Chapter- I

Land and People: Environmental Change and Continuity, 1911-1941.

This chapter attempts to discuss the environmental aspects of the agrarian regime in colonial coastal Orissa. The chapter is divided into two parts. In Part-I we discuss the demographic trends, the factors that determined population growth, the land and man ratio (i.e. density of population), ratio between male and female, rural and urban population, literacy and occupational distribution of population etc. Then the discussion is on the soil types, suitability of different soils to different crops and agricultural practices. Thereafter, we turn to a discussion on the colonial policy on forests, pasture lands and grazing rights that were intricately linked with the agrarian life of the people and analyse how the forest rights & pasture rights of the people were affected by the government policy. In Part-II, we examine the pre-colonial and colonial irrigation system and the changes brought by the colonial rulers during the period under study. The main questions are: What was the limitation of the British attempt in introducing the modern irrigation system? Was the earlier indigenous system better than the British irrigation system? Moreover, it also focuses on the relationship that had emerged between irrigation and productivity.
I.

POPULATION 1911-1941:

(a) Growth of Population:

The demographic picture in Orissa had many vicissitudes up to 1941, after which there was a rapid growth of population. 1 This growth was mainly due to better health services and decrease in the death rate. However, keeping in view of the period of the present study the discussion on population here is limited up to 1941.

Between 1881 and 1891 there was an increase of 7.5 per-cent in the total population of Orissa 2, in spite of occurrences of flood and famine. In 1901 floods, diseases, and scarcity of food checked the progress of population and the rate of increase was below two per cent than the population of 1891. During the period under study i.e. from 1912 to 1939 three decadal Census reports were published (the census of 1911, 1921, and 1931) that provided a lot of information on various aspects of population. In our discussion on population trends in the three districts under study, i.e. the districts of Cuttack, Balasore and Puri, the census periods from 1911 to 1941 have been covered for better understanding and comparison.

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2 In that Census, Orissa included the districts of Cuttack, Balasore and Puri only.
What were the factors that determined the population growth in Orissa during the period 1911 to 1941? Leela Visaria and Pravin Visaria argue that "Population growth was determined essentially by the rate of natural increase or the difference between birth and death rates. And between the two, the level of death rates was more important." Similarly noted Demographers like P.M. Hauser and O.D. Duncan, C. Bradley, R. M. Sarkar and P. C. Kreager conclude that the change in population structure is under the influence of fertility (birth), mortality (death) and territorial movement (migration). In Orissa, the factors that determined the population trends were primarily the condition of health and mortality, and climatic factors determining output in agriculture. The loss of population was more due to the large number of deaths and out migration at the time of natural calamities and agricultural distress. For Orissa to lose her

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6 R.M. Sarkar, 'Biocultural traditions in Anthropology with special reference to India, Man in India, vol. 73, no. 3, 1993, pp. 295- 305.
8 Floods that occurred in Orissa almost frequently was considered a curse, which when followed by drought caused large-scale loss in many parts of Orissa that led to acute poverty and starvation for the population, whose only means of living was agriculture. See W.W. Hunter, Orissa, vol.II, London, 1872, p.174; Surya Narayan Das, Unabinsa Satabdira Orissa, Cuttack, 1979, p.50; Braja Bandhu Bhatta, The Natural Calamities in Orissa in the 19th Century, Commonwealth Publishers, New Delhi, 1997, ch. 1.
agriculture was to lose her all means of livelihood. The more acute was the agricultural distress due to failure of crops the more severe was the loss of population. The ravages of malaria and other diseases, which mostly accompanied floods and cyclones, were also major factors in the loss of population. Agriculture was the principal occupation of a majority of people in Orissa because of which a great deal depended on the condition of agriculture. Table 1.1 shows the area and major demographic indicators like total population, density, sex ratio, decadal variation etc. from 1911 to 1941.

(i) Population Growth and Variation:

The growth of population in Orissa from 1911 to 1941 was not steady. It had a setback in 1911-1921. The population of Cuttack that was 2,109,139 in 1911 rose to 2,431,427 in 1941 having a tridecadal (from the census period 1911 to 1941) increase of 13.26 percent. The population in Balasore district in 1911 was 1,055,568

9 The Weekly Crop Report of Kanika Estate for the week ending 21st July 1915 shows how the loss of beali crop, due to want of rain, in July 1915, and a grim prospect of the sarad cultivation, again due to lack of rain, led to a drought like situation and the poor cultivators and labourers had to starve as the price of rice went up beyond their purchasing capacity. See Kanika Tahsil Records, Accession no. 214 (Orissa State Archives).


11 The table is based on the respective census reports pertaining to Orissa.

12 Census of India, 1921, Part II, Tables, by J.T. Marten, Superintendent, Government Printing, 1923, Table-I.
### Table-1.1: Area and Demographic Profile of the Districts of Cuttack, Balasore and Puri of Orissa Division from 1911 to 1941

<table>
<thead>
<tr>
<th>Area &amp; Population</th>
<th>1911</th>
<th>1921</th>
<th>1931</th>
<th>1941</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cuttack</td>
<td>Balasore</td>
<td>Puri</td>
<td>Orissa</td>
</tr>
<tr>
<td><strong>Area (sq. Miles)</strong></td>
<td>3654</td>
<td>2085</td>
<td>2499</td>
<td>13743</td>
</tr>
<tr>
<td><strong>Total Population</strong></td>
<td>210939</td>
<td>1055568</td>
<td>1023402</td>
<td>5131753</td>
</tr>
<tr>
<td><strong>Males</strong></td>
<td>1001175</td>
<td>504615</td>
<td>506570</td>
<td>2476284</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td>1107264</td>
<td>550953</td>
<td>516832</td>
<td>2655469</td>
</tr>
<tr>
<td><strong>Density (per sq. mile)</strong></td>
<td>577</td>
<td>506</td>
<td>410</td>
<td>373</td>
</tr>
<tr>
<td><strong>Sex Ratio (F. per 1000 M.)</strong></td>
<td>1107</td>
<td>1092</td>
<td>1020</td>
<td>1072</td>
</tr>
<tr>
<td><strong>Decadal Variation</strong></td>
<td>48826</td>
<td>-18074</td>
<td>6118</td>
<td>149611</td>
</tr>
<tr>
<td><strong>Rural Population</strong></td>
<td>2029257</td>
<td>1015628</td>
<td>983716</td>
<td>4954575</td>
</tr>
<tr>
<td><strong>Urban Population</strong></td>
<td>70882</td>
<td>39940</td>
<td>39686</td>
<td>177178</td>
</tr>
<tr>
<td><strong>No. of Villages</strong></td>
<td>5639</td>
<td>3565</td>
<td>3078</td>
<td>15667</td>
</tr>
<tr>
<td><strong>No. of Towns</strong></td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: Census of India 1911, 1921, 1931 & 1941 pertaining to Orissa.
and in the year 1941, it was estimated 1,029,430 with a decrease of nearly 2.54 per cent (See: Table 1.1 and Figures 1.1 to 1.4. and 1.7). In Puri district, the population was 1,023,402 in the year 1911, which increased up to 1,101,939 in the year 1941 having the quadri-decadal increase of 7.13 per cent.

(ii) Growth of population in Cuttack District:

The decade 1901 to 1911 was not at all prosperous. Series of floods, failure of crops and out break of epidemics occurred leading to large-scale migration of people out of Cuttack district in search of work. In 1907, Kendrapara subdivision was the worst sufferer due to a heavy flood, which affected all the coastal districts. In the following year, the district was affected due to the inundation of seawater, which left saline deposits in the coastal belt. The successive failure of crops in the year 1907 and 1908 resulted in the shortage of food. The effect of all these adverse conditions resulted in a small increase of population of 2.4 percent during the decade 1901-11 (See Fig. 1.7).\(^{14}\)

The census of 1921 showed the first decline in the number of population of the district. The first half of the decade from 1911 to 1921 was a period of steady prosperity, in spite of seasonal floods. However, the second half of the decade witnessed natural calamities of

\(^{13}\) See Map no. 1, the map of Cuttack district.

greater proportion and the effects of the First World War. The disastrous epidemic of influenza appeared in the year 1918 and lingered on for a longer period that was more than in any other district of the state. Failure of monsoon resulted in reducing stocks of food grain, and at the same time prices of food grains rose up because of war conditions. The last two years of the decade brought more severe floods and more disastrous epidemic of cholera, dysentery and fever. Scarcity of food grains was felt all over the district and particularly in Banki, Narsingpur and Baramba due to failure of bhadoi crops. The birth rate was severely affected due to repeated visits of epidemics. All these encouraged out migration with the result that the population of the district in 1921 was decreased by 2.8 percent. (See table 1.1).

The district had a period of distress in various forms in the decade 1921-31. The aftermath of war was effectively felt in every field. There were natural calamities resulting from floods and epidemics. The number of deaths was in excess of the number of births in 1921. Although the following years were not bad, the year 1924 showed a large increase in death rate which outnumbered birth rate to the extent of five per thousand persons. The decade 1921 to 1931 was a decade of floods and epidemics of cholera, malaria and dysentery.

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16 The occurrence of floods of exceptional magnitude brought serious disasters leading to loss of life and agriculture etc. See B.D. Richards, Flood Estimation and Control, Chapman & Hall Ltd., London, 1944, pp. iii-iv.
However, inspite of all these adverse conditions, the district showed an increase of 6.4 percent, which was the highest increase during the first half of the 20th century. This unprecedented increase amidst adverse conditions was explained partly due to the return of the emigrants, and partly due to the rapid growth of population in Cuttack town, which was the headquarter of the Orissa division.

In the decade 1931-41, the overall performance of agriculture and health conditions was better than the earlier decades. During this decade the population of the district increased by 4.7 percent than the figure of 1931. Nevertheless, the decade was not free from the usual adversities faced by the coastal people such as the floods and diseases. Ruinous flood came in repeatedly or every two or three years i.e. it occurred in 1933, 1934, 1937, 1939 and in 1940. The flood of 1937 was the highest in living memory that caused several breaches in embankments and in spreading sand over cultivated land and causing damage to crops. The floods of the decade also caused considerable damage to crops. In the year 1936, Jajpur sub-division was subjected to the desolation of a cyclone. There was partial failure of crops in 1933, 1937 and 1939, and the harvest of 1941 was very

17 The increase of population in Cuttack district in 1951 was 3.3 percent and in 1961 it was 21 percent. See Census India, 1961, District Census Hand Book, Cuttack District, p.11.

poor. Cholera was widespread throughout the decade but was particularly more destructive in the year 1932, 1935, and 1939. The most virulent attack of cholera occurred in the year 1939 when the death alone rose to high figure of 4.1 per mile. Small pox was not so active as cholera but it was extensive in 1938 and 1940. The district was also a frequent sufferer from fever, diarrhoea and dysentery. However, in spite of these adverse conditions there was overall prosperity, which created favourable conditions for the growth of population.

(iii) Growth of population in Balasore District:

According to the census of 1911, there was an increase in the population in the districts of Cuttack and Puri. However, this census showed a decrease in population in Balasore district by minus 1.71 percent. (See Table 1.1 and Figure 1.7). In 1921, the population of Balasore also decreased like other districts. In 1931 and 1941 although the population increased by 1.02 percent and 3.77 percent respectively yet it was below the 1911 figure. Bad health, poor harvest due to inadequate rainfall, food scarcity due to failure of crops etc. were the main reasons of the slow or negative growth of population. The net loss of population was more in the decade 1911-21. Droughts

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19 See Map No. 1.2, Map of Balasore District.

20 Census of India, 1911, vol. V, Bengal Bihar and Orissa, and Sikkim, Part II, Tables by L.S.S. O'Malley, Bengal Secretariat Book Depot, Calcutta, 1913, Table- I and II.

due to insufficient rain and floods due to heavy rain played havoc in this district where irrigation facility was scanty or absent.\textsuperscript{22}

From 1921 onwards the district had years of unhappy events. Recovery from the effect of influenza and malaria was not seen until the last year of the decade. The first seven years of the decade were particularly unhealthy as the number of deaths always exceeded the number of births. The principal factor leading to the decay of population in these years was malaria, which assumed a destructive form in an extensive scale, particularly between the years 1921 and 1926. In 1926 due to severe floods there was out break of small pox. During the last quarter of the decade 1921-31 birth rates increased and death rate fell. This was due to better health conditions and a check in the tropical diseases. The census of 1931 showed an increase of population by 1.2 percent above the 1921 level but remained below the figure of 1911. The increase in population in Balasore district in the 1931 census was the lowest in comparison to other districts of British Orissa.\textsuperscript{23}

During the decade 1931-41, the district enjoyed the most prosperous times within the first half of the twentieth century.\textsuperscript{24}

\textsuperscript{22} On agricultural distress in Balasore district, see Bihar and Orissa, \textit{Revenue Department, Agriculture Branch}, B Proceeding, Nos. 153-163, December 1915.


\textsuperscript{24} It may be mentioned that unlike the districts of Cuttack and Puri the Balasore district had a decrease in population in the census of 1951 by - 0.2 percent. See Census of India, 1961, \textit{District Census, Balasore}, p.11.
Public health in Balasore was much better during the decade than it was previously. However, the district was not completely free from epidemics and diseases. There was a severe outbreak of cholera in the year 1932 and other disease like dysentery and diarrhoea occurred occasionally. The condition of crops was comparatively better as the rainfall was sufficient. The census of 1941 recorded a moderate increase of population of about 3.77 percent which was the lowest than the other districts (see figure 1.7).

(iv) Growth of population in Puri District:25

Until the census of 1931, the population of Puri was always smaller than the population of Balasore. However, owing to its more rapid growth during the decade 1921-31 it gained a little more population than the Balasore District (see Table 1.1 and Figure 1.7). During 1911-1921 the population of Puri district decreased by as much as 7.0 percent. The decrease in population in this decade was attributed to agrarian distress and deaths due to cholera and fever. There was heavy flood26 in 1917 and drought in 1918 and the spread of influenza epidemic during 1918-19. In 1919, there was a recurrence of heavy floods, which submerged a large part of the Sadr sub division. Although the crops of 1920 were reasonably good the...
death rate continued high while the birth rate remained low. The rate of increase in population in Puri district during the 1931 census, as given in Table 1.1 and Figure 1.7, shows that it was highest in comparison to the other districts of Orissa. The large share of this growth was due to the increase of population in the Khurda Sub-Division, which enjoyed much better health than the rest of the district and was more or less free from floods. Moreover, there was return of emigrants due to the bumper crops during 1928-31. The period from 1931 to 1940 was one of general prosperity like that of the other districts. Although there was occurrences of diseases like cholera, smallpox, dysentery and diarrhoea, public health was much better than it was previously.

(b) **Land and Man Ratio:**

The census of 1911 recorded the average density of population of Orissa as 508 persons per square mile. The density of population was higher in coastal Orissa than the rest of Orissa (see Table 1.1 and Fig. 1.5). The higher density of population was found in Salepur,

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28 All the three districts of coastal Orissa had three zones, the first being the unproductive maritime strip, the second the cultivated central plain formed of rich alluvium, and the third a broken hilly region on the west. The strip along the coast was in many places impregnated with salt, and a great part of it was unfit for cultivation. It was swampy and traversed by sluggish brackish streams. The central portion, which formed the delta proper, was an alluvial plain with a teeming population and a fertile soil. The third consisted of a submontane undulating area, in places broken by hills, with a sterile soil that supported a scanty population.
Fig-1.5: Density of Population in Orissa, 1911-1941

Fig-1.6: Sex Ratio of Orissa, 1911-1941
Fig-1.7: Decadal Variation of Population Growth in Orissa, 1911-1941

Fig-1.8: Distribution of Rural Population in Orissa, 1911-1941

Fig-1.9: Distribution of Urban Population in Orissa, 1911-1941
Jajpur, and Kendrapara thanas in Cuttack district where the average population density was 800 per square mile. The maximum density of 963 was reached in Salepur. This was because of the fact that the area was situated in between two large branches of the River Mahanadi and about 31 per cent of its cultivated area were irrigated by the Orissa Canal System. All the thanas along the seacoast to the east and the hilly tract had fewer than 400 persons per square mile. In Balasore district, every Thana contained either saline soil or uncultivated laterite. Density was as low as 288 persons per square mile in Chandbali, a large part of which consisted of waste lands having high grass and mangrove forests. The highest density of population in Balasore district was in the Bhadrak Thana having 638 per square mile because of the fact that this Thana had large areas of fertile plains. Balasore Thana, which was headquarter of the district, supported only 536 persons per square mile. The reason for this low density was that part of the Balasore Thana was covered by the seaside saline strip on the east and the undulating tract in the west. Whereas, the density of population in Puri district, which had an average density of 410 persons per square mile, was far less than

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30Ibid.
any other district of Orissa, owing to the area occupied by hills, forests and water.\textsuperscript{31}

(c) \textit{Sex Ratio:}

The sex ratio in three districts during the period of study was in favour of females (see Table 1.1 and Figure 1.6). Figure 1.6 shows the ratio of females per 1000 males in three districts and the total of British Orissa. As the figure shows there was a rising trend in the number of females up to 1921 and thereafter there was a gradual decline in their number in all over Orissa except in the Puri District where an upward trend was noticed again in 1941. The fall in the number of female population after 1921 was because of the return of male emigrants. \textsuperscript{32}

Table 1.1 (in the sex ratio column) shows the number of females per 1000 males in the three districts and the average of British Orissa. The bar diagram in Figure 1.6 shows the fluctuations from decade to decade. One noticeable feature in the sex ratio common to all the districts in Orissa was that the female population was higher in 1921. As discussed above there was a fall in the population in all these

\textsuperscript{31} Reserved and protected forests extended over 485 square miles in Puri district. Moreover, about 310 square miles of the Chilka Lake was in the Puri district. The Chilka Lake covered about 450 square miles of area during the rains and 350 square miles during the rest of the year. The Pipli along with Nimapara in the center of the Puri district.

\textsuperscript{32} Census of India, 1921, op.cit, Table- I.; Kingsley Davis, \textit{The Population of India and Pakistan}, Princeton University Press, Princeton, 1951, p. 64.
districts in 1921. However, the number of females to total male population increased significantly in this census. The reason for this variation was attributed to the out migration of male population. This movement of male population in the 1921 Census was comparatively higher because the decade 1911-21 was a decade of distress, which led to the out migration of more males than females to earn a better wage. Nevertheless, there was overall loss of population of both males and females, during the decade from 1911-21 due the natural calamities discussed earlier.

(d) **Rural Population:**

The rural population of Orissa constituted about 96 percent of the total population (see the column on Rural population in Table 1.1 and Figure 1.8). There was no remarkable change in the proportion of the rural population, which indicates the over dependence of population on agriculture. The absence of industrial centres and poor educational facilities contributed to this over dependence.

(e) **Urban Population:**

In the three districts under study, there were six towns. 33 The district of Cuttack had three towns i.e. Cuttack Sadr, Kendrapara and Jajpur, Balasore had two towns i.e. Balasore Sadr and Bhadrak and Puri had only one town in its headquarter. The number of towns did not change during the period under study. The two towns of Cuttack

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and Puri accounted to more than 50 percent of the total urban population of British Orissa in 1931. The rate of increase of urban population in all the three districts was slow\(^{34}\) (See the column on urban population in Table 1.1 and Figure 1.9). The urban population of Cuttack district in 1911 consisted of 3.4 per-cent of the total population\(^{35}\) of the district. It gradually increased up to 1931 i.e. 3.7 per-cent in 1921 and 4.1 per-cent in 1931. In 1941, however, there was a marginal decrease (4.0 per-cent) because of the inclusion of new areas in Cuttack in the Census of 1941. In Balasore district, the proportion of urban population to the total population was same in 1911 and 1941 i.e., 3.8 percent. During the census period 1921-31, it had a decline to 3.6 percent. In Puri district, the growth of urban population had a different trend. It was higher than the other districts in 1911 i.e., 3.9 percent, and increased up to 4.1 percent in 1921. In 1931, it declined to 3.6 percent and it had a marginal increase in 1941 i.e., 3.7 percent. The fluctuation of urban population in Puri town was attributed to floating population of pilgrims\(^{36}\) who visited the famous temples of the town (some pilgrims stayed back either temporarily or permanently). The proportion of males to females was always higher in


\(^{36}\) Ibid., pp. 39-40.
the towns than in the rural areas. This was mainly due to two reasons. The first was that the immigrants were mostly males. Secondly, women had a limited role in the urban occupations like business, trade, commerce and industry etc. It is the lure of a professional or business career that attracted male immigrants to the urban centres, who left their families at their native place.  

(f) Migration:

The movement of individuals or groups, which involved a permanent or semi-permanent change of usual residence, was termed in the Census as migration. Migration greatly influenced the size and composition of population, especially at a local level. The census of 1931 had distinguished five different types of migration i.e. Casual, Temporary, Periodic, Semi-permanent and Permanent.  

Casual: This covered the minor movements of population between village to village. Such movements did not appear in the census returns unless the village in question happened to lie on opposite sides of the line, which divided one district with another. Females usually figured in this type of migration due to the practice of inter-village marriages.

Temporary: Temporary migration was due to temporary demand of labour when new roads, Buildings, or railways were under

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38 Ibid., pp. 103-104.
construction, due to journeys on business, visits to fairs and places of pilgrimage etc. This type of emigration was also due to displacement of population resulting from out breaks of plague and other diseases in a particular area and the prevalence of scarcity or distress for a limited period.

**Periodic**: This was a special type of migration, associated more particularly with the seasons of the agricultural year. When work was slack in the fields, labour moved away for temporary employment elsewhere. The seasonal movement of pastoral nomads also came under this category. This periodic migration was great in number in Orissa.

**Semi-permanent**: The native of one place resided and earned their living in another place, but they often retained connection with their own homes, where they maintained their families and visited them from time to time, and returned in their old age. This category of migration came under the Semi-Permanent type.

**Permanent**: This type of migration occurred due to the desire of the people to migrate from their overcrowded native place or to settle in an advantageous locality superior to their native place.

One interrelationship that emerged between the latter three categories of migration was that the periodic migration sometimes became semi-permanent and semi-permanent migration became permanent. In migration of the periodic and semi-periodic type, the
male sex predominated very largely but when the movement became permanent, there was little difference in the number of males and females (because females also accompanied males). 39

(i) Out-migration:

In general, the pursuit of agriculture, which was the main occupation of the vast majority of the people, did not foster the spirit of adventure. It also did not furnish much scope for the agrarian population to go out of their native place to search for a living away from their agricultural field. Furthermore, the caste system and its associated social customs helped to tie a person down to his own village. The diversity of languages was also another factor that deterred people from moving away from their own native locality or province.

However, inspite of the factors mentioned above, there were large scale out migration (emigration) of people from the three districts to earn for their living. This migration was mostly periodic or temporary and was due to the agrarian distress, floods, famines and epidemics. The introduction of railways\textsuperscript{40} in Orissa from 1898 onwards provided better facility for communication with the outside world, than previously existed, which stimulated in and out migration.

\textsuperscript{39} Ibid.

\textsuperscript{40} For Railway Communication in Orissa during the early 20\textsuperscript{th} Century see Ganeswar Nayak, \textit{Development of Transport and Communication, A Case Study}, Anmol Publications, New Delhi, 2000, pp. 70-125.
Large number of people from British Orissa (especially from the three coastal districts) were attracted to the sparsely inhabited Feudatory States of Orissa, where much arable land was available. This occurred during the 1920s when the coastal districts were greatly affected by floods, epidemics, and scarcities. The greater number of emigrants, however, went to other provinces particularly to Bengal, Assam, Central Provinces, and Burma. A large number went to Calcutta and its neighbourhood as domestic servants, watchman, industrial workers and labourers. Some Oriyas were found working as cooks and domestic servants throughout Bengal and in Sundarbans as cultivators and field labourers. This emigration was mostly temporary or periodic. There were large-scale emigrations from Orissa Division as soon as the failure of the rice crop became manifest. The government tried to alleviate the distress to some extent by undertaking famine relief measures like granting of land improvement loans on generous scale and under the Agriculturists

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42 See notification no. 3032 in Banki Tahasil Records, General Department, F.No. 3 of 1933, (Accession No. 3773 O.S.A.).

43 See letter no. 3391, dated 18 October 1917, from F.P. Dixon, Collector of Puri to the Commissioner of Orissa Division, (Final Report on the Scarcity which prevailed in the area between Chilka Lake and the Bay of Bengal) in Bihar and Orissa, Revenue Department, Agriculture Branch, Proceeding Nos. 106-119, February, 1918.
Loans Act for purchase of seeds for the next crop.\footnote{See letter dated. Bankipur, 14 August 1919 from J.A. Sweeney, Secretary to the Board of Revenue, Bihar and Orissa to the Secretary to the Revenue Department, Govt. of Bihar & Orissa, in Bihar & Orissa \textit{Revenue Department, Land Revenue Branch}, Proceeding Nos. 8-9, July 1920.} Nevertheless, the process was too cumbersome for the ordinary Oriya cultivators to take the benefit of it and ultimately they went out to seek employment in Calcutta, Burma and other places as wage earners. The emigrants went out after the rice harvest and returned at the break of the monsoon bringing with them whatever they earned by their labour.\footnote{L.S.S. O'Malley, \textit{Bihar and Orissa Gazetteers, Puri District}, Patna, 1929, p. 67, (here after referred as Puri District Gazetteer).} According to the census of 1921 and 1931, the Province of Bihar and Orissa lost more by emigration than by any other Indian Province.\footnote{\textit{Census of India, 1931, vol. VII, Bihar and Orissa, Report}, p. 137.}

(ii) \textit{In-migration}:

The average number of persons who came in (immigrants) to the districts of Cuttack, Balasore and Puri were less in comparison to the number of persons who went out of the districts (emigrants). But in the Feudatory states of Orissa the number of immigrants were more than the emigrants. The pilgrim centres of Puri town, Satyabadi, and Bhubaneswar attracted thousands of pilgrims every year, particularly during certain festival seasons which increased the number of immigrants. The introduction of railways facilitated easy movement of
population\textsuperscript{47} and Oriyas returned to their native place from outside the province at intervals that were more frequent.\textsuperscript{48}

Emigration from the British districts to the Feudatory States of Orissa was large in 1921 but owing to some alleviation of economic distress in British Orissa, this had a declining trend in 1931.\textsuperscript{49} However, the number of emigrants in 1931 onwards to places outside Orissa increased. This was mostly due to the better wages that the other provinces offered.

\textbf{(g) Literacy:}

Table 1.2 and Figure 1.10 compares the male and female literacy in Orissa in 1911 and 1931. The literacy percentage shows the number of literate persons within the same gender group.\textsuperscript{50} There were no remarkable changes in the literacy level of the population of the three districts and the rest of British Orissa over the period from 1911 to 1931. The figure 1.10 indicates that there were more male literate persons in the district of Balasore, which rose from 13.58 percent in the year 1911 to 15.96 percent in 1931. The district

\textsuperscript{47} L.S.S.O'Malley, \textit{Memorandum on the Material Condition of the People of Bengal and Bihar and Orissa, in the year 1902-03 to 1911-12}, Darjeeling Branch Press, Darjeeling, 1912, p. 5.

\textsuperscript{48} \textit{Cuttaick District Gazetteer}, op.cit., p. 45.

\textsuperscript{49} However, during the late 1930's, when there was widespread oppression of the subjects and due to the prevalent political tensions in the Feudatory States, people from these states migrated to the neighbouring districts. We have discussed this aspect in Chapter VI.

\textsuperscript{50} The literacy percentage calculations have been in relation to the total number of males for the male literacy and females for the female literacy in the respective areas.
Table-1.2: Male and Female Literacy of Orissa in 1911 & 1931.

<table>
<thead>
<tr>
<th>Literacy</th>
<th>Cuttack 1911</th>
<th>Balasore 1911</th>
<th>Puri 1911</th>
<th>Orissa 1911</th>
<th>Cuttack 1931</th>
<th>Balasore 1931</th>
<th>Puri 1931</th>
<th>Orissa 1931</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (No.)</td>
<td>133002</td>
<td>68546</td>
<td>54880</td>
<td>281474</td>
<td>151796</td>
<td>76682</td>
<td>62229</td>
<td>334920</td>
</tr>
<tr>
<td>Female (No.)</td>
<td>6028</td>
<td>2913</td>
<td>2621</td>
<td>12611</td>
<td>11328</td>
<td>4850</td>
<td>5243</td>
<td>24433</td>
</tr>
<tr>
<td>%</td>
<td>0.54</td>
<td>0.53</td>
<td>0.51</td>
<td>0.47</td>
<td>0.99</td>
<td>0.95</td>
<td>0.98</td>
<td>0.89</td>
</tr>
<tr>
<td>Total (No.)</td>
<td>139030</td>
<td>71459</td>
<td>57501</td>
<td>294085</td>
<td>163124</td>
<td>81532</td>
<td>67472</td>
<td>359353</td>
</tr>
<tr>
<td>%</td>
<td>6.59</td>
<td>6.77</td>
<td>5.62</td>
<td>5.73</td>
<td>7.49</td>
<td>8.23</td>
<td>6.52</td>
<td>6.77</td>
</tr>
</tbody>
</table>

Source: Census of India1911, Vol.V, Bihar and Orissa, Part III, Table-VIII; Census of India1931, Vol.VII, Bihar and Orissa, Part II, Table-VIII

Fig-1.10: Male and Female Literacy of Orissa in 1911 & 1931
Balasore predominated in the literacy rate over the other two districts. However, there was an overall increase in literacy in all the districts in the year 1931, compared to 1911. The literacy of females in Orissa was very low and negligible in comparison to the males (see Figure 1.10). However, there was a marginal increase in the female literacy yet it unfortunately remained less than one percent over the said twenty-year period.

(b) **Occupational Distribution:**

A great majority of people in Orissa were dependent on 'agriculture and cognate professions'.\(^{51}\) Table 1.3 displays occupational distribution per 1000 population in Orissa in 1921 and 1931.\(^{52}\) As the Table 1.3 shows 62.4% population were engaged in agriculture in 1921, which increased to 69.6% in 1931. On the other hand, there was a significant decline in population supported by Industry and Commerce in 1921-31. (See Table 1.3 and Figure 1.11).

Among the people who depended on agriculture, we find two main subdivisions i.e. people whose principal occupation was pasture and agriculture and people who took agriculture as their subsidiary occupation. When we look at the persons having pasture and agriculture as their principal occupation, we find the number of males was significantly higher than the females. The female participation in

\(^{51}\) L.S.S.O'Malley, *Memorandum on the Material Condition of the People of Bengal and Bihar and Orissa, in the year 1902-03 to 1911-12*, op. cit., p. 1.

\(^{52}\) *See Census of India, 1931*, vol.VII, op.cit., p. 188.
Table-1.3: Occupational Distribution per 1000 Population in Orissa in 1921 & 1931

<table>
<thead>
<tr>
<th>Occupations</th>
<th>Census Years</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1921</td>
<td>1931</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>624</td>
<td>696</td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>161</td>
<td>139</td>
<td></td>
</tr>
<tr>
<td>Commerce</td>
<td>101</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>Profession</td>
<td>31</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Other occupations</td>
<td>83</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

Fig-1.11: Occupational Distribution per 1000 Population in Orissa in 1921 & 1931

![Bar chart showing occupational distribution in 1921 and 1931]
Table 1.4: Principal Occupation (Pasture & Agriculture) of Male & Female in Orissa in 1911 & 1931

<table>
<thead>
<tr>
<th>Classification</th>
<th>1911</th>
<th>1931</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cuttack</td>
<td>Balasore</td>
</tr>
<tr>
<td>Male No.</td>
<td>410841</td>
<td>263613</td>
</tr>
<tr>
<td>%</td>
<td>41.04</td>
<td>52.24</td>
</tr>
<tr>
<td>Female No.</td>
<td>44903</td>
<td>15586</td>
</tr>
<tr>
<td>%</td>
<td>4.05</td>
<td>2.83</td>
</tr>
</tbody>
</table>

Source: Census of India 1911, Vol. V, Bihar and Orissa, Part-III, Table-X; Census of India 1931, Vol. VII, Bihar and Orissa, Part-II, Table-X.

Fig 1.12: Principal Occupation (Pasture & Agriculture) in Orissa in 1911 & 1931
this profession remained low during the period. However, the number of males having pasture and agriculture as their principal occupation went on increasing in Cuttack district (this may be attributed to decline in industry and commerce and the better irrigation facilities and better scope for double cropping and rabi crops), whereas their number had a declining trend in Balasore and Puri districts (see table 1.3 and Figure 1.12).  

On the other hand the number of females whose principal occupation was pasture and agriculture went on increasing in all the three districts (see table 1.3 and Figure 1.12).

II. LAND USE PATTERN AND AGRICULTURAL PRACTICES:

(a) Soil:

What were the soil types in the coastal districts? What was the relation between the composition and level of soil with that of the pattern of cultivation? We attempt to examine in this section these questions along with a description of the peculiarities of the soil and its characteristics which throw light on the suitability of different crops

53 As shown in Table 1.4 the number of males, whose principal occupation was pasture and agriculture was highest in Balasore district in comparison to the districts of Cuttack and Puri. This may be related to the greater loss of population in Balasore district in 1921 Census (which supports the point that agrarian distress, that were greatly inter linked with the natural calamities and diseases, contributed to the loss of population). As Balasore had more people dependant on agriculture, it was but natural to have a greater loss of population during the adversities that badly affected the agrarian life.

54 See Ibid.
in different soils in the three Coastal districts under study. The three districts under study embraced the rich deltas of the Mahanadi, Baitarani, Subarnarekha and its tributaries and was bounded by the Bay of Bengal on the southeast, and walled in on the northwest by tributary hill states. It had mainly an alluvial tract, which consisted, of sand and clay brought down by big rivers. This alluvial area was divided into two categories i.e. the older alluvium and the newer alluvium. The newer alluvium type of land, which was mostly found in the river delta, was comparatively less than the older alluvium type of land. Rest of the coastal lands was of the older alluvium type of land, which were subjected more frequently to denudation than to deposition. This older alluvium usually consisted of alternating beds of sand and clay, frequently containing large quantities of Kankar or nodules of carbonate of iron. However, one special feature of this older alluvium was that, in most cases, beneath the clay beds the ground water level was higher.\textsuperscript{55}

The surface feature of the older alluvium varied in character. This was mainly due to differences of level, but partly also to general differences in chemical and physical composition. Although, as a rule,

any crop could be grown in any district yet in practice certain crops flourished much more in certain districts than in others. For example, the tobacco crop was grown very widely in certain areas and hardly at all in others. Such marked preference of a crop for the soil of a certain type points to marked peculiarities in that soil. This peculiarity due either to the difference of level or to difference in the character of the sediment brought down by the rivers, which helped in the soil formation. In fact, each river basin had its general characteristics. The newer alluvium type of soil was generally richer in plant foods, than the older alluvium, particularly in nitrogen in which the older soil was markedly deficient. Only in the Mahanadi delta and diars of all the rivers this type of soil was found.56 The laterite soil was different from the alluvial soil. It consisted of nodules of brown hematite and coarse quartz sand. This soil was very poor in the essential ingredient of plant life.57

The following table (Table-.1.5) shows the types of soil and the classes of crop grown on each type of soil.

56 Ibid. p. 3
Table-1.5: Type of Soil and Crops Grown in Orissa.

<table>
<thead>
<tr>
<th>Soil</th>
<th>Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay Soil</td>
<td>Winter rice except in low lying places which were flooded until late November. On such lands Rabi crops such as mustard were grown</td>
</tr>
<tr>
<td>Clay loam</td>
<td>Rabi crops in the high lands. Winter paddy on the low lands. Good for Sugarcane on high lands</td>
</tr>
<tr>
<td>Loam</td>
<td>Mainly rabi crops. Good land for sugarcane.</td>
</tr>
<tr>
<td>Sandy Loam</td>
<td>Rabi crops and Maize</td>
</tr>
</tbody>
</table>

**Source:** *Bihar and Orissa Administrative Report for the year 1912-13.*

The cultivators in coastal Orissa recognised a large number of different classes of soil, the names of which varied according to their situation, elevation and composition. Ordinarily in the village, land was categorised under three main divisions i.e., (i) the low lands retaining rainwater called *jala* or wet lands, on which winter rice was grown. These lands covered about 70 percent of the whole-cultivated area. (ii) The high lands round the village homesteads, which, being enriched by manure and household refuge, had a blackish colour and were therefore called *kala* or *kala diha*. These lands were used for growing cotton, jute, vegetables and other valuable crops. (iii) The riverside lands, which were locally known as *pala*, were periodically...
fertilised by deposits of silt. *Pala* lands were suitable for growing tobacco, cotton, mustard and other rabi crops.\(^{58}\)

Arable lands were also classified according to their elevation. The low-lying land producing rice was called *khal* and the high land as *dhipa*. The land situated on a level between the above two were known as *madhiana*. The low lands were further divided according to the difference in level viz. *jora*, *dera* and *gahira*. *Jora* was the name given to the hollows which collect the drainage of the surrounding high lands, and, being always waterlogged, were used only in the dry season or for very coarse verities of rice. The *dera* lands were those situated at a higher level on the sides of the hollows and the *gahira* lands were those lying still further up. The high lands that were locally known as *thena*, *thengi* or *danga* were referred as wastelands. These lands were not enriched by silt and were incapable of retaining rainwater.\(^{59}\)

The soils were again divided into four classes according to their composition, viz. (1) *Matal* or clay lands, (2) *Dorasa* or loamy soil, (3) *Balia* or sandy lands, and (4) *Patu* or alluvial soil. The cultivators, recognised a large number of minor distinctions and gave different names to the soils according to the extent to which clay, sand, loam


\(^{59}\) *Cuttack District Gazetteer*, op.cit, p. 81.
and silt predominated in their formation. For example, (1) *Matal* was the name given to all kinds of stiff clayey soils. Rice, Sugarcane were the principal crops grown on them, but besides these wheat, *birhi* and *Kulthi* were also cultivated. (2) *Chikita* was strong sticky clay, which was almost too stiff to be used for successful cultivation, and grew for mostly coarse varieties of the *sarad* or winter rice. The out turn on such lands was said to be generally very poor. (3) *Chauria* was also hard clay, which was very liable to re crack on being exposed to the sun when ploughed. It generally cracked into hard blacks on getting dry, and was altogether an inferior soil. *Dorasa* was a mixture of sand and clay in nearly equal parts. It was used for *beali* or autumn rice and for all rabi crops. It was easily worked and was retentive of moisture. (5) *Telbalia soil that* contained larger admixture of sand than the *dorasa* lands was looser in texture, and being poorer in quality required more manuring than the later. (6) *Baliamatal* was a rich sandy loam with a large admixture of earth. (7) *Rangamati*, a red ferruginous sandy loam, was found near laterite rocks. Like *telbalia* it required a great deal of manuring for producing good crop. (8) *Thenga jami* was an elevated sandy loam with very little moisture, which was allowed to lie waste, though sometimes ploughed up for growing paddy, mandia and *kulthi*. The out turn of crops on such lands was very poor. (9) *Balia* was the name given to very loose sandy soil, which grew the poorer kinds of rabi crops. (10) *Patu* was an alluvial soil
formed from silt deposited by floods. It was used for tobacco, jute, coriander, mustard, and all kinds of miscellaneous crops. (11) Pankua was black mud unmixed with sand, such as the kind of soil found at the bottom of ponds and tanks. (12) Nunajami was land that was more or less of saline in nature. It was generally of very little use, but a few varieties of laghu sarad rice were grown on it when it did not contain an excess of salt.60

In the Puri sub-division the soil was of the unusual alluvial type found in deltaic country, except in the west, where the sub-division encroached on the laterite uplands of Khurda, and on the south and east, where the sandy littoral formed a belt of varying width. There was every variety of soil from almost pure sand to almost pure mud, but generally the higher soils such as the sandy loams were most abundant in the north, where there was much diversity of level, and the black soils found more widely in the lower levels of the southern pargana. A soil of a blackish-white colour found near Chilka Lake had salinity in it.61

The soil of Khurda, formed of rocks, sandstone and clay soils62 were mostly fertile. However, the great desideratum was water. If there

60 Ibid., pp. 81-82, N.N. Bannerjee, op.cit, pp. 51-52.
61 For a detail description of the soil in the Puri district, see Puri District Gazetteer, op.cit. pp. 164-165.
was sufficient supply of water even a few inches of soil on the beds of laterite, produced a fine crop of paddy. In case of deficient rainfall the paddy crop was rapidly withered and was damaged.63

Balasore was naturally divided into three well defined tract-the salt tract along the coast, the arable tract or rice country, and the submontane tract or jungle land. These three tracts appear as if they had been divided off artificially from each other by the coast canal, Trunk Road and Railway line respectively. The salt tract runs the whole way down the coast, and formed a narrow strip from 2 to 6 miles broad, traversed by sluggish brackish streams creeping along between banks of black mud. Towards the beach, this region rise in sandy ridges from 50 to 80 feet high, sloping inland.64

(b) Crops and modes of cultivation:65

(i) Rice:

Rice was generally known as dhan or dhanya signifying in Sanskrit “the supporter or nourisher of mankind.” Rice was the chief crop in Orissa,66 which was grown in 92 to 98 percent of the cultivable

63 Ibid. For a description of the soil categories in Balasore, see L.S.S. O’ Malley, Bengal District Gazetteers, Balasore, Calcutta, 1907, pp. 1-16, (hereafter referred as Balasore District Gazetteer).

64 Balasore District Gazetteer, op.cit., pp. 1-16.

65 Chapter IV discusses the area, acreage, and out turn of various crops in the three districts from 1912-13 to 1942-43. Here the focus is on the agricultural practices and its general features.

land. There were innumerable varieties of rice familiar to cultivators under distinctive names and possessing peculiar properties. Generally, they were classed in three main groups according to the season of the year when they were reaped i.e. autumn rice, winter rice, and summer rice. Autumn rice or beali was sown in May or June and reaped in August and September; winter rice or Sarad was sown in June and July and harvested between October to January, and summer rice or dalua was sown in water logged depressions especially after the floods in the cold weather and harvested in March and April.

The system of double cropping was not widespread. It was limited to some areas in each district. In Cuttack district, the area under double crop in 1922-39 was about 16 percent and in Puri, it was 19 percent. The area under double crop was negligible in Balasore it varied from 1.1 percent to 3 percent during the same period.

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68 The popular varieties of paddy were namely Tulsifala, Kalajira, Samudrabali, Balasori, Parbatakanya, Champaiaisli, and Dadkhani. See Letter no. 118, dated 26 February, 1912, from Asst. Manager of Kanika Estate to the Collector of Cuttack, Kanika Tahsil Records, Accession no. 199, (O.S.A.)


70 Ibid., Agricultural Statistics of Orissa for the years from 1936 to 1939, pp. 1-5.
Out of the three varieties of rice, winter rice was the most important of all crops as this crop not only covered the largest area but also almost all the agriculturist participated in the cultivation of this crop. Cultivation in open fields required group participation without which it was difficult and not a practical proposition to venture for a crop, which was not a general practice in the locality. To prevent damage from cattle and other animals the watching of crop was necessary. Unless the raiyats combined to grow similar crops, it did not pay any individual to start one that was shown, grown or matured at a time earlier or later than the others. As there was no association or combination among the tenants, any innovation could only be introduced with difficulty. This was the reason why the autumn and summer rice was not cultivated to the extent winter rice was cultivated. Moreover, rice cultivation depended largely upon the rainwater and water from rivers and canals where such facilities existed. However, the constraints of supply of water during the autumn or summer season was one of the factors that also prohibited the cultivator to take the risk of double cropping.

Winter rice was classified into laghu (light) and guru (heavy) according to the amount of water it required. The laghu paddy was grown on moderately low lands, which were wet or covered with six

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71 This was observed by James H. Taylor, Assistant Settlement Officer-in-charge, in Report on the Khurda Settlement of 1897-98, Part-I, op. cit., p. 14.
inches to a foot of water from June to October, while *guru* paddy was
grown at a lower level. The rice fields varied in size ranging from small
plots covering one twenty fifth of an acre to large fields covering an
acre of land. They were enclosed on all four sides by small ridges
called *hira* about a foot on height and breadth that kept the plants wet
and protected it from loss of moisture.\(^{72}\)

The method of cultivation in colonial rural Orissa was almost
the continuation of the earlier practices, which the cultivators had
developed out of their own experience. During the British rule there
was no such noticeable attempt made to bring any change\(^{73}\), in the
method of cultivation. Although there were introduction of new seeds,
iron ploughs, improved manure etc. these were not popular among the
majority of the cultivators who preferred to continue with their
traditional methods. The introduction of green manure like *dhaincha*
became popular but its use was not widespread. Cow dung remained
as the most important manure that all the cultivators used in their

\(^{72}\) Ibid.

\(^{73}\) The Government distributed various kinds of seeds, either new or improved
through the District Agricultural Association and the Zamindars. These seeds did not
always give good results because these seeds were tested in different soils in
Calcutta or in the Agricultural Firms and Research Centers in Bihar and Orissa. As
we have discussed in the soil section, there was different kind of soil even within a
same region whose properties were very different. This is evident from a letter from
the Raja of Kanika who complained that the *papaya* seeds that he requisitioned from
Calcutta did not germinate in his estate. See letter no. 253, dated 14.5 1907 from
R.N. Bhanja Deo, Raja of Kanika to the Secretary Orissa District Agricultural
Association, Cuttack, in *Kanika Tahsil Records*, Accession No. 166, Orissa State
Archives (O.S.A.); Letter dated 19 October 1925 from Deputy Collector Cuttack to
Proprietor of Kanika Estate, regarding despatches of Patato seed for experimental

42
fields.\textsuperscript{74} Even in experimental farms, cow dung was extensively used as fertiliser. \textsuperscript{75} The land was ploughed as often as the weather and the resources of the cultivator permitted. Four or five ploughings were considered sufficient. The soil after being turned up was exposed to the action of the sun and the wind. Those lands that were beyond the reach of the fertilising river silt were manured. The cultivator then waited for the monsoon showers in May or June to sow seeds in the fields. Much of the harvesting depended on the water supply especially the rainwater. If the rainfall was normal during the beginning of the cultivation, it helped in proper germination of the seed and growth of the young plants. However, any deficiency or excess of rainfall disturbed the process. During the latter half of June or first half of July the growth of the rice plant was helped by the monsoon rains. During the rest of July and August when the plants had attained a height of 9 to 12 inches, there was the important operation called \textit{beusan} (literally meant changing of place). This operation was done by driving the plough through young rice plants in order to thin them and aerate the soil. In case of too severe thinning, the gaps were filled up by transplantation from thicker parts of the field. The ridges (\textit{hira}) enclosing the fields were then finally strengthened, the grass cleared

\textsuperscript{74} \textit{Utkala Dipika}, 7 October, 1876.

away from them, and the weeds removed. For these operations, an ample supply of water was necessary and if this was available and there was sufficient rainfall in September and October, a good harvest was secured in November and December.76

The success of the winter rice depended upon a very favourable weather at the time of transplantation as well as for the growth of the plant. Irregularity of rain, uneven rainfall or failure of rain often led to the unsatisfactory out turn of the crop.77 Nearly all the winter rice in Orissa was sown broadcast. Transplantation system of cultivation was not popular because the transplanted seedlings were very delicate for the first month and liable to injury by flood or by drought. Therefore, the transplanted rice covered only four percent of the cultivated area. In the transplantation system of cultivation the seeds were sown either wet or dry in a nursery, which was generally a field near the village well manured and fenced to keep off the cattle and other animals. The land was carefully watered, and when the seedlings were a month old, they were transplanted in to the rice-field. The later was prepared by ploughing and manuring in the same way as for broadcast rice, by puddling before the young plants were planted. The seedlings were arranged in bunches of three or four plants with a small space between each bunch. The roots were carefully imbedded to the depth

77 Kailaspati Narayan, Bihar and Orissa in 1935-36, Patna, 1938, pp. 119-120.
of a couple of inches. They were then left and required no further attention beyond a good weeding and a copious supply of water. The earlier the transplantation was done, the better the results, and the proper time was considered to be from the middle of June to the middle of July.\textsuperscript{78}

\textit{Beali} (autumn rice) which depended mostly on rainwater got setbacks when there was scanty rainfall in June and August. In case heavy rain came in August and September, the same crop was damaged.\textsuperscript{79} The \textit{bhadoi} crops were affected by drought and unsatisfactory weather conditions and due to increased cultivation of sugarcane crop in the 1930s, which occupied the land for quite a longer period.\textsuperscript{80} The \textit{bhadoi} crops in 1914-15 were unfavourably affected due to heavy rains and flood.\textsuperscript{81} This situation continued almost every year or in alternative years throughout the period under study.\textsuperscript{82}

The autumn rice (\textit{beali}) was always sown broadcast. Its importance was next to \textit{sarad} rice. There were two main classes of \textit{beali} i.e. the early variety, called \textit{sathika}, which matured in sixty days from the date of sowing and the \textit{bara dhan} ripening a month later.

\textsuperscript{78} N.N. Bannerjee, op.cit., pp. 64-74, \textit{Cuttack District Gazetteer}, op.cit., pp. 84-85.

\textsuperscript{79} Ibid., p.120; \textit{Season and Crop Report}, 1939-40, op.cit., p. 1.


\textsuperscript{81} Season and Crop Report of Bihar and Orissa for 1914-15.

\textsuperscript{82} Kailaspati Narayan, op.cit., p. 119.
Both the varieties were grown on the higher lands of the villages, and preferably in a light loamy soil, they were sown and reaped in the rainy season. *Beali* was liable to destruction by heavy floods early in the season. When the *beali* was damaged by deficiency of rain or by inundation, and there was no time for re-sowing, the lower lands were sown with *sarad*, which with seasonable rainfall gave a good harvest compensating the loss suffered by *beali*. Similarly, when the *sarad* crop failed due to drought, a bumper *beali* crop partly compensated the loss. *Beali* rice was followed on high lands by pulses, generally *kulthi* or *birlhi* and on alluvial or homestead lands by mustard and linseed. In rich soil under irrigation or in favourable seasons, *laghu* paddy was transplanted to the lands from which the *beali* was harvested.83

*Dalua* rice was a coarse variety of rice, which was grown in the Kharsua and Brahmari estuaries, on low swampy grounds, and on lands too heavily water logged to yield *sarad*. Clay lands subject to tidal inundation were commonly chosen for the purpose, as irrigation was easy and the crop was not affected by saline water. It was sown in winter, reaped in the spring, and therefore required constant irrigation. Canal water was utilised for the purpose where such facilities were available, but elsewhere it required no artificial irrigation as the plantation was done along marshes and tidal waters where a

natural supply of water was generally available. The crop was either transplanted or broadcast, but the transplantation was more common. It ripened in March or April and harvested soon after. The area covered by it was not large, and was more or less confined to selected low-lying lands in Cuttack and Puri districts.\textsuperscript{84}

(ii) \textbf{Serials and Pulses:}

After rice, the most important cereal cultivated was \textit{mandia} or maize. It was a cereal with small reddish grain, grown on high, light and inferior soils that were not suitable for \textit{beali}. Sometimes it was sown broadcast in May, but more often it was first sown in seedbeds and then transplanted in June. It ripened in August and September. The yield per acre of this crop was about 6 to 8 \textit{maunds} of seed to the acre. This was ground into flour and eaten with cakes and rice by the lower classes and the poor.\textsuperscript{85}

Wheat was grown to a small extent on upland fields after rice and generally on loamy or silt-covered soil. It was cultivated in Cuttack district (about 1112 acres in 1937-38) and to a very small extent in Puri districts (about 34 acre in 1937-38).\textsuperscript{86} In Balasore district, it was not cultivated, as the cultivators were not interested to grow wheat.

\textsuperscript{84} Ibid.

\textsuperscript{85} It was said to have the merit of producing such a feeling of satiety that after a full meal, a man was not inclined to eat again for 24 hours.

\textsuperscript{86} \textit{Agricultural Statistics of Orissa for 1937-38}, p. 3.
because of their ignorance and fear of loss. It was sown broadcast in October or November and was reaped in April. As a rule it was left to grow up as best as it can. Barley was grown on light sandy lands, especially in areas exposed to inundation, and occupied the land from November to March.

(iii) Other food grains:

Other food grains, including pulses, were produced on a limited scale. After rice, the people depended on the pulses sown in autumn and harvested from January to April. Kulthi was the commonest among the pulses and the least valued grain grown on poor lands after mandia and early rice crops or on higher sandy land, which produced no other crop. The kulthi seed that looked like a dark flat pointed bean made an excellent food for cattle and horses. Poor people often consumed this because of its low cost. It was also boiled and eaten with rice by the poorer classes, and was even taken alone in times of scarcity. Biri a more valuable pulse grown after beali rice where the land was rich enough, and was found chiefly in the inundated areas. It's dried seed leaves were given to cattle and it was also eaten as dal. Muga was another pulse like biri, but costlier than the later, was

87 See Abstract of Report regarding the required quantity of Wheat and Cotton seeds etc. of Kanika Estate, April 1921, in Kanika Tahasil Records, Accession no. 252 (O.S.A.)
88 N.N. Bannerjee, op.cit., pp. 74-80; Cuttack District Gazetteer, op. cit., pp. 87-90.
89 Interview with Balaram Parhi, (80), Bhadrak, January 1998.
largely consumed by the well off classes. Though not so general, in its distribution as *biri* or *kulthi, mung* was the commonest *rabi* crop grown on *sarad* lands. Another special category of pulse was *harar*, which had two varieties. The *deo* or *nali harar* grown on homestead lands and the *chaita harar* raised on riverside land after *beali* paddy.\(^90\)

**(iv) Oil seeds and Tobacco:**

Of all the oilseeds, mustard and rape were largely cultivated. Mustard was grown on rich loamy soil after a crop of rice. It was common in western part of Cuttack district. It was one of the most valued of the *rabi* crops and its oil was used for anointing and cooking purposes. Til or gingerly and castor oil plants were also cultivated.\(^91\)

Tobacco plant commonly called the *dhuanpatra* or smoke leaf was another most valuable cash crop grown in a limited extent in all the three districts. As it required a rich loamy soil and sufficient water, it was raised on rich silt-covered lands, on the banks of rivers. The finest leaves were obtained on a sandy sub-soil with a thin covering of pure silt. The profits of tobacco cultivation were very large. However, it was not possible for one man to cultivate more than a quarter of an acre, owing to the hard work it required. People having large areas fit for tobacco cultivation used to sublet them.\(^92\)

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91 Ibid.

92 *Utkal Dipika* (Oriya Newspaper), 18.2.1911.
(v) **Miscellaneous Crops:**

Sugarcane required a loamy soil and was grown generally on lands near the village and within easy reach of canal water, or on the edges of natural water-courses. It was a crop requiring incessant attention and involving a large expenditure of time, labour and money. The fields required heavy ploughing by about 30 times and rich manure before the cuttings were planted in January and February. Then constant irrigation was provided with manure at the roots of the plants. These processes were repeated at intervals, the land being irrigated to keep it continually moist. After the fourth application of oil cake in May or June, the soil was loosened by the plough. Finally, in December, the canes were cut down and the juice was extracted. The crushing was generally done by means of a country made mill with three iron-rollers worked by bullock power.  

Cotton and jute were two important fibre crops generally grown on homestead lands, which had access to water from tanks or village ponds and canals, or on rich alluvial soil by the riverside. The cultivation of jute was mainly confined to the irrigated area in central Cuttack and Jajpur, and to some extent Kendrapara and Kujang in Cuttack district and also in homestead river and canal side lands in

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93 Ibid.
Balasore and Puri districts. The tenants paid extra rent for the
cultivation of these cash crops.\footnote{Ibid.}

The cultivation of betel leaves or \textit{pan}, the leaves of which were
used to wrap up the \textit{supari} and other pan \textit{masala} chewed by Indians
of all ranks and classes, was not very extensive in Orissa. The finest
\textit{pan} was cultivated at Barkud in the Kujang estate and in Kendrapara
sub-division in Cuttack district. There were also valuable gardens in
Kodinda close to Cuttack and in the Jajpur Sub-division as well as in
other parts of Cuttack district. In Balasore district \textit{pan} was grown
largely in Bhograi and in the neighbourhood of Bhadrak. It required
most careful cultivation and gave large profits. The average life span
of one \textit{pan} garden was around 18 years\footnote{It was estimated that \textit{pan} plant grows to an unmanageable height within 18 years,
which necessitates its abandonment.} after which it was
abandoned and a new garden was prepared.\footnote{In Balasore District \textit{Pan} was Cultivated largely in Bhograi, Baliapal and in the
neighbourhood of Bhadrak, See, N.N.Bannerjee, \textit{op.cit.}, pp. 74-80; S.L. Maddox, \textit{op.
cit.}, pp. 46-47; W.W.Dalziel, \textit{op.cit.}, p. 12.}

\textbf{(vi) Vegetable and Fruits:}

The most important of the garden crops was the brinjal or
\textit{baigun} and its cultivation was very general. \textit{Saru} (a tuber) was very
largely cultivated in the homestead lands and consumed by the people.
Onions were common and cucumbers of many kinds were grown in
homestead lands. Pumpkins were also generally grown. Nearly every
cultivator had a plant in his homestead, and these were raised on a larger scale on sandy riverside lands. The cultivation of potatoes was popular particularly in the Cuttack district. Improved potato seeds were introduced from Patna. The most popular fruit was the plantain, which was eaten as a fruit and with curries and like the brinjal, it formed the basis of most of the vegetable curries. Mangoes grew freely which formed a very valuable addition to the food of the people during the hot weather, though their quality was inferior to the Malda and Bombay varieties. Pineapples were grown in many villages but were not sufficient to form a very valuable article of food. Among other fruits were the bel, jack, tamarind, Indian plum, bananas and papaya. Spices, turmeric, chillies, coriander and ginger were used largely in cooking, but were cultivated in a small scale to meet the local demand.

III. FORESTS AND PASTURES:

(a) Forests:

The forest area in the district of Cuttack was 278,629 acres in Puri district it covered 303,278 acres and the district of Balasore had no forest area. The proportion of forest area to total area was 9.6 per cent in Cuttack district and 19 per cent in Puri district. The

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97 Utkal Dipika, 16.9.1911.
98 Ibid.
Government forests in Orissa Division were confined to the districts of Puri, Anugul and Sambalpur. The Forests in Cuttack district fell in the permanently settled areas and hence were under the supervision of the proprietors of the estates. Besides this, there were extensive forest areas in the Tributary States of Orissa, which were supervised by the Agency Forest Officer under the control of the Political Agent and Commissioner of Orissa Feudatory states. Large tracts of countryside in coastal Orissa practically had no forests and the people mostly depended, for their supply of timber, upon the tributary states. In many places, hillsides became uneconomic to cultivation owing to the erosion of the soil.\textsuperscript{100}

In 1833, the forests were placed under the Forest Department, and a forest settlement was carried out. In protected forests, the revenue-paying raiyats were allowed to exercise a number of privileges such as grazing their cattle and cutting bamboo and trees. In the unreserved forests, permission was given for using the forest for making their houses, agricultural implements etc. and allowed to cultivate any parts of the protected forests before such parts were properly leased to them. They were also required to pay grazing fees for cattle in excess of the numbers supposed to be necessary for

\textsuperscript{100} Government of Bihar and Orissa, \textit{Report on the Administration} of Bihar and Orissa, 1911-12, op.cit., p. 17.
ploughing and manuring their fields. Cesses were levied for granting permission to remove unreserved trees for firewood etc.\textsuperscript{101}

Before 1870, no restrictions were imposed on the cutting of trees, and the main idea seems to have been to extend cultivation as far as possible. But in 1871 the sub-divisional officer of Khurda drew attention to the fact that the forests were being destroyed by the raiyats, and others, and efforts were made to stop this destruction. Restrictions were imposed on the removal of certain kinds of forest produce and the practice of temporary cultivation. Inspite of this the conservator of forests reported in 1881 that the forests were in a deplorable condition. The unsettled lands in the Khurda estate was declared protected forests in 1880 and this area was taken over by the Forest Department in 1883, reserved blocks being notified during 1995, 1886 and 1891. From 1883 to 1895 forest conservancy, including protection from fire in the reserves was established.\textsuperscript{102}

In 1911-12, there was a change in the forest policy in which reserving forests were seen as the only solution of the problem of maintaining forests. Forest settlement proceeding were carried on in Puri district and partly in Sambalpur district with the object of covering as much as was possible of the protected forests to reserved forests. In districts where such conversion was not immediately done

\textsuperscript{101} Statement of Mr. A.L. McIntire, Conservator of Forests, Bengal, quoted in Puri District Gazetteer, op. cit., p. 154.

\textsuperscript{102} Ibid, p. 154.
the protected forests served as useful, through temporary, purpose in retarding the rapid destruction of the forest and in providing grazing areas. With effect from 1 April 1912 separate forest divisions for Puri, Sambalpur and Anugul were formed which remained under the forest circle of Bihar and Orissa. All those divisions had increased number of Forest Guards. Around 1926 the protected forests in Puri were divided into three ranges, viz. the northern range with headquarters in Chandaka, the central range with headquarters at Khurda, and the southern range with headquarters at Balugaon.103

The government introduced Sal regeneration by group felling, and the burning of the under grown plants which promoted reproduction. Dense forest growth remained in remote places and because of their distance from the villages, it was inconvenient for the raiyats to use its wood.104 The casurina plantation, which was termed as a reserved forest was entirely distinguished from other reserved forests of the Puri district. In 1912 the land was acquired on the sandy barren strip along the seacoast to the east of Puri town. The object of the plantation was three fold i.e. to form a barrier to the sand, which was otherwise continually blown inland by sea breeze and damaged crops and houses in the interior, to provide a fuel supply for the Puri town at a low-cost and to provide reservoir sites free from

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103 Report on the Administration of Bihar and Orissa, 1911-12, op. cit., p. 17.
contamination for the supply of water to the town of Puri. Though these trees, which grew in barren or wastelands, were planted by private landlords, there were no plantations of any big size except those planted by the Government.\textsuperscript{105}

Forest areas were classified into two categories i.e. reserved and protected. Reserved forests were generally subject to few or no rights of the user, and were managed for the production of the greatest yield of timber and fuel that was compatible with their preservation and maintenance. Protected forests had rights of user for timber, fuel and grazing by villagers in the vicinity, which was not compatible with the preservation of forests. Therefore, the government from time to time introduced stringent regulations and took measures to protect the forests from fire and grazing was not permitted except under inalienable rights or in special circumstances.\textsuperscript{106}

Under the forest management programme, such as the production of sustained yield of large timber to meet market requirements and the production of small timber firewood and other produce to cater to local needs, a number of prescribed systems were formulated for the reserved forests. In the northern and central ranges they were exclusively worked, according to the nature and


\textsuperscript{106} Ibid., pp. 28-29.
condition of the standing crops on a rotation of 30 years. In the southern range where the composition and condition of the crop varied, a number of systems were introduced such as sal regeneration, selective felling of trees, felling cycle of 30 years and teak plantation working circles, comprising annual plantings with thinning in existing plantations.107

The Puri Forest Division, except the casurina plantation along the sea-coast near Puri town, was entirely within the Khurda subdivision and consisted of reserved and protected forests extending over 474 square miles. The reserved forests of Khurda consisted of separate demarcated blocks with an area of 120 square miles, while the protected forests comprised the unsettled wastelands scattered all over the sub-division without proper demarcation. It covered an area of 354 square miles out of the total area of 1013 square mile of the subdivision. With the exception of a few small blocks on level ground, the forests of the sub-division were on hills varying in elevation from 500 feet to 3000 feet.108

The Khurda forests were within what was technically known as the dry evergreen forest zone. For general purposes it was classified under two main division i.e., sal forests in which sal predominated and mixed forests in which sal was not the prevailing species. In sal

forests, *sal* formed practically pure forest, while in other forests asan, *rai*, *kendu*, Kongra and *sidha* trees were found.\(^{109}\)

The *sal* forest was seen at its best in the metamorphic region to the south-west of the Division, where trees three to five feet in girth and sixty to eighty feet high are found. Besides the *sal*, there were other important trees found in the *sal* forest such as *kumbi*, *charo*, and *piasal*. The species of bamboo known as *kantabansa* was found more frequently in low-lying localities. The mixed forest varied from place to place, being nothing more than a low scrub-jungle in some places, while in others it was a good height forest. The chief timber trees were *sal*, *asan*, *kongra*, *tina* and *piasal*. Firewood and charcoal were obtained from a large variety of trees. There were no minor products of strictly local importance except perhaps edible fruits, such as mango and jack. *Kamalgundi* powder was obtained from the fruit of *gundi* trees on their leased lands and sold it either to the Forest Department or to traders in Ganjam, where it was used for dyeing purposes. Nuxvomica seed, which was used for preparing some medicine, was collected by the Forest Department and was generally purchased by traders from Cuttack. Other minor products were *harira*, and *bahara* seed and *sunari* bark which were used for tanning.\(^{110}\) The forest of the Puri division also contained a large

\(^{109}\) Ibid.

\(^{110}\) Ibid.
number of *kuchila* trees scattered throughout the protected forests.\(^{111}\) This was a valuable seed used for medicinal purposes and had a good market. Bamboo which was common in most forests were used for building, basket making and innumerable other purposes.\(^{112}\)

**Conflict over right to timber and tree products:**

The Zamindar had the sole right in his *hastabud* villages to the sale of timber on uncleared lands, but the resident tenants have in general a perspective right to take for their own use firewood in scrub jungle, and grass for thatching, and to graze their cattle upon some or all the waste lands of the village. In most estates, this right was admitted. The Zamindar was primarily the owner of every timber tree on his estate.

The land given by any superior authority in revenue free or *tanki* grants, or sold to them from a *kharida* tenure, were absolutely alienated from his estate- It was therefore, found that *lakhrijdars*,\(^{113}\) *bazyafidars*, *tankidars* and *kharidadars* were sole owners of all trees on their lands. However, the ordinary raiyats did not have such

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\(^{113}\) In Chapter III we have elaborated various tenurial system in Orissa during the British rule.
rights. Although the tree was planted by him on his own holding he was but a part owner.\footnote{S.L. Maddox, vol. I, op.cit., p. 237.}

Custom varied from respective rights of landlord and tenant from district to district, from \textit{pargana} to \textit{pargana}, and even from village to village. During the settlement operations of 1897 the customary rights of raiyats were found out and recorded district wise. For example, in Cuttack district all raiyat could cut bamboo, canes and non-timber trees standing on their holdings. However neither the Zamindar nor the raiyat could cut down the tree on a \textit{thani} land without the other's consent and when the tree died or was cut down each was entitled for half the wood. \textit{Pahi} tenant had no right whatever in the wood of a tree on his land unless planted by himself, in which case he was generally considered a half owner.\footnote{Ibid.}

The principal variations found were that in some villages where tenants were strong and the landlord weak, absentee, or indifferent, trees were cut down by \textit{thani} raiyats and the whole wood appropriated without the Zamindar's consent, such practice was only found in a few villages and was nowhere admitted by the Zamindars as the tenant's right. In many estates it was customary to take a rent or half the produce before allowing a \textit{pahi} riyat the fruits of trees on his land. However, it was more common for the Zamindar to take only a small
present of fruit as the price of his formal consent to the tenant to take
the remainder. In many cases it was also found that the Zamindar
took rent for all the trees planted by the raiyats or particularly the
fruit-trees. In some villages it was customary, when a tree fell even on
a pahi holding, to allow the raiyat a quarter or half the wood, but this
was rare and rather a matter of grace than of right, unless the tree
was planted by the raiyat.116

Maddox observed that where the Zamindar or tenure holders
were strong, they maintained the old custom which necessitated the
obtaining of their permission to cut trees. They insisted on getting the
whole or a share of the produce of trees standing on the pahi lands.
But where the landlord was weak or an absentee and the raiyats
wealthy or powerful (especially the thani raiyats) they exercised full
rights to plant, enjoy and cut trees.117

(b) Pasture lands and grazing rights:

During the Provincial Settlement in 1897, Assistant Settlement
officers were directed to select in each village a few large fields, no
more than 15 to 20 acres in an average village of 400 acres, suitable
for grazing and to enter them in a separate khatian called
(sarbasadharan) to which they were required to get the signatures of
some of the leading raiyats and the landlord or his agent. Similarly,

116 Ibid
117 Ibid.
plots actually used as cremation grounds and tanks were also entered in this *khatian* of reserve land.\textsuperscript{118}

However, the question of legislation for Orissa to preserve grazing grounds and other communal lands from encroachments came up in the Orissa Tenancy Bill of 1912 and chapter XA of that Bill was passed inspite of opposition. This chapter was in the Original Bill of 1913 but was deleted by the Select Committee mainly on the ground of criticism of the suitability and accuracy of the entries made in *sarbasadharan* portion of the record of rights. From the debate, it was clear that there was general sympathy for reservation of adequate amount of wasteland for grazing. But as it was a question of limiting the landlords right in uncultivated lands even in the temporarily settled estates, which obviously brought opposition from them and the Government was pressurised to delete that chapter XI from the Orissa Tenancy Act of 1913.\textsuperscript{119} Moreover, under Chapter XI of the Orissa Tenancy Bill, power was given to the revenue courts to evict trespassers from communal lands.\textsuperscript{120} However, this chapter was omitted from the Orissa Tenancy Act when it was passed in 1913

\textsuperscript{118}Ibid.

\textsuperscript{119} See letter no. 1315 RR, dated 14 September 1926, from W.H. Lewis, Officiating Secretary to the Government of Bihar and Orissa to the Secretary Board of Revenue, Bihar and Orissa, in Government of Bihar and Orissa, *Revenue Department, Land Revenue Branch*, B Proceedings, no.102-113, September 1926, pp. 1-2.

\textsuperscript{120} It may be mentioned that these powers have been conferred in the Central Provinces Land Revenue Act, and it was obviously desirable that the revenue courts should have possessed these powers if communal lands were to be effectively preserved for the village community.
allegedly because of the inaccuracy of the *sarbasadharan* Khatian (Register of Village Common Lands).  

In Bihar and Orissa Legislative Council a resolution was moved by Thakur Hari Shankar Singh, on the 18th February 1926, recommending that necessary steps should be taken for providing sufficient pasture land in each village and to take necessary legislation to give effect to it. When replying to the question raised by Thakur Hari Shankar Singh in the Legislative Council Mr. Collins, on behalf of the Government, drew attention to the difficulty of setting aside grounds for cattle in intensely populated and highly cultivated districts, where practically all available waste land was already under cultivation. He added that in response to the strong feeling on the subject which undoubtedly existed, Government was prepared to have enquiries made by revenue officers to be placed on special duty for the purpose who would examine the settlement records and make a

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121 See letter no. 1315 RR, dated 14 September 1926, from W.H. Lewis, Officiating Secretary to the Government of Bihar and Orissa to the Secretary Board of Revenue, Bihar and Orissa, in Government of Bihar and Orissa, *Revenue Department, Land Revenue Branch*, B Proceedings, no.102-113, September 1926, pp. 1-2.

122 The grazing fees were charged by many zamindars. In permanently settled estates levy of such fees was quite common. Those who failed to pay the grazing fees were penalised by the zamindars. For instance in Kanika Estate there was a practice to realise double pasture fees from the defaulting persons who failed to pay the grazing fees in due date. This double fee was also levied in order to prevent the tenants in the *Raj Sarkar* (Estates) land. See Note of Manager Kanika Raj submitted to the Raja Of Kanika on Pasture fees, in *Kanika Tahasil Records*, Accession no. 354 (O.S..A).
detailed report on the position as regards the grazing grounds in various divisions in the province of Bihar and Orissa.\textsuperscript{123}

During the revision settlement of 1922-32 in the temporarily settled estates in Orissa the landlords did not object to certain areas of waste land being recorded as reserve for grazing for the period of the settlement i.e., 30 year.\textsuperscript{124} In this settlement, detailed instructions were given to Asst. Settlement officers to record grazing lands in every village to the minimum extent of 5 percent of the total area after local enquiry and taking the consent of the landlords. There was a considerable difference of opinion whether the Government policy should be to encourage extension of cultivation or to limit it to keep sufficient area for grazing and fuel reserves. Though the district level officers favoured the latter option, yet in practice this was not followed.\textsuperscript{125}

During the settlement of 1922-32, lands were set apart by the settlement authorities for grazing and communal purposes and entered in a separate (\textit{Sarbasadharan} Khatian).\textsuperscript{126} All proprietors

\textsuperscript{123} Government of Bihar and Orissa, \textit{Legislative Council Proceedings}, 18 February 1926.

\textsuperscript{124} See letter no. 1315 RR, dated 14 September 1926, from W.H. Lewis, Officiating Secretary to the Government of Bihar and Orissa to the Secretary Board of Revenue, Bihar and Orissa, in Government of Bihar and Orissa, \textit{Revenue Department, Land Revenue Branch}, B Proceedings, no.102-113, September 1926, p. 3.

\textsuperscript{125} Ibid.

\textsuperscript{126} Ibid.
engaging for the payment of land revenue bound themselves under the terms of their kabaliyat to preserve these lands for communal purposes and to take no rent or grazing charges. For this reason the lands were exempted from land revenue assessment. The total area of lands entered as grazing grounds at the 1922 settlement was 106,200 acres. In permanently settled and revenue free estates the same procedure could not be adopted, and pasture lands unless so recognised by customary right (and apparently there were none of these) could not be so recorded without the consent of the proprietors.\textsuperscript{127}

To sum up, as the people were mostly agricultural, their wants in the way of forest produce were chiefly bamboo, fuel and small timber for house making, and agricultural implements. However, they had no right on the Reserved Forests. Although the protected forests were opened to the people to meet their requirement, it was subject to the adherence of specified rules and payment of forest cess to the Government. These rules and fees discouraged the people to depend upon the protected forests. In addition to that the control of their right to trees in their village land by the zamindars\textsuperscript{128} created discontentment which gave rise to agitation demanding increased

liberties to use the forests and right over trees. Moreover, as Madhab Gadgil and Ramachandra Guha emphasise 'the loss of forests and pastures, earlier communally owned and managed, severely undermined the subsistence economy of the peasant'.

II

IV. RIVER, EMBANKMENTS AND IRRIGATION:

(a) Rivers:

The Cuttack and Puri districts were intersected by many streams almost all of which had their origin from the three great rivers, i.e. the Mahanadi, the Kathajuri and its branches. The Baitarani formed the boundary between the Cuttack and Balasore districts. In the Balasore district the principal rives were the Matai, Burabalang, Panchpaa and Subarnarekha. Of the five major rivers in the three districts i.e., Mahanadi, Brahmani, Baitarani, and Burabalang and Subarnarekha, the rivers Subarnarekha and Burabalang in the district of Balasore had comparatively short courses.

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129 The peasant movement in Orissa that became more organised after the mid-1930's raised their voice against the government policy on forests and trees. See Proceedings of the Puri District Peasant Conference held on 19.5. 1939 in Government of Orissa, Home Special Section, F.No. 189/1939. This is further elaborated in Chapter VI.


between the hills and the sea. However, the first three rivers i.e., Mahanadi, Brahmani, and Baitarani formed the principal river system in North Orissa.

One of the earliest British narratives on the geographical and ecological details of the Orissa delta was given by Andrew Stirling who noted its most striking characteristics as-

The whole of the *mogulbandi* between the Chilka lake and the Brahmani river was peculiarly subject to inundation from its proximity to the hills, and the astonishing rapidity with which the torrents descend in the rains; the strange conformation of the channels of some of the principal rivers, which are very broad within the hills, but divide soon after leaving them into a number of narrow streams; and also from the practice which has existed from very old times of using embankments.¹³³

These rivers were the lifelines of the agrarian population of Orissa. The water from these rivers was a major source of irrigation. However, when there was excess of water in these rivers it inundated to the fields and villages that caused heavy damage to the crops, and even led to the loss of population.

(b) Embankments:

The coastal districts of Orissa were subject to inundation due to the over flowing of embankments after torrential rains which did considerable damage to crops.¹³⁴ Therefore, the question of regulating

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the floodwaters of rivers and its streams and canals occupied the attention of the colonial rulers.135 The colonial government undertook the repair, maintenance and construction of some old and new embankments. Repeated floods reminded the government to undertake the protective works more vigorously. Many exercises were made to have a clear distinction of the responsibilities of the Zamindars and the Governments for maintenance work. To improve the system many old embankments were abandoned and new embankments were constructed. Inspite of all the good attempts taken by the Government and the Zamindars the flood problem continued to demoralise the peasantry. This was evident from the recurrence of floods leading to severe damage of crops throughout the period under study. Based on the available data it may be observed that the embankment policy of the Government had its own limitations. Sometime it was the economic motive136 or lack of funds which deterred the Government to proceed with a full network of

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135 Letter no. 2372, dated 13 September 1956 from Colonel H. Goodwyn, Chief Engineer, Lower Provinces, to the Secretary to the Government of Bengal, Fort William, in Correspondence regarding General State of the Distribution of the floods in the Puri and Central Cuttack Districts, pp. 4-7. (Government of Orissa, Irrigation Department Library, Bhubaneswar).

136 The officials explored the possibilities of recovering the cost of embankments in Orissa. See Letter No. 37, A.T. Dated, 10 October 1902, from Secretary, Board of Revenue to the Secretary to the Government of Bengal, Revenue Department, in Appendix to the Irrigation Manual of the Irrigation Branch of the Public Works Department of the Bihar and Orissa Government, Superintendent Government Printing, Patna, 1917, pp. 138-142.
protective embankments which would have brought agrarian prosperity to an already backward peasantry.\textsuperscript{137}

In 1866-67 Mr. W.C Taylor, Deputy collector in charge of the Orissa Embankments, initiated a detailed investigation on the embankments in the Orissa division. His search depended on the scrutiny of settlement records, local inquires and the listing of the embankments on a map. The objective of the investigation was the need to define the various liabilities of the Zamindars and the Government towards the maintenance and repair of the embankments. Taylor reported that there were about 510½ miles of Government embankments and 248 miles of the Zamindari Embankments in Cuttack district. Most of the Zamindari embankments that were originally constructed were of insufficient height and section to withstand heavy floods remained mostly useless because of their low height. He suggested the construction of another 498 miles to complete the system and recommended for abandonment of some embankments. But his proposals were not accepted.\textsuperscript{138}

\textsuperscript{137} For instance in 1913 the proposal for construction of a protective embankment at the Banki Government Estate in the Mahanadi in Cuttack District was dropped because it was not financially viable as it was then estimated to cost one and a half lakhs of Rupees. On the other hand the local officers were instructed to construct low embankments across the ghais to exclude the sand as far as possible. See note of J-C B. Drake, dated 22-9-1913, H. McPherson, 23. 9.1913, and E. Levinge, 1.10.1913, and C.A. White dated 24.10.1913, in Government of Bihar and Orissa, \textit{Revenue Department Land Revenue Branch, A Proceedings}, nos. 29-31, January 1914, pp.2-3.

In 1881 the Government decided to maintain the embankments as they were until the expiry of the settlement proceeding. In 1894 C. Odling, the Chief Engineer of Irrigation prepared a complete list of embankments that were to be maintained and abandoned. He divided them mainly into the following four categories.\footnote{139}{Ibid.}

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, which were to be abandoned in future.
Class III- Embankments in this class were maintained simply because they were supposed to be of any real use to the country. Although these embankments provided some partial protection in some places yet their utility were questionable.
Class IV- Embankments in this class were the old embankments which were either abandoned or replaced by new ones.

With these categories, Mr. Odling proposed that out of the 969 miles of embankments, 372 miles were to be abandoned and 597 were to be retained. In 1896, the Government made further enquiries on the embankments with the intention of phasing out which it called the “superfluous embankments”.\footnote{140}{See Letter No. 37, A.T. Dated, 10 October 1902, from Secretary, Board of Revenue to the Secretary to the Government of Bengal, Revenue Department, op.cit., pp. 138-142.} Because of this enquiry Mr. Odlings suggestions were considerably altered.\footnote{141}{Ibid.}

There was a major shift in the embankment policy of the Government in Orissa in the beginning of the 20th century. The policy focused on disposing its responsibility towards repairing or
constructing embankments. The Board of Revenue, Bengal, by its notification dated 25th January 1904 to the Commissioner of Orissa emphasised on certain principles that were to be adopted on the Orissa embankments. The main feature of these principles were:

1. Costly works were not necessary in Orissa and therefore no elaborate schemes of heavy expenditure were to be contemplated.
2. No material increase in the number of length of protective embankments.
3. The question of embankments should not be looked at primarily from the revenue point of view. The decision whether a work should be undertaken should depend rather on its probable benefit to the people in general, than on any estimate of its effect on the revenue.
4. Government was under no obligation to maintain or construct embankments in temporarily settled estates; but, on the contrary, was at liberty to abandon existing embankments, without granting any compensation for so doing.
5. In permanently settled estates, no new works need to be constructed except on the application and at the cost of the proprietors concerned.

However, not withstanding the fact that the colonial administration realised the importance of embankments, the problem was not so simple. As H. Mcpherson said in the Legislative

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144 See Letter no. 3802, dated 16-12-1917, from Commissioner of Orissa to the Secretary Board of Revenue, Bihar and Orissa, in Bihar and Orissa, Judicial Department, Irrigation Branch, F.No. 7 of 1917; Also see letter from W.S.Bremner, Superintending Engineer, Orissa Circle, to the Commissioner of Orissa, in Ibid. He proposed for a separate Embankment Act for Orissa but the proposal was not accepted.
Council of Bihar and Orissa in 1922: - The more you pile up embankments along the rivers courses, the greater was the disaster when you have a high flood breaking through. A great deal of the distress that was now being suffered from floods in Orissa was due to the fact that embankments have been erected in places where they are doing more harm than good.

He admitted that the problem was a very difficult one, which could be solved by experts. The expert suggestion in the assembly was given by Rai Bahadur Purnendu Narayan Sinha, M.L.C who said: - Embankments serve the purpose of irrigation and also of drainage. These two are sometimes conflicting interests and people on two sides of the embankments get conflicting interests in the matter of irrigation and drainage. Now that is a matter, which, Government with due regard to the best expert advice may take upon itself to decide and to construct necessary sluices and flood gates. Then much litigation can be avoided.

Further suggestion came from Choudhury Raghunandan Prasad Sinha, MLC who said, "Private people should be encouraged to construct and maintain embankments under government sanction
and supervision." The Government gave consent to carryout these suggestions.\textsuperscript{145}

To sum up, the early debates on the embankment policy from 1830-1850 had centred on the question of abandoning the embankments as opposed to having them retained. By the late 1860's the shift was to focus on the embankment schemes as a flood protection strategy. Nevertheless, towards the later half of the 19\textsuperscript{th} century there was a reconsideration of the embankment system, which was not considered as economically profitable and gradual phasing out of embankments, were encouraged. By the beginning of the 20\textsuperscript{th} century the policy was more or less to discourage construction of any new embankments unless it was very essential. The government then encouraged private embankments and construction of low embankments across the \textit{ghais} or flood gates.\textsuperscript{146} The construction of embankment in permanently settled estates was left to the concerned proprietor. The proprietor of the permanently settled estates got the repair of embankments done by their tenants without payment.\textsuperscript{147}


\textsuperscript{146} Ibid.

\textsuperscript{147} For instance in Kanika Estate it was a settled practice that tenants of each village would help the estate for the benefit of their own by undertaking repair of embankments, roads etc. The tenants were asked to do this work when they were free from agricultural operations. See letter (undated) from Assistant Manager of Kanika Raj to H.S. Strong, in \textit{Kanika Thais Records}, (Accession no. 206, O.S.A.).
Irrigation:

(i) Traditional Irrigation:

What was the traditional irrigation system that the cultivators of Orissa depended? From time immemorial, rainwater\textsuperscript{148} had been the natural source of irrigation. Artificial irrigation was carried on in Orissa from several sources, viz. from the large rivers through embankment sluices, from rivers by means of water lift, by damming up natural streams, from tanks, natural springs and wells. Of these, irrigation from natural sources formed an important component of the agrarian life of Orissa.\textsuperscript{149} But, unfortunately the streams with one or two exceptions were not perennial, and were not of much use for irrigation, unless the surplus water was stored in suitable reservoirs during the rains. Wells formed the least important source of supply of water; their use was very little. Only a few fields of sugarcane or country potatoes were being watered from wells, which was dug yearly for the purpose.\textsuperscript{150}

The natural supply of water from the rains and the perennial springs were inadequate for the requirements of cultivation and were


\textsuperscript{150} For the traditional irrigation system in Orissa see N.N. Bannerjee, op.cit., pp. 56-59, \textit{Pt.:i District Gazetteer}, pp. 166-163.
supplemented by tanks, and by utilising the water of the numerous drains and streams. When the later method was employed dams were put across natural streams, and the water thus headed up either allowed to flow over the cultivated area or was led to the fields by means of small channels, locally known as *pahanis.*

The tanks, which were essential components of village life in India especially in eastern India, were of two kinds. Some were tanks of ordinary kind, made by excavation, which were occasionally fed by natural springs or floodwater. Others were formed by constructing embankments across sloping land, in order to intercept the drainage of the land above. Sometimes they were artificially deepened by excavation to increase their capacity, and sometimes they were fed by natural spring, which were locally called *garhias.*

River waters had also served as the chief source of irrigation in most parts of coastal Orissa from which in times of flood, water was let out into the cultivated land through embankment sluices. The defect, of this system of irrigation was that the crops suffered from draught, if there were no floods in the rivers. In the minor drainage channels, also the earthen dams were made across the stream to head up the water, for irrigating the fields lying close to them. However, this was done to a very limited extent.
**Water lifts:**

Some irrigation was carried on by means of water lifts, mainly in the case of *dalua* crop. There were also some hot weather crops and sugarcane irrigated in this way along the riverbanks. The three commonest contrivances for raising water from a lower to a higher level were *tenda*, *sena*, and *janta*. The *tenda* consisted of two upright posts with a cross bar, which served as a fulcrum on which a bamboo pole was fitted. The Bamboo pole was weighted at one end by a stone or mass of mud, and at the other a long rope was fastened, with an earthen pot or bucket. When water was required, the bamboo was pulled down until the bucket was immersed in the water and then emptied into a pipe. The water was then directed into the fields through narrow channels. *Sena*, a sort of basket made of split bamboo, which two men handled simultaneously, was used to irrigate those fields, which were near the water level. 

Another way of lifting water a short distance was with a scoop called *janta*. It was handled by one man either directly or with the help of a bamboo crane. The limitation of this method was that the water could not be lifted more than a few feet. Sometimes all these methods i.e. *tenda* and *janta and sena* were combined together to lift water. For

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152 Ibid.
example, the water was first lifted by the *tenda* into a temporary reservoir and from there into the water-channel by a *sena* or *junta*.\(^{153}\)

**(ii) Canal Irrigation:**

**The Background:**

By mid 19\(^{th}\) century the British Government in Orissa was confronted with the problem of chalking out a practical solution to protect the people from the devastating effects of floods and droughts. Floods were more common in Orissa than drought. While floods had some redeeming features, drought brought on famines, which the Government was unable to cope with for lack of communications within the province as well as with the neighbouring provinces of Bengal and Madras. Therefore, the government thought of introducing canal schemes and their protective embankments to control and utilise the vast supply of water that came from Central India and Chhota Nagpur hills during the rainy season that rushed off to the Bay of Bengal within a few weeks, leaving the rivers almost dry during the remaining parts of the year. The canals were to extend to Bengal opening new avenues for communication and trade. By this, the government also expected a vast increase in the total land revenue of the province by irrigating the lands.\(^{154}\) However, this did not materialise.

\(^{153}\) Ibid.

The Government of India in 1858 selected Colonel Arthur Cotton to inspect the Mahanadi River and to report upon the best means of controlling its floods, and of protecting the Orissa delta from the terrible effects of flood and drought. He suggested that “Not a drop of that flood can be spared and allowed to pass off to the sea, without its loss being felt in the after year”, and “the value of that flood which when properly controlled will more than treble the revenue.” He estimated that an area of 2¼ million acres of land might be irrigated and navigation opened between Orissa, Midnapur, and Calcutta at a cost of 130 lakhs of rupees. Accordingly, the Government permitted the construction of canals in Orissa through a private enterprise called the East India Irrigation Company in 1860. This company started its work with a highly ambitious scheme for a system of canals for navigation, irrigation and protection against floods extending from Calcutta to Puri. The complete scheme as originally proposed, comprised the construction of works for navigation, irrigation and flood regulation along the coast from the Damuda river to Cuttack and from there to the south upto the Chilika Lake. The proposed works included, besides the necessary weirs, canals, distributaries, a system of very large reservoirs on the tributaries of the Mahanadi for the regulation of floods and the supply of water in the dry season. The scheme embraced four distinct but closely connected projects i.e. 1. The Mahanadi series of canals, 2. The Brahmani and Baitarani series,
3. The Subarnarekha series, 4. The Cossy (or Midnapore) series. Each series was to be connected by a high level canal, running from river to river with little or no fall, commanding a large area for irrigation as well as navigation. The East India Irrigation and Canal Company, which was formed in 1860, began its work soon after. In 1865 water was first supplied for irrigation. The canal projects were not sufficiently advanced to be of any real use in the terrible famine of 1866, though they supplied an excellent form of relief labour in the distressed districts. By 1867-68 the work was partially completed and the Company was unable to carry the work further due to financial reasons. The Government, therefore, took over the work from the Company by paying Rs.1,09 lakhs and from 1869 the Company ceased to exist. Initially the colonial irrigation network made a slow progress in Orissa. The work was geared up in 1873 when it was decided to provide for an irrigable area of 1,140,000 acres in Orissa at an estimated cost of Rs.441 lakhs. This area was to include 500,000 acres in Balasore and Puri sections of the scheme. The works sanctioned included the Taladanda and Machgaon canals, for the irrigation of the lands between the Mahanadi and the Kathjuri 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-I for the irrigation of the strip of country lying at the foot of

155 Utkala Dipika, 3 February, 1877.
the hills from Cuttack to Bhadrak. By 1874, the greater part of the scheme was completed, but collections proved very disappointing to the Government.\textsuperscript{156}

In 1884 a revised scheme was approved for the extension of the Taladanda and Machgaon canals and for the construction of new distributaries, bringing up a total estimate to Rs.3, 23,00,000 the project then approved was completed and besides this the Machgaon canal was extended to the village of Nagpur in Cuttack district. One additional canal, with a total length of seven miles, was constructed from the junction of the Baitarani and Burah to Jajpur and a number of distributaries were added. A channel, known as Dudhai Canal, taking off from the north end of the Brahmani weir, was also constructed which irrigated about 12,000 acres of spring rice in the area between the Brahmani and the Kharsua rivers. This channel was a failure and was therefore abandoned in November 1930.\textsuperscript{157}

\textbf{General plan of the Canal System:}

The canals derived water supply from the rivers and its distributaries and there were many channels, which were cut from the main channels to sub-canals for irrigating the interior fields. Near the


\textsuperscript{157} See Letter no. 11548, dated 17 December 1930, from H.C. Prior, Secretary to Government of Bihar and Orissa, Revenue Department, to Commissioner of Orissa, Embankment Department, F.No. 6-17 of 1930.
point where each river bifurcated on debauching into the plains a weir was constructed across the head of each branch, partly for the purpose of retaining the water at a suitable level for irrigation, and partly in order to distribute the flood discharge in suitable proportions between the different branches. From the planks of these weirs marginal embankments ran, if necessary, both up and down stream, so as to confine the floods to the river channels, and from the same points canals were fed, which carried water to the lands below. Provision was made by means of a network of smaller branch canals for the distribution of the water to the areas commanded. These canals, called distributaries, led the water to within a certain distance of each village, and the more detailed distribution of the supply to the lands of each village was made by still smaller branches, termed village channels.

**Weirs:**

The canal system in Orissa derived its supply from seven great weirs with an aggregate length of 3 ½ miles, which, with the canal head sluices and entrance locks, constituted one of the most extensive systems of canal head works in India. Three of these weirs controlled the huge water supply of the Mahanadi. The Naraj and Mahanadi weir supplied water to the Taladanda canal and its branch the Machgaon canal. The Birupa weir supplied water to the Kendrapara canal system and the High Level Canal Range-I. The Brahmani and
Baitarani weirs supplied water to the second and third ranges of the High Level Canal, the Jajpur canal, and to the Dudhai canal on the left of the Brahmani. However, in 1930 the High Level Canal, Range-I and Dudhai canal were abandoned and the Brahmani and Patia weirs had no utility for the irrigation works. The Orissa Flood Committee, 1928, recommended the dismantlement of the Brahmani weir in the interest of maintaining the river in its channel.

**Main Canals:**

The main canals were (1). The High Level canal, Range-III, in Balasore district; (2). The Jajpur canal running to Jajpur; (3). The Kendrapara canal, with its extension to Jambu and two branches called the Gobri Extension canal which derived water from the Kendrapara canal by means of the Patamundai canal; (4). The Taladanda canal, with its branch, the Machgaon canal. The tract between the main stream of the Mahanadi and he Brahmani was irrigated by the Patamundai canal on the north and the Kendrapara canal on the south. The Gobri canal formed a connecting link between them to the east. Both these systems drew their supply of water from the south flank of the anicut across the Birupa, which also fed the High Level canal. The anicut across the main branch of the Mahanadi fed the Taldanda and Machgaon canals, which irrigated the northern and southern edges of the tract between the Mahanadi and Kathjuri
rivers. All these canals maintain a high level along the banks of the rivers, were always higher than the intermediate alluvial tracts.¹⁵⁸

**Economic Consequence of Canal Irrigation:**

By introducing the modern irrigation system in Orissa the colonial government expected a great increase in the total land revenue collections from the province. But the canal schemes failed miserably not only in its primary objects of providing communications, irrigating the province and controlling the floods, but also in its secondary object of increasing the land revenue.¹⁵⁹ The progress of irrigation network in Orissa was not rapid. For example out of the original estimate of 26 lakhs of acres, the canals could only irrigate 3 lakhs acres of land in the first fifty years. As regards the flood control measures, it was true that canals rendered some protection to the people living within the protective embankments, but at the same time these embankments turned the whole volume of water against the areas on the opposite sides. As a result, the flood water in the unprotected areas grew in volume and became violent every year. Every year the people within the protective embankments found themselves in deeper and deeper pits and thus was liable to greater and greater danger in case of accidental breaches in the


¹⁵⁹ As Elizabeth Whitcombe argues "contrary to expectations the canals did not pay ", See Elizabeth Whitcombe, 'Irrigation’, in Dharma Kumar (ed.) *The Cambridge Economic History of India*, vol. II, op.cit., p. 697, also see, pp. 702-703.
embankments. In 1920 when some of the protected area was inundated and formed deep lakes people had no other way but to live on the tops of trees and roofs of their tumbled down houses.\textsuperscript{160}

The capacity of the rivers to hold water was reduced every year because of the seven massive stone weirs constructed across them. The beds of these rivers above the weirs were mostly filled up with sand to the level of the crest of the weirs. The reduction in the capacity of the rivers led to the short supply of water to the canals and from there to the fields. Further to protect the canals and the people in the vicinity against floods, high embankments were constructed on the sides of the rivers and both the sides of the canals, which led to the closure of many smaller branches. The water that flew by these small branches in ordinary floods and the water that in times of high floods spread all over the side lands were forced to pass by the main channels of the rivers and deposited in the channels all the sands that were distributed on all sides and in the bed of the branches. This caused a rise in the level of riverbeds, which was responsible for the rise in the flood level. The Public Works Department raised the height of riverside embankments, but the levels of the lands inside the embankments remained the same as they were before.\textsuperscript{161}

\textsuperscript{160} Government of Bihar and Orissa, \textit{Legislative Council proceedings}, 7 March 1923, pp. 906-910.

\textsuperscript{161} Ibid.
As discussed earlier, the higher the flood level, the greater was the danger to the protected people and they suffered much when there was any breach in the embankments. Not all the lands within the protective embankments were irrigated. Nearly half of the protected areas remained without irrigation. Both the irrigated and unirrigated portions on the side of the embankments were deprived of the river silt (which earlier enriched the soil) and thus the fertility of the soil deteriorated. 162

Nevertheless, the canal water provided security to the cultivators of the irrigated area during the period of scanty or no rain. In Orissa the normal rainfall was ample, above 60 inches per annum. But when the rainfall was short or inadequate the demand for canal water went up which shows that the canal irrigation facilities were primarily used as a protection against draught. In fact in years of adequate and well distributed rainfall, there was no significant difference between yields in irrigated and unirrigated fields. Random crop-cutting experiments done in Cuttack sadar sub-division during 1928-1931 showed that when there was adequate rainfall and no major floods, the average yield was 23 mound and 16 seers of paddy per acre in the irrigated

162 Ibid.
area and 23 maunds and 3 seers of paddy per acre in the unirrigated area.\textsuperscript{163}

The canal irrigation, in addition to providing protection against insecurity of rainfall brought changes in the pattern of cultivation. For instance, owing to the availability of water, some highlands lying on both sides of the canal, hitherto uncultivated were brought under the plough. Lands, previously growing autumn rice and summer rice could grow winter rice and other varieties of good rice which required more water. It also encouraged the cultivation of crops like sugarcane and vegetables and double cropping. But such benefits were not very significant because the irrigated area was not extensive. As S.L. Maddox, the Settlement Officer reported, prior to 1897 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 additional rents. But when the rents were settled in the canal-irrigated area in 1897 a considerable increase in the sugarcane cultivation was found in the subsequent years.\textsuperscript{164}


**Canal Revenue:**

When the canal project in Orissa was first initiated the colonial governments expectations centered round the canal revenue. In 1867 the Directors of the East India Irrigation and Canal Company estimated that the scheme would give a net income equal of 21 percent of the outlay. Nevertheless, these hopes soon proved delusive. It was found that the receipts did not cover the working expenses.\textsuperscript{165}

Exhaustive enquiries on the rents in irrigated area were made in 1896 by the Settlement Officer and it was found that rents were not higher in irrigated than in unirrigated areas. There was no evidence, according to that enquiry, 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. In 1897 it was reported that the collections were better in irrigated villages because the crop was more secure and also that irrigation rendered possible the cultivation of special crops which paid a higher rent but it was observed that the raiyat did not reap a considerable profit after payment of the water rate, except in the case of a particular crops like sugarcane which was profitable. However, irrigation of rice lands was usually resorted to by

\textsuperscript{165} Report of the Indian Famine Commission, 1898, Simla, 1898, pp. 343-344. Also see discussion on water rates on the Orissa canals and replies received by E. L. Glass, Engineer, Irrigation, and Secretary to the Government of Bihar and Orissa, Irrigation Department, from the District Collectors of Cuttack, Balasore and Puri, between May and July 1931, in Government of Orissa, Revenue Department, Land Revenue Branch, December 1931, B Proceedings, No. 169-171.
the cultivators for the added security which it provided. Moreover, it was a method of insurance, which minimised the risk of loss of crops. However, the cost of maintaining the irrigation system was in excess of their real output, and therefore, the material improvement of modern canals as a well-devised irrigation system had but little scope under the colonial rule in Orissa.\textsuperscript{166}

The normal rainfall being ample in Orissa the value of canal irrigation was exceptionally dependent on the character of the season, and the raiyats did not consider canal irrigation so absolutely indispensable so as to make it worth their while to pay for the irrigation leases and to have all their land irrigated. The question of the rates to be charged for water does not appear to have been considered at the time when the Irrigation Company was formed. However, after the works were taken over by the Government in 1868 a scale of rates were notified which was beyond the capacity of the average raiyats to pay. For example, Rs.6.00 was charged per acre for sugarcane, Rs. 5 for certain other crops and Rs.3 for any single crop not remaining more than six months in the ground. The cultivators declined to pay such high rates and were afraid that irrigation may be

\textsuperscript{166} Ibid. In this connection Elizabeth Whitcombe points out "The continued failure of the works to pay was clearly to be explained by the absence on the part of the cultivators of any demand for the water; local tenurial conditions were reputed to place the Oriya peasant at the Zamindar’s mercy, depriving him of any incentive to increase his productivity by irrigation or any other means". See Elizabeth Whitecombe, "Irrigation", op.cit., p. 702.
made a ploy for enhancing the rents and revenue. To assure them against any increase in the rents and revenue, the Government issued a proclamation which declared the water-rates to be wholly distinct from land revenue, and promised that in the Provincial Settlement of 1897 no increased rate of assessment would be imposed on any land by reason only of their being irrigated. These promises, however failed to produce much effect, and much more effective inducement to take water was afforded by the gradual reduction of the rate to Rs.1-8-0 per acre. As a result of this measure, irrigation increased slowly, but on the whole steadily and by 1876-77 there were 30,000 acres, in 1889-90 it reached upto 186,627 acres. From 1912 the water rate charged for the kharif season was Rs.0-2-0 and in 1922 to Rs.3-8-0. For dhoya or water logged lands the rate were lower viz. Rs.0-12-0 in 1912, Rs.1-8-0 in 1920 and Rs.2 in 1922. These rates have been reduced in 1931, to Rs.3 and Rs.1-12-0 respectively for all canals except the High level canal, Range-III, where they were Rs.2-8-0 and Rs.1-8-0 respectively. The rate for season lease for the khariff season was reduced in 1931 from Rs.4-8-0 to Rs.4-4-0 (Rs. 4 in case of High Level Canal Range III). The same was also applicable for provisional leases.

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167 Utka Dipika, 24 February 1912.
The rate for *rabi* season leases was reduced from Rs.2-8-0 to Rs.2 for all canals. For sugarcane there were special rates viz. Rs.7-8-0 for the period of cultivation, Rs.5-8-0 for the period from 1 April to 16 June and Rs.1-5-0 for a single watering. The figures of irrigated areas mentioned above shows that the raising of the rates in 1922 caused a decrease in the demand for irrigation.\(^\text{169}\)

The *Kharif* irrigation that had gone down from about 70,000 acres in 1921-22, to about 37,000 acres in 1929-30 were not renewed after 31 March 1931. In 1931-32 the declining trend continued. The falling off was greatest in Range-III canal, where there was no renewal of leases since 1925. The reason explained for this deplorable condition of irrigation was as follows.\(^\text{170}\)

1. Increase of water rates in 1922 when the rate for *Kharif* long-term lease was raised from Rs. 8-0 to Rs.3-8-0 and for season leases from Rs.3-8-0 to 4-8-0.
2. Comparatively heavy soils under Range-III canal with not much need for irrigation except in years of abnormally short rainfall.
3. Falling off in crop out turn due to decreasing manurial value of silt from canal water.
4. The cultivator's fear of a recurrence of the severe damage to irrigation channel which was caused by exceptionally heavy flood of 1927.

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\(^\text{169}\) W.W. Dalziel, op.cit., p. 15.

The Government made special efforts through the Irrigation Officers to obtain new leases in liberal terms but could not achieve success. The demand for irrigation began to fall off and has steadily reduced since 1922 when the water rate was enhanced. The colonial administrators admitted that the higher water rate was uneconomic one for insurance of the rice crop in the coastal tract. If the monsoon rains failed the people offered to take irrigation facility for Rs.4-8-0 per acre for season leases and the ten-year leased area also increased.\textsuperscript{171}

Undoubtedly the irrigation system in Orissa was a valuable stand-by for occasional years of drought but it may be said that the continuous maintenance cost of the canal system was in excess of their real output. During the five-year period from 1925-26 to 1929-30 the average annual revenue receipt including tollage from the Jajpur and Range-III canal was Re.113, 000 where as the annual expenditure for maintenance and establishment went upto Re.1,224,000.\textsuperscript{172}

The question of reduction of water rates for the Orissa canals was thoroughly investigated. Prior to 1903 the water rates for long-term \textit{kharif} leases were Rs.1-8-0 and for \textit{Dhoea} lands Re 0-8-0. In 1922 it was Rs.3-8-0 and Rs.2 for long term \textit{khariff} leases and \textit{dhoea}

\textsuperscript{171} Ibid.
\textsuperscript{172} Ibid., Government of Bihar and Orissa, \textit{Revenue Department, Agriculture Branch, Proceedings} no. 12-16, February 1935.
lands respectively which was 133 percent rise in respect of the former and 300 percent rise in respect of the later within a period of about 20 years. The reason of this hike in water rates was related to the rise in the prices of agricultural crops. However during this period the rise in the land rent was not more than 12 percent. As a result of this enhancement in water rates, there was a gradual decrease in the irrigated area.\textsuperscript{173}

\textbf{Conclusion:}

To sum up, the population of Orissa had undergone many vicissitudes upto 1941, after which there was a rapid growth of population. In Orissa the factors that determined the growth of population were the condition of health and mortality rate, rainfall affecting the output of agriculture. During the period under study, there was a reduction in the population in 1911-1921 all over Orissa out of which the reduction of population in Puri District was prominent (See Figure 1.4). This loss of population was attributed to the series of natural calamities, crop failures and diseases. In 1931, the population in Orissa increased in all the districts. In 1941, also there was an overall increase of population. In Orissa, the ratio of female population was higher than the males. It further went up in all the districts during the decade from 1911 to 1921 and after that there was a continuous decline but their number remained above that of the

\textsuperscript{173} Ibid.
males during the period under study. The density of population in the coastal districts was comparatively higher than the Feudatory States because the alluvial coastal plains had more arable lands that were fertile and had the facility of canal irrigation.

Being mainly agricultural, about 96 per cent of the population of Orissa lived in rural areas and nearly four per cent of the population lived in the towns. Although there was slow increase in the urban population (see Figure 1.9), it remained very insignificant and there was no addition to the number of towns in the districts of Cuttack, Balasore and Puri during the period under study. The absence of large-scale industries led to the over-dependence of population on agriculture.

The proportion of males was always higher in the urban areas than in the rural areas whereas in the rural areas the number of females was more. This was mainly because of the fact that women had a limited role in the of urban occupations like trade, commerce and industry etc. It is the lure of a professional or business career that attracted male immigrants to the urban centers, who left their families at their rural native place.174

The literacy rate in Orissa was very poor during the period under study. Even in the 1941 Census, we find the average number of male literate in Orissa as 13.14 percent of the total male population and

female literate as less than one percent of the total female population. Though the number of females were more yet their literacy rate was very poor and much improvement was not noticed during the period of 20 years from 1911 to 1931 (see Figure 1.12).

In Orissa the percentage of people who earned their living by agriculture had an upward trend. On the other hand, the occupational activities like industry and commerce had a decreasing trend during the period of study. However, the indigenous industry e.g., spinning, weaving, bell metal industry, etc. revived at a low level of activity and output. This was evident when we compare the occupational distribution in Orissa in 1921 and 1931 (See Table 1.3 and Figure 1.11).

In our discussion on the colonial forest policy in Orissa we find two significant problems faced by the Oriya peasantry. First, it was the denial of access to the forests demarcated as Reserved and imposition of forest cess to use the protected forests. Secondly, restrictions on the right over trees in their own lands which were subject to the control, consent, and share of the zamindars. This gave birth to serious discontentment in the form of the peasant movement after the mid 1930's, discussed later in Chapter VI. There were series of peasant meetings under the Utkal Kisan Sangha, which besides other demands urged for tenants rights over trees and access to the forests.
Subsistence farming dominated agricultural production in Orissa. As rice was the principal crop, the prosperity of the agrarian population depended on the success of this crop. Chapter IV analyses the long-term trends in Orissan agriculture. The fertility of the soil was greatly affected by the floods because of the inundation of sand into the agricultural field. Heavy sand deposits sometimes led to the suspension of cultivation in those fields for many years. To clear the sands the government sanctioned agricultural loans and even free grants. But, this gesture of governmental help could not help to protect the peasantry from their distress.\textsuperscript{175} This was because the free grants were inadequate.\textsuperscript{176} Moreover, the poor Oriya cultivators were reluctant to incur further loans, as they were already highly indebted due to loss of crops.

The analysis of the modern irrigation system devised by the colonial government reveals that the canals scarcely benefited peasants because of the high irrigation charges and higher assessment of their land due to irrigation. Moreover, in Orissa, the rainfall being sufficient to raise the rice crop, the need for canal water was felt only when there was a shortage of rainfall. However, at such time the canals often failed to meet the heavy demand for water. Therefore,\textsuperscript{175} \textit{Utkal Dipika}, 25 November 1916.

\textsuperscript{176} See \textit{Krushaka Sankhali}, (Oriya Magazine) Vol. I, No. 10, October 1928. Moreover, as an Oriya periodical "Dagar" complained that many persons, who were unaffected, by flood managed to get the Tacavi loan through dishonest officers. See \textit{Dagar}, 1 October 1940.
cultivators remained dependent on the traditional irrigation system. Furthermore, the canals did not cover a significant portion of the entire cultivable land so that traditional irrigation system continued to remain important.