonapur, is mostly unmetalled. It lies up the valley of the Mahanadi and along the right bank through Banki. The other, from Cuttack to Sambalpur, is a new road through Atgarh up the left-hand valley of the Mahanadi.

The principal District Board roads leading to Cuttack are :—

* See Appendix H

† See Toynbee's History page 82, Paragraph 42 below.

(1) *Cuttack to Taldanda*—44 miles along the south of the Mahanadi 13½ miles metalled with laterite; a fair road all the year round.

(2) *Cuttack to Machgaon*—Leaves the last road at the 11th mile, and runs 32 miles to Machgaon on the Deb river. Metalled to 14th mile from Cuttack. Carries a heavy grain and salt traffic.

(3) *Cuttack to Chandbali*—63 miles, of which two are metalled. Crosses the Mahanadi at Cuttack and the Brahmani at Patamundai on the 50th mile. Passes by Salepur, Kendrapara, Aul and Patamundai Thanas.

(4) *Fulnakhera—Madhab road*. From 10th mile of Puri road along the border of the district to Madhab, 25 miles, and so on to Puri. A fair road to the 15th mile.

The above are the chief roads by which the produce of the country is brought to Cuttack; the principal cross and feeder roads are the following :—

(5) *Tangi to Haripur*—Connects the Garhjats with Tangi on the Grand Trunk road; 10th mile.

(6) *Jajpur to Kuakhia*—9 miles from Jajpur, through Beruan to Kuakhia, at the 30th mile of the Grand Trunk road. A fair road with two ferries.

(7) *Jajpur to Kendrapara*—25 miles; Kharsua and Brahmani unbridged. A very bad road in parts, and impassable in high floods.

(8) *Beruan to Kalamatia* - 16 miles, joining the last two roads. A bad road in the rains.

(9) *Jajpur to Pachikot* -19 miles to Ragri in the extreme north-west. A fairly good road partly bridged.

(10) *Jajpur to Kyanti* -17 miles in a south-easterly direction. A fair-weather road, *Bengu nala* being unfordable when high.

(11) *Beruan to Balichandrapur* -14 miles through the hills of Alti; four unbridged rivers to cross.

(12) *Salepur to Chatia* - From Salepur on the Kendrapara road at Chatia on the Grand Trunk road; 18 miles with two rivers to cross. Is almost impracticable for carts in the rains.

(13) *Patamundai to Sudipur* - 11 miles. A good road; unmetalled.

(14) *Jagatsingpur to Jaipur* -8 miles, joining the Taldanda and Machgaon roads.

(15) *Jagatsingpur to Tirtol* -9 miles, joining the Taldanda and Machgaon roads.

This is by no means a complete list, but the above are the principal roads under the District Board; and the accompanying map will give a fair idea of the road system of the district. On the whole it is very well supplied, and there has been a very great advance since the time of the last Settlement. There are, however, still many villages accessible only to pack bullocks, and many only by boats in the rainy season.

In the east parganas Benahar and Khandi are poorly supplied, so is the strip of country between the Taldanda and Kendrapara canals. Generally, however, the District Board appear to have done their best, and if there are large areas very difficult of access, the nature of the country, intersected as it is by rivers, sufficiently accounts for this.

Village roads, however, leading to the district roads are very badly kept, and a great improvement would be effected if the villagers would combine to keep in repair fair weather paths to their houses and fields.

14. The District is very well supplied with staging and inspection bungalows. There are bungalows at every stage (about 10 miles) along all the provincial roads - the Cuttack-Chandbali road, the Fulnakhera-Madhab road, the Taldanda road, and the Machgaon road; also along all the canals, and at Beruan and other central positions.

A list of these bungalows is given in Appendix I.

15. The year 1899 saw the opening of the Bengal-Nagpur Railway line, which, when complete, will connect Cuttack directly with Madras and Calcutta. Within the District there will be stations at Cuttack, Tangi (Kapilas Road), Jenapur, and Jajpur Road.

What its ultimate effect on the prosperity of the country may be it is impossible to say. Already the demand for labour created by it has sent up wages, and it is unlikely that they will ever again fall to quite their former level.

It is doubtful whether it can hope to compete successfully with steamers in the rice export traffic unless branch feeder lines are extended in to the rice-growing districts, towards Taldanda to the east and Sambalpur to the west. The stations on the main line are so placed that they may receive all the grain now brought in to Cuttack town and all that is brought down from the Tributary States, but it is by no means certain that they will get the river-carried rice from Sambalpur, and it is highly improbable that the railway can seriously interfere with the Chandbali or False Point trade.

16. There are only three towns of any importance in the District.

Towns. Cuttack.	Cuttack, the present capital of the District, first sprang in to importance in the tenth century, when the protecting dykes were built and the fort constructed by the Hindu king <i>Makar Kesari</i>. It was the head-quarters of both the Mogul and Mahratta administration, and for many years after its first occupation by the British gave its name to the whole Province.
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It contains, besides the district Offices, the offices of the Commissioner of the Division and of the Superintending Engineer in charge of the canals and embankments of the province. In the old fort, a wing of a Madras regiment is still stationed.

It had a population, according to the last census, of 47,186, and now probably holds little less than 60,000 souls. It stands at the apex of the delta formed by the Mahanadi and Katjuri rivers, and is protected from inundation by embankments solidly revetted with stone.

The Grand Trunk road and the new railway line pass through, and almost all the principal roads of the District converge on, it, and it has a large and steadily increasing trade.

It is curiously devoid of fine public buildings. The little English Church, the Collector's offices, and the Lallbagh House are all handsome buildings in their way, and standing on the river banks present a fine view to the approaching visitor's eye; but there is not a single ancient temple of interest, and but for the old fort gate and moat and the river revetment there is hardly any sign of the town's antiquity.

Jajpur	Jajpur, the ancient capital of Orissa, and now the head-quarters of the sub-division of that name stands on the right bank of the Baitarni. The population, according to the last Census was 11,992. The chief importance of the town is as a resort of pilgrims, there being comparatively little trade. It contains many interesting buildings, among which the most striking are the temples of <i>Biroda Devi</i>, of the <i>Boar</i> * incarnation of <i>Vishnu</i>, and the great sun pillar that stands a mile outside the town. This latter consists of a huge and beautifully proportioned column of stone raised on a solid pedestal, and if the temple was in proportion, it must have been of remarkable size. All traces of it have, however, disappeared, and the column has only escaped owing to its great weight, which prevented its would-be destroyers from moving it. Tradition says that the stone was brought from the hills of Alti; but how such a heavy mass was carried across rivers and fields remains a puzzle to the cleverest engineers.
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Besides these there are some ancient heroic figures of Gods and Goddesses standing and lying in the compound of the subdivisinal office. They are considered to be very fine specimens of Hindu art, but all bear traces of Mahomedan vandalism in their mutilated features, from which the noses were cut by the renegade Kalapahar. Indeed, the idol of *Biroda* is said to be the only one who escaped the fury of that iconoclast, she having taken refuge in the belly of a crocodile until the danger had passed. Interesting, too, are the grim features of the seven mothers of the earth in a dark little gallery by the river bank; but there is little beauty in any of these early works, and it is rather the crudeness and grotesqueness of the sculpture that attract. The Mahomedan mosque built by Nawab Abu Nasir in the seventeenth century is an elegant building and has lately been restored by the Public Works Department.

Kendrapara.	Kendrapara, the head-quarters of the other sub-division and the second town of importance in the District, was also a place of considerable sanctity. It had a population, at the
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* Boraho. For an account of this see pages 268, Vol.—I of Hunter's Orissa.

last census, of 17,647 persons, and its position on the Kendrapara Canal and in the centre of rich grain-producing country gives it a considerable trade. It is connected by road with Cuttack, Jajpur, and Chandbali, and is the residence of many well-to-do persons. Besides the sub-divisional buildings, it has a good school and dispensary, and a public library has lately been opened for the supply of English and vernacular literature.

17. In spite of the extent of sea face and the many estuaries by which its rivers flow in to the Bay of Bengal, the District does not contain a single harbour capable of sheltering ships of any size. As late as 1866, the export trade was carried on from False Point at the mouth of the Mahanadi, where ships have to anchor in a comparatively exposed roadway, and loading and unloading can only be done in fair weather. At present there is still a considerable export of rice, chiefly in sailing ships from False Point to the Mauritius, but most of the trade passes through Chandbali in the Balasore District at the mouth of the Baitarni. There is a deep channel up the Devi river as far as Machgaon, but, like all the other estuaries, this too has a bar of sand across the mouth that prevents the entrance of vessels of any size except at high tide.

18. Cuttack imports large quantities of Kerosine oil, salt, cotton twist and piece-goods, spices, gunny bags, sugar and other miscellaneous articles. The total value it is very difficult to estimate, as the returns for Chandbali port do not differentiate between the imports for Balasore and those for the Cuttack District.

Allowing that two-thirds of the trade of Chandbali is on account of Cuttack, the total value of the imports in to Cuttack was about Rs. 50,00,000 in 1897-98.

The principal exports are rice and hides, making up, with brass ware, timber, and stonewares, and grains of various sorts, a total value of about Rs. 60,00,000/-.

There are no manufactures of great importance. Salt, which was manufactured to the value of about 4 lakhs annually, has been discontinued; country cloth is woven in many villages and is largely used by the people, but is not exported. The brass work is said to be good its kind, and some is exported both in the form of household utensils and in the shape of small bells and figures used in Hindu worship.

Blankets are made in some villages of Tapankhand, and silk is spun in places along the foot of the hills. Cuttack silver filigree work is speciality, but the manufacture is confined to but a few persons.

19. For administrative purposes the District is divided in to three sub-divisions; (1) the Sadar or Cuttack Sub-division, (2) the Kendrapara Sub-division, (3) the Jajpur Sub-division. Each of the last two is under a Deputy Collector, who is immediately subordinate to the Magistrate and Collector of the District. The sub divisions are for Police purposes divided in to *thanas* viz :-

Sadar Sub-division.....	{	1. - Cuttack	Thana
		2. - Banki	"
		3. - Jagatsingpur	"
		4. - Tirtol	"
Kendrapara Sub-division.....	{	1. - Kendrapara	"
		2. - Patamundai	"
		3. - Aul	"
Jajpur Sub-division....	{	1. - Jajpur	"
		2. - Dharmasala	"

For revenue purposes the District is divided in to 77 parganas, besides the permanently-settled estates of Aul, Kanika, Kujang, Kalkala, Darpan, Sukinda, Harispur, Marichpur, Dompara, Patia and the Khas Mahal of Banki.

The ultimate unit of division is the estate, of which there are 4,465, besides about 73,000 revenue free estates.

The revenue-paying estates may be classified as follows :-

Class.	Number.	Area in Sq.miles.	Revenue. Rs.
Permanently-settled	11*	1,835.1 †	79,700
Temporarily-settled with revenue of over Rs. 10,000	5	150.2	1,09,600
Revenue of-			
Rs. 1,000 to Rs. 10,000	208	897.8	5,20,900
Rs. 100 to Rs. 1,000	1,204	603.1	3,82,500
Rs. 50 to Rs. 100	594	68	42,700
Rs. 10 to Rs. 50	1,457	55.8	37,500
Rs. 10 and under	981	7.9	5,200
<i>Killajat</i>	3	49.7	Not yet settled. ‡
<i>Tanki Bahal Estates</i>	2	0.3	22
Total	4,465	3,667.9	11,78,122

The whole of this land revenue will not become due for ten years, owing to the *rasadi* terms allowed in the case of large increments.

20. The surface § of the District falls according to its natural features in to three main divisions.

Physical Divisions.

To the west a strip of high sterile land and rocky hills covered with thorny bamboo or scrub jungle and intersected by narrow valleys. The greater part of this region is occupied by the permanently-settled estates of Sukinda, Darpan, Kalkala, Patia, and the *Killajat* estates of Balarampur, Ragri, Chausatipara and Kantajhar, once the strongholds of almost independent border chieftains and still known as *killas* or forts. Dalijora and Bakhrabad are the only temporarily-settled parganas having any considerable area within this zone. Shergarah, though even more westerly, is a high, dry plateau, in no way resembling the neighbouring *killas*. East of this region lie the wide alluvial plains forming the delta of the Mahanadi, Brahmini, and Baitarni rivers. They have a gradual but steady slope from the high lands of the west to the sea, and a composition varying greatly according to the relative proportion of the sand and silt of which they are formed.

The surface is generally level, but is broken by the hills of Alti and Matkatnagar in the centre, and is cut up by numerous river channels.

It is fairly wooded, especially in the centre portion; mango, banyan, and pipal trees being common and cocoanut, toddy, and date palms found in most well-to-do villages. The banyan trees particular are very fine; one at Kuhunda in Jajpur under which a cattle fair is held, covering about an acre.

East again from this area are the low lands of the sea coast, treeless expanses of rice land and grass, full of swamps and saline creeks, sloping down in to penetrable morasses, the haunt of wild hog and deer; and enormous crocodiles. Almost the whole of this third division is contained in the permanently-settled estates of Kujang, Kanika, Aul, Harispur and Bishnupur, though the parganas of Bara, Kaima, Bautara, Hatimunda and Utikan, belong rather to this than to the central division.

For an account of the geological formation of the District, I would refer to Messrs. Blandfords' report on the portion of the Cuttack District examined by them in 1855-56, from which I here quote the following :—

“From the plain, small isolated steep hills rise in a few places to the north of Cuttack and taken in connection with the bases and whaleback ridges which stud the surrounding country present all the features of an up-raised archipelago, and lead to the belief that at no very remote geological period the sea of the western portion of Bay of Bengal dashed against many a rugged cliff and rolled around clusters of islands which studded over what is now the Province of Cuttack; indeed, a comparatively trifling depression of the country might reproduce the same

* Excludes two petty *tanki bahal* estates, tauzi numbers 1852 and 1853, with a revenue of Rs. 22.

† Includes a part of Kanika, situated in Balasore.

‡ See Paragraph 610.

§ A fuller description of the geological formation may be found in Section 2 of Mr. N. N. Banerjee's report on the agriculture of the Cuttack,

phenomena. Upon entering the hills they are seen to consist not of long continuous ranges, but generally of insulated and rugged ridges seldom than 10 to 15 miles length and having one uniform direction nearly due east and west, parallel with the lamination of the gneiss and with the main faults of the District. This is better seen near the coast than inland. As to the west of Ungul, the hill ridges, though preserving the same general direction are longer than near Cuttack."

"The hills as well as the low country are for the most part well-wooded and present few naked bluffs (even amongst the almost precipitous sandstone escarpments of the Talcher field). Their outline, however abrupt, is always more or less rounded, and it is evident that they owe their present form principally to marine action".

"Wherever the sandstone of sedimentary deposits rise into hills it presents a totally different aspect; these hills, though generally appearing flat-topped, being found on ascending them to consist of a series of sharp steep ridges separated by deep precipitous valleys, evidently due to the denuding action of fresh water, of the effects of which upon a considerable scale they afford a fine example".

"Laterite has but little extension in Orissa; it occurs to some extent round Cuttack, and frequently borders the hills between that station and Balasore, besides occurring in small patches upon the plains".

"The alluvium of the District contains, so far as observed, no fossils, and having been investigated over a comparatively small area, it is impossible to specify its age. The surface is probably a fresh water accumulation, since during the rains the greater portion of it is subjected to inundations from the numerous rivers flowing through the district; but to what depth this character extends and whether at greater depths any change takes place in its mineral character and composition, are points remaining for future investigation".

21. Through gorges in the mountain system of the Tributary Estates flow three large rivers * the Mahanadi, the Brahmini and the Baitarani and the greatest of these is the Mahanadi.

(1) The Mahanadi, literally, "the great river" has a catchment basin of 48,200 square miles and flowing down through the Barmul Pass debouches in to the plains just above Naraj, some 7 miles above Cuttack and 70 from the sea; at Naraj it bifurcates the northern branch being known as the Mahanadi and the other as the Katjuri.† The latter appears originally to have been a comparatively small stream but during the present century the volume of water passing down its channel increased very considerably, and to regulate the flow, a weir and a training embankment were constructed at Naraj between the years 1860 and 1865; but in spite of this measure, the volumes of water passing down the Katjuri and the Mahanadi channels in the high flood of 1872 were found to be almost exactly the same, whereas in 1855 the ratio of the discharge of the two rivers was, according to Rhind's calculation, as 8 to 10.

Opposite Cuttack the Katjuri throws off to the south a branch called the Kawakhai (or the crow's pool). Its mouth is closed by a bar so that there was no flow of water in it save in flood time. It supplies the district of Puri and has but little effect on Cuttack.

The main stream of the Katjuri gives off a little below Cuttack another branch, the Sirua, which however rejoins it 5 miles lower down. The river then divides again, forming the Sankharisahi island; the main body of water passing down. The Deb and afterwards by the Kundal channel through parganas Sailo, Deogaon and Kate, while the Deb and Tampua, taking a more northerly course, rejoin the Kundal near the Binishpur Hat. The two most northerly branches the Katjuri proper and the Alanka, have been cut off at their head by the Deb left embankment, and the water originally carried by them has been diverted in to the Deb and Tampua.

To return to the Mahanadi. This stream passes to the north of Cuttack and opposite the town gives off a branch called the Birupa.

* See map No. III

† Implying that it could at one time be crossed on a plank "Kat" long and "Jury" joining.

Just below the bifurcation both rivers are dammed by anicuts which control the supply of water to the head sluices of the High Level and Kendrapara Canals. The Birupa about 12 miles farther down throws off a branch called the Bara Ganguti, the two streams enclosing between them the island of Kuhunda Jaipur.

About 18 miles below this bifurcation the Ganguti meets the Kimiria a branch of the Brahmani, and a mile lower down rejoins its parent stream.

The Birupa, thus increased in volume, meets the main stream of the Brahmani a little above Indipur, and the two flow on together, being joined lower down by the Kharsua, and finally debouching in to the Dhamra.

The Mahanadi proper, after passing Cuttack, divides into three branches—to the north the Chitratola, in the centre the Mahanadi, and to the South the Paika. Ten miles further down, the Mahanadi and Paika rejoin, only to separate again into the Sukhpaika and Mahanadi, which meet and pass into the sea near False Point through a number of channels.

The Chitratola throws off one branch, the Nuna, which eventually rejoins it, and the two flow into the Mahanadi, and so down to the sea.

The Brahmani has a catchment basin of 13,700 square miles and enters the plains of Orissa near Janapur, where it throws off a branch called the Kharsua which again divides into the Kharsua and the Patia.

The main stream is crossed by an anicut at Janapur, and a little below this gives off the Kimiria river which falls into the Ganguti, and their united waters again join the Brahmani above Indipur.

The head of the Kharsua is dammed by a cross embankment, and there is an anicut across the Patia at Jakadia to keep a supply of water for the second range of the High Level Canal. The two channels unite a little lower down, and the river flowing through parganas Tisania, Beruan, Kalamatia, and Hatimunda falls into the Dhamra.

The Baitarni, with a catchment basin of 3,900 square miles, forms the boundary between the Cuttack and Balasore districts, and, passing by Chandbali, falls into the Dhamra. At Jakadia it throws off a branch, the Bura, which joins the Kharsua near Beruan.

All these rivers have broad, shallow, sandy beds, very little below the level of the surrounding country. They have but a very gradual fall, that in the Mahanadi and Baitarni varying from about 2 feet per mile, where they enter the plains, to 9 inches at tidal water that of the Brahmini is still less and does not exceed 14 inches per mile anywhere in the plains.

In the hot weather they are nearly dry, the minimum recorded discharge being 70 cubic feet per second in the Baitarni, 129 cubic feet per second in the Brahmani, and 400 cubic feet per second in the Mahanadi.

In flood time, on the other hand, the channels are not sufficient to carry off the whole discharge, which amounts to a maximum of about 1,600,000 cubic feet per second in the Mahanadi, the average of the rainy season being about a third of this amount. In the Brahmini the maximum flood discharge is about 600,000 cubic feet per second and in the Baitarni 315,000 cubic feet.

From June to October floods are of common occurrence in all three rivers. The source of the Baitarni supply being local, it both rises and falls more rapidly than the other two, the floods in it rarely lasting above three days. Floods in the Brahmini commonly last three to five days, and do, on the whole, more damage than those of the other rivers. The Mahanadi takes longest to rise and remains longer in flood than the others.

22. For its protection from inundation a portion of the District has from time immemorial been guarded by embankments, and under British rule this protection has been systematised, and large sums have been expended on the perfecting of the embankments, especially after the disastrous and famines of 1865-66. The law as to the Orissa Embankments is contained in Act III of 1865.

So much has been written by experts on the subject of protection in Orissa that it would be out of place to attempt in a Settlement report to give a detailed account of the constructing, condition, and effect of each and every embankment; but I propose to describe briefly the protected and unprotected areas and then to place on record the conclusions drawn from my observation as to the conditions of the several parganas according as they are more or less exposed to flood. The map. No. I, will show areas liable to flood, and the embankments are shown in map No. III. For a more detailed account, I would beg to refer to Captain Harris' report on the Orissa inundations, 1858; the report on the inundation of 1866; Mr. Taylor's report of 1870 on the Orissa embankments; the reports on the floods of 1882 and 1896; to Mr. Inglis' report now in course of preparation; and to the pargana reports prepared in this settlement.

Under the Mahratta Government the zamindars were bound to maintain embankments, and for this purpose were allowed certain deductions from their *jama*. This system had, however, proved so unsuccessful in Orissa, that from the time of the conquest the British Government undertook itself the maintenance and repair of the embankments, and very large sums were expended for the purpose; but there was no attempt to systematise and down to 1855 it does not appear that more had been done by the Public Works engineers than to maintain and improve the existing embankments. In that year very destructive floods occurred, and Captain Harris, after an elaborate enquiry, pointed to the remarkable coincidence between the rise in the destructive power of the floods since 1831 and the development of the embankment system during the same period, and expressed his opinion that they must be related as cause and effect. In the following years great changes were caused by the protective works in connection with the canals, and it was not until after the disastrous floods of 1866-67 that steps were taken to remodel the system.

In that year the late Mr. W.C. Taylor was deputed to make an accurate record of all existing Government and zamindari embankments, and of the extent to which Government and the zamindars were respectively bound to maintain them. He reported that there were about 510½ miles of Government embankments and 248 miles of the zamindari embankments in Cuttack District, that most of the latter had been as originally constructed of insufficient height and section to withstand heavy floods, and that they were now disrepair and useless. He considered that another 498 miles were required to complete the system, but that, by regulating some of the rivers and closing others entirely, many of the bunds and sluices proposed in the report could be dispensed with and some of the existing embankments abandoned. His proposals were never given effect to.

In 1881 it was decided that, for the time being, the embankments should be maintained as they were until the expiry of the settlement Proceedings.

In 1894 Mr. C.W. Odling, the Chief Engineer of the Irrigation Department, prepared a complete list of embankment to be maintained and abandoned. He divided them all into the following five classes :—

- Class I*— Embankments mostly constructed in connection with the canals which are intended to be kept intact against high or extraordinary floods.
- Class II*— Embankments, chiefly on large rivers, which are mostly above high flood level, and which it will probably be desirable to maintain permanently at their present height.
- Class III*— Embankments which it will probably be eventually desirable to abandon, but which it is proposed to retain until the full effects of abandoning the embankments shown in Classes IV and V are known.
- Class IV*— The embankments in this class are maintained simply because they were in the charge of Government in December 1881, and not because they are supposed to be of any real use to the country. In some cases there is no doubt they are actually harmful, though they may afford some partial protection to particular places, and in all their utility is questionable.
- Class V*— The embankments in this class have already been practically abandoned, as the country they were supposed to protect is now covered by embankments included in Class I.

The total length of embankments in Orissa is 969 miles, of which it was proposed at the commencement of the new settlement to abandon 372 and to retain 597 miles. Of the 597 miles retained, 141 miles are shown in Class III. These Mr. Odling proposed to abandon gradually after careful enquiries in each case. There would thus remain 456 miles of embankments, which it will probably be possible to maintain in an efficient condition. It was not, in Mr. Odling's opinion, likely that it would be necessary for thirty years at least to abandon any embankment included in Class I or II, but there might be alterations in the rivers which would render it necessary to do so.

In Cuttack alone the embankments * to be maintained measured—

			Miles
Class I	....	....	158
Class II	....	....	139
Class III	....	....	35

Another 50 miles under Class IV have also up to date been maintained, making a total of 382 miles against the 510 found by Mr. Taylor. This would give as abandoned 128 miles against 179 according to Mr. Odling's list, the reason for the difference being that many embankments shown as zamindari by Mr. Taylor were actually on the Government list. I understand that Mr. Odling's list has been considerably altered in consequence of the enquiries made in the year 1896-99.

Expenditure.— The expenditure on embankments has been very large.

From 1803 to 1930 the total expenditure in the Province was Rs. 8,09,986, of which half may be debited to Cuttack.

From 1830 to 1866 Rs. 7,66,777 was spent in Cuttack alone. Since the expenditure has been as follows :—

			Rs.
First ten years	....	....	8,83,575
Second ten years	....	....	4,88,133
Third ten years	....	....	5,39,000

These latter figures include a small expenditure on account of embankments in Balasore and exclude an estimated expenditure of Rs. 1,50,000 in Puri from 1895 to 1897-98.

The average annual expenditure has been at different times :—

For—	Rs.	For—	Rs.
1803-30	17,308	1860-66	59,247
1831-45	10,794	1867-76	88,357
1846-52	13,700	1877-86	48,813
1853-59	40,807	1887-96	53,900

The saving since 1876 may be attributed in part to the policy of abandonment of superfluous embankments, and in part also to the large capital expenditure in the preceding decade on the canal embankments which to a great extent supplanted the existing protective works.

I now proceed to consider the embankments in detail, beginning with those on the south of the district. The numbers quoted refer to Mr. Odling's schedule printed as Appendix G.

23. The Kathjuri begins at Naraj and in spite of the anicut, which is built at an angle so as to divert the main body of the stream down the Mahanadi, its channel hardly suffices to carry off all the water it receives in high floods.

The first of its branches, the Baranga Nala, has been closed by an embankment (No. 152) at its head, but this has in former years been breached and much damage has been done by deposits of sand, chiefly in the *lakhiraj* estate of Patia. Lower down, the right banks of the Katjuri and Kawakhai are unprotected, and the water spills over the fields of a few villages of Bakhrabad and is steadily encroaching on the land, while the head of the Kawakhai is still widening.

The country between the Katjuri and Kawakhai rivers is protected by embankments maintained above high flood level (Katjuri right No. 153 and Sirua right No. 188). I am very doubtful whether this protection has proved beneficial;

* See appendix (G)

for there has been little or no increase in the rental and a general falling off in rent rates since the last Settlement, which the people attribute to the more valuable crops grown when there was a regular overflow from the Teljuri river now closed. I find that this part of the embankment was constructed in 1867-68, the floods of 1866 having proved very destructive; the crops now grown appear to be inferior to those of 1842.

In continuation of this for some 8 miles the right bank of the Deb is protected by embankments of which a portion (Nos. 162 to 168) belongs to Government, but the most is maintained by the Zamindars, a cess being collected from the tenants for the purpose. The result is that practically the whole of Sailo pargana is protected from the direct rush of water, but the lower end is still covered by the backing up of the floods from below. This embankment was badly breached about thirty years ago and the people of the riparian villages in Bakhrabad and Kodinda still complain of the damage caused by the deposits of sand.

The left bank of the Katjuri is continuously protected by embankments Nos. 90 to 119, and below that by the Machgaon Canal and the Deb left embankments. These embankments were in former years badly breached and much damage was thereby caused. They are now maintained above high flood level as part of the Taldanda-Machgaon irrigation system, and with the Mahanadi right embankments and the Taladanda canal protect from all floods part of parganas Kodinda, and the rick tracts of Hariharpur, Jhankar, Kurania, Gandito, and most of Tiran, Khandi, and Benahar; about 200 square miles.

Between the Katjuri and the Sirua lies an island partly protected by the Kodinda Islands. Katjuri right and Sirua left embankments, Nos. 188 M. A. or 154 to 161.

These embankments are in bad order, and should, in my opinion, be maintained continuously from Kalpara to Berhampur and from Berhampur to Sarchuan; the lower end of the island will not suffer by being left open, but the rush of water through the gaps and frequent breaches in Govindpur and other villages have caused, and will continue to cause, very serious loss of crops and deterioration of soil unless the embankment is made continuous and kept in repair.

Sankharisahi island, comprising the western half of pargana Saibir, lies between the Deb, the Katjuri and Biluakhai and is exposed to their floods, the old embankments having been abandoned.

I would not recommend the reconstruction of these embankments, but the breaches in the river bank require to be repaired. Much of the land in the island is very rich and, save where there is an exceptionally strong rush of water through a *ghai* or breach, the benefits of the silt deposit appear to counter-balance the risk of loss of the rice crop by flood.

The Deb left embankment No. 261 A., starting from Balia closes the channels of the Alanka and Katjuri and diverts the water down the Biluakhai, along the left bank of which it runs to its junction with the Deb. From there another embankment, No. 261, follows the course of the river down to the end of pargana Kate, where the Kandal joins it to form the Debi river.

These embankments protect from flood that part of Parganas, Saibir, Deogaon, Kate, and Gandito which lies between the Alanka and Deb rivers, and canal water is now available for irrigation in most villages of this tract, some 50 square miles. There is no doubt that this tract has been greatly benefited, probably at the expense of the villages on the opposite side of the river; I do not, however, consider that it requires irrigation beyond the already existing system of irrigation from tanks and streams.

The branches of the Deb are so numerous and perplexing that I shall not attempt any detailed account of them.

The most important of them, indeed of all branches of the Katjuri, is the Kandal river which, starting in pargana Sailo, flows southward through Deogaon and Kate, where

under the name of the Taunla it again meets the Deb. The left bank is throughout Deogaon unembanked, and the water overflows the whole country but does not generally do much harm. To the right a zamindari *bund* partially protects the villages of pargana Sailo, and lower down there is a Government embankment of the fourth class (Nos. 266 to 283, in Mr. Odling's list) from Anlo to Baharana in pargana Deogaon. It is in very bad order and through, if properly maintained, a valuable protection to a limited number of villages, is, in its present state, productive of more harm than good.

The only other embankment of importance on the Kandal are Nos. 265 and 250, protecting a large area in Kate between the Taunla and the Debi. I have no doubt but that these should be maintained, as the direct rush of water from the Kandal would probably cover the whole of this tract with sand.

Between the Kaldal and the Deb left embankment the whole country is a net work of streams—the Goda, the Biluakhai, the Dahikhai, and many others. Formerly these were all more or less embanked, but the policy of Government has, of late years, been to sacrifice these small *bunds* to the maintenance of the big irrigation embankments intact. Most of the embankments have been abandoned, and only here and there remains one that protects a village site or, for some other reason, has been kept up by the zamindars.

From what I have seen of the country I do not think it would be much, if at all, benefitted by the embanking of all the streams, but embankments which keep off the direct rush of the current or protect village sites should, I think, be preserved, and I particularly recommend the following :—

- (1) Embankment in Sasanpada, pargana Deogaon, between the Tampua and Deb rivers now abandoned and badly breached, Nos. 225 to 227 in Mr. Odling's list.
- (2) Embankment protecting mauzas Balada and Rahamba, in pargana Saibir, from the Deb, No. 260 in Mr. Odling's list.
- (3) Gardhua left, No. 257.

In other places embankments are required to close, or sluices to control, the *ghais* or spill channels formed by the floods, as in Palsudha in pargana Deogaon. The zamindars have in parts constructed embankments for such purposes, but they are generally inefficient, and I do not think the Public Works Department would find the cost of keeping the river banks in order prohibitive if they did not attempt to raise the banks above the general level of the country.

It is said that the greater volume of water now passing down the Katjuri, together with the contracting of the waterway due to the closing of the Alanka and Katjuri channels, has caused the loss of crops to be more frequent than it was at the last Settlement. I have myself seen ample evidence of the serious damage done by the deposits of sand, but the *ruidads* * show that inundation was the rule in most of these parganas before 1840 and the country now said to be gradually rising owing to the annual deposits left by rivers.

The numerous channels, too, afford facilities for irrigation which the people avail themselves of freely for the growing of valuable *rabi* crops; and uncertain though the harvest be, it is, in favourable seasons most abundant.

24. Above Cuttack the left bank was formerly partly protected by embankments. The river, has, however, so far encroached on the land that in place the embankment has now disappeared and the water pours over the villages of Panikhand and Atgarh, which are also inundated by a spill from the Sapuanala a tributary of the Mahanadi. Lower down also the villages of Cuttack Haveli and some of those of Tapankhand are heavily inundated, but the total area affected is small and much of the land very inferior; so that I am not sure that to put the embankments in good order would be financially justifiable, though in 1870 Mr Taylor recommended that the embankments should be made continuous down to Chasapara and the *nalas* sluiced.

Cuttack town is protected by a high revetted embankment said to have been (a) Mahanadi right Cuttack Town. originally constructed by Markat Keshari in A.D. 1006.

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.

The left bank of the Mahanadi from Cuttack to Marsaghai follows the Mahanadi Left system 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.

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.

The western end of the triangle 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 unprotected, 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*, castor *arhar* etc.

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

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.

North again from this area the whole tract between the Kendrapara and The Kendrapara-Patamundai Canal system. 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

the people satisfactory, and I have heard 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.

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 embankments. (Nos. 110 to 113) line the channel as far as pargana Keruakhand, 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.

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.

26. From Indalva in Killa Balarampur where the Brahmini enters the plains to Kotpur in pargana Atli, the right bank of the Brahmini 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 embankments would be Rs. 1,000/-.

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

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.

This disposes of the right bank of the Brahmini so far 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 intakes, 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 protect is annually inundated by water from the *ghais* higher up. Below this, the left bank of the Brahmini is open, except for a couple of 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.

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 *dakua* crops go far to compensate the raiyats for the occasional loss of *sarad* rice.

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

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.

Further down, parganas Tisania and Dolgram are protected by the Bara Kharsua Left 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.

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 southern branch, the Bura, joining the Kharsua in pargana Beruan, while the main stream joins the boundary of the Cuttack and Balasore districts.

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 consequence.

On the left Bura is embanked continuously with the Kharsua as part of the Jaipur 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.

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 embankment, embracing most of parganas Jaipur, 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

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."

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.

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 complete, 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 $3\frac{1}{2}$ 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.

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 extension 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 cubic 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 paragraphs are taken from the Irrigation Manual of 1897.

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 the 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.

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 a protective embankment and a thoroughfare 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.

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.

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.

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.

There ranges only have been completed. Range I, from the Birupa to the Brahmani river, a distance 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 surrounding 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 *dahua* 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.

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.

CHAPTER III

PHYSICAL AND STATISTICAL ACCOUNT OF BALASORE

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

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.

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

	Acres.
Area of <i>Lakhiraj bahal</i> lands	1,09,000
Area of temporarily-settled estates	9,59,100
Area of Government lands	13,600
Total	10,81,700
<i>Deduct</i> —lands of Balasore estates in Cuttack district	7,700
Balance	10,74,000
<i>Add</i> —lands of Cuttack estates in Balasore district.	20,900
Total area under settlement of rents in this district or 1,710 $\frac{1}{4}$ 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 $\frac{1}{4}$ 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.

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 Jankunda 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

part of the next century owing to the silting up of the river. It is tidal up to a point above the ferry of Kalikorpor, 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 distance 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.

39. Passing over the Pa'ga' and Nembu rivers, the next of consequence is the Southern rivers. 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 confluent, 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,

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

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.

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.

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.

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 occurred 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.

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 their 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 Rajghat, 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 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 thither 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 Ambohata 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-bullocks, 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.

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 mits manufactured in that neighbourhood.

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 Keonjhar 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.

† Paragraph 68.

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

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.

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.

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.

47. Looking at the figures for the last three years, the cost of maintenance Revenue of the Coast Canal. 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 scarcely sufficed to provide for repairs and depreciation, and there is little doubt but that the service will soon be altogether

* Paragraph 84.

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.

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 Canal 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 supposed 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.

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.

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.

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.

51. Exhaustive enquiries on this subject were made in 1896, and a report was prepared by Babu Sri Gopal Bhattacharjee, 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

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 sufficiently 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 alike were up in arms and I believe their complaints were in some instances substantial. Moreover, very liberal compensation has been paid. *

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 Burabalong 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 remainder 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 Balikband upwards, and widening towards the town of Balasore.

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

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.

Climate.

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 from 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.

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.

* Embankments.

* See map No. IV.

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

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 remainder 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.

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 survive 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 existence of those numerous *tahasilalahidas* 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 designation 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 statistical purposes. The number of parganas* now existing in this district, so far as the temporarily-settled portions is concerned, amounts to 67.

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 temporarily-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-divisions, 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.

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 revision 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.

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.

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

Villages.

of the district villages are smaller and more numerous, while in the south they are larger and fewer.

Becharpari 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.

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

Houses.

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.

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.

Population.

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.

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