

Chapter 2

Physical Features and Biodiversity

The evolvement, evolution and sustenance of life on earth is the outcome of mutually self-replicated cause and effect of its physical and biological factors. The effects of a minutest activity of a lifeform upon the nature has been theorized by Edward Norton Lorenz (1917-2008),¹ a mathematician and meteorologist at the Massachusetts Institute of Technology (MIT) who pioneered the ‘Chaos Theory’ and build a mathematical model, aptly named as “The Butterfly Effect”, wherein he propounded that “a butterfly flapping its wings in South America can affect the weather in Central Park”. This theory otherwise speaks that every lifeform, rightly beginning with the microscopic ones has a phenomenally integrated impact on the environment of the earth.

The literal meaning of ‘Bio’ is life and ‘diversity’ means variations. So, in general terms, biodiversity means the whole array of variables among all forms of life; whether in plant or in animal species. The delicate admixture of both of it on the geographical fabric of the earth’s biosphere makes it the only known lively place on the entire cosmos. The complexities and the extent of the term ‘Biodiversity’ can be divided into two broader streams viz. the genetic diversity and the species diversity. The genetic diversity leads to the formation of new species in the process of natural selection through chromosomal mutation in the process of reproduction. The species diversity on the other hand may be within the species or in between the species.

Any biological system or ecosystem is dynamic in nature. Such changes in its process have never been static.² However, the geographical features and the locational position of a region on earth provide the very environment on which the biological fabric may naturally evolve and grow with all its complexities. The equatorial rainforests just within a few degrees on both sides of the earth’s geographical equator, however richest in biodiversity is not proved to be an ideal zone for human settlement. Extreme temperature and almost regular rainfall in the equatorial region create a humid climate and damp ground which no doubt is best for growth of plants and supports primitive life forms in abundance but not a place to support healthy living for human beings. The region that follows up to the tropic of cancer on northern hemisphere is otherwise named as the tropical region provides some balanced condition in favour of the humans to live with nature. The terrains of south Odisha region mostly situated on the Eastern *Ghāts* is such a

unique place within the tropical region that supports greater degree of biodiversity. A retrieval of every decade towards history shows a retardation in the rate of pollutants on environment as well as decline in the rate of deforestation inflicted by the human beings, as such the forest coverage in the past had undoubtedly been richer on an inverse timescale.

Before independence, while the British governed India, south Odisha was comprised with the territories of undivided Gañjām, Korāput and the Bālligudā and G. Udayagiri *Tāluk* of Phulbāni district, where the MFA 1882 was in force.³ So far as the biodiversity of the places was concerned, due to uniqueness in geographical, climatic and environmental features, its manifestation in the region was rather vivid in nature. When a comparison is made at district or regional level, it is revealed that every such patch of land, due to varied reasons, has some distinct biological features than the others.

From administrative viewpoints, during the colonial period mines and minerals were also falling within the ambit of the then forest laws. But the study over the mineral assets belonging to the area in historical perspectives has some liming factors since the value of the mineral assets on the crust of earth is representative to its rate of prospecting, mining and utilization through conversion into useful products. Merely the existence or non-existence of minerals and its extent of reserve beneath the earth's crust may be important from the geographical point of view but renders little value from historical perspectives. Hence, the history of minerals is the history of knowledge of the people about it and its actual utilization through industrial operation. The real industrialization is measured by how much of these basic metals are getting converted to technological products through various industries.⁴

The area is highly rich in mineral assets like bauxite, graphite, granite and limestone but during the colonial period neither the content was substantially mapped nor there were extensive steps from the part of the rulers to establish industries for conversion of the minerals into useful products.

2.1 Forests in South Odisha

The forests of south Odisha exhibit local level differences in quality, composition and density. The forests are of varying types greatly differing in nature, intermixed and interrupted by superior or inferior types which show much diversity in representation and combination of the main species.⁵ Based on Champion's classification, the forests were broadly classified into three categories viz. the deciduous forests, the tropical evergreen forests and the alpine shola forests.⁶ Although, those categories did not represent the exact

types as described by him. The forests of south India were thus divided into the following categories:

1. South Indian moist deciduous: -
 - (a) Mixed forests;
 - (b) *Sāl* forests; and
 - (c) Hilly Savanna.
2. South Indian dry deciduous: -
 - (a) Mixed forests; and
 - (b) Thorn forests.
3. South Indian dry evergreen miscellaneous forests.

2.1.1 South Indian Moist Deciduous Mixed Forests

These forests occur in the extreme north-west portion of Andhra laying to the left of Pārvatipuram and Rāyagaḍā and over a part of Pālakondā *Tāluk* at an altitude varying between 305 meters and 763 meters, with an annual rainfall of 1.01 to 1.52 meters, and on the deep soils of disintegrated gneissic rock. The average height of the matured dominant trees there were 12 to 18 meters and above. Grasses were frequently manifested in open areas but nowhere found in closed canopy. Ferns were common along the banks of the streams.⁷ The much-diversified types of flora found in the area was due to the favorable climatic conditions, but the growth was somehow stunted due to shallow soils and rocky terrain. The trees, therefore, remain less than 15.2 meters in height and the girth does not exceed 1.2 meters. There were no pure forests and the vegetation was of mixed varieties of trees. The concave declivities of high hill ranges and the lower elevations were the transitional lines where the moist types merge with the more equally extensive and preponderant forests of dry deciduous types. Teak was not commonly found in those areas.

2.1.2 South Indian Moist Deciduous Sāl Forests

The *Sāl* forests lie between and along the sides of the Nāgāvali and Vamśadhārā rivers.⁸ The altitude of the area varies from 15.4 to 457.2 meters. Most of the *Sāl* forests lie below 365.76 meters only. The average annual rainfall in the area was between 101.6 cm. to 127 cm. and the soils were of deep sandy loam with good subsoil drainage and boulder deposits over lined by deep fertile forest loam. Excess of clay leads to stunted growth of plants. On hard laterite soils, the growth was either stunted or absent. *Sāl* was found extensively in the forests of Korāput.

2.1.3 Moist Deciduous Hilly Savannah Forests

The hilltops bordering Odisha were normally grassy and bare, without any woody vegetation, while the slopes contain the Savannah forests besides the semi-evergreen and moist deciduous forests. These forests were mostly found in small patches on the hill tops of Eastern *Ghāts*.

2.1.4 South Indian Dry Deciduous Mixed Forests

These forests occur on exterior hills and valleys and in less moist areas and more exposed slopes at an altitude of 243.84 to 609.6 meters where rainfall was less than 101.6 cm. The forests were of lesser height and consists of coppice growth. The average girth of the trees varied from 76.2 to 101.6 cm. The trees were of more deciduous in nature and was always devoid of evergreen species in the top canopy.⁹ The forests were of lesser height and were open type forests. They contain fewer species than the moist deciduous forests. The fringes of these forests, close to villages, had constantly been subject to illicit felling and thus reduced to inferior coppice stock. As the forests were easily accessible, they were also subject to heavy grazing, burning and indiscriminate hacking. As a result of these adverse influences, these forests contain immature and young stocks.¹⁰

2.1.5 South Indian Dry Deciduous Thorn Forests

Those forests normally occur at an altitude below 243.84 meters with an annual rainfall of less than 101.6 cm. The forests were restricted to eroded slopes having boulders and gravelly surface with shallow or no soils which were absolutely devoid of organic matter. Those are characterized by marked preponderance of thorny species and reduced numbers of trees to shrubs. The forests were the result of biotic factors rather than the climatic and edaphic factors.

2.2 Physical Features and Topography of South Odisha

The area what is referred to as south Odisha under Madras Presidency was bounded by Bay of Beṅgal to its east to the hilly terrains of Bālligudā Subdivision of Boudh Khoṇḍhamāl district that was formed after independence of India to the west covering about 180 km length. Again, from the Chilikā lake to the north and narrowing down to the tip of the Korāput district ending at village namely Motu to the south covering roughly 430 km.

Within its geographical boundary, the area exhibits varied topographical features with significant contrast. Over 60 percent of the area is a hilly region covered with dense

forest of mixed nature and the rest is the coastal plain land with variation in elevation from sea level up to a staggering 1672 meters at Deomāli Hills of Korāput. On temperature scale, it is mild and less variant near the coastal region while some places in west and south achieve sub-zero degree Celsius in winter experiencing fall of frost. The entire area was somehow carved on the map as two districts namely Gañjām and Korāput under the Madras Presidency having distinct geographical and associated topographic features.

2.2.1 Gañjām District

Gañjām was the northernmost district of the Madras Presidency which formed a part of the Northern *Circārs*.¹¹ The district was named after Gañjām, the old port-township which was situated on the northern bank near the mouth of the Rushikulyā river. It was also the then headquarters of the district during early British administration up to 1815.¹² The district lies between 18° 12' 45" and 20° 25' 40" North latitude and East longitude 83° 33' 20" and 85° 15' 00" and bounded on north by Cuttack and Puri districts of the Bengal Presidency, on east by Bay of Bengal, on south and west by Vizagapatam district.¹³ The area was 8,313 square miles or thereabouts.¹⁴ The Eastern *Ghāts* running on the western side approach to within 15 miles of the sea at Baruvā, behind which rises one of the highest peaks of the district- Mahendragiri. The hills were for the most parts beautifully wooded and the interspace between them intermittently filled with rocky hills and fine topes.

Out of the total area of 8311 square miles of the district, 5205 square miles were hill tracts which were called as the Agency areas. With regards to size, Gañjām district ranks the sixth among the districts of the Madras Presidency. Geographically, the district divides itself into the *Maliāhs* or Hill tracts, and the plains; and contains 16 large and 35 minor *Zamindāries* or proprietary estates, besides three Government *Tāluks*. There were altogether 16 towns of which two are Municipalities and 6879 villages; of the latter, 2706 were in Agency tracts. Berhampur was the chief town of the district and was also a military cantonment.¹⁵ The French were the first Europeans to take possession of the district of Gañjām. They built their fort at Gañjām, a place five miles from Chhatrapur which was then the most important town of the district. The French got this district from Salabat Jung, the *Subedār* of Deccan, who assigned the Northern *Circārs* to the French out of gratitude for services rendered by the French to him. But the Chicācole *Circār*, which then included the Gañjām district, continued to be administered by a Muslim *Faujdar* subject to the authority of the French.¹⁶ About the year 1752, the struggle for supremacy between the French and the English was at its height. With the capture of Musalipatam, the French headquarters in those days, in January 1759 by Clive under Colonel Forde, the English

gained the supremacy in the Northern *Circārs*. Salabat Jung changed sides and made a treaty with Forde agreeing to cede to the English the Northern *Circārs* except Guntur. The treaty was also confirmed by his brother Nizām Ali who murdered and succeeded him and the same was consented by the Moghul Emperors with directions to ‘give the Northern *Circārs* as *inām* or free gift to the English from April 1762.’ But the English took the actual possession of the grant after the conclusion of another treaty signed on 12th November 1766. The *Subedār* of Deccan, Nizām Ali, through that treaty agreed ‘to write letters to all the *Zamīndārs* acquainting them that they were, to regard, in future, the English Company as their sovereign and to pay their rents and obedience to the same company or their deputies without raising any trouble or disturbance. It was thus the Northern *Circārs* including the Chicācole *Circār* of which the Gañjām district then formed a part, were finally secured to the English. They established their headquarters at Gañjām Fort, which was abandoned in 1855 owing to the outbreak of a very dreadful epidemic fever i.e. cholera which reduced the population of the town from 30,000 to less than 6,000 within a very short time. The treasury was first transferred to Mansurkotā i.e. Gopālpur, and then to Berhampur and ultimately to Chhatrapur.¹⁷

Mr. Cotsford was the first Englishman appointed as Resident to take the charge of Gañjām in the year 1767. He found that the *Zamīndārs* in Gañjām refused to submit to the authorities of the British and intercepting all communications between Beṅgal and Madras. So, fight often took place between the British and several *Rājās* of Ghumsar, Pāralākhemuṇḍī, Vijaynagar (Bada-khemuṇḍī), Pratāpgiri (Sano-khemuṇḍī) and Mohuri. With regard to the tributes paid by the *Zamīndārs* of the district, the Resident once remarked that, they were in most cases out of all proportion to the size of the estate, and the ability of the *Zamīndārs* to pay. He hoped that by gradually demolishing their forts and strongholds they might be reduced to a state of obedience that would give the Company an opportunity of apportioning their tributes in consonance to the size of their estates. Mr. Cotsford was of the opinion that the *Zamīndārs* must be reduced by arms. So, the Company’s troops were constantly employed either in demanding the tributes of the *Zamīndārs* who but rarely paid without either compulsion or threat or in quelling disturbances. In 1794 the office of the Resident was abolished and the office of the Collector which continues till today was established with the appointment of Mr. Walter Balfour as the Collector of Gañjām. In 1802 Chicācole division was incorporated with Gañjām and Mr. Cherry became the first Collector of the United Province. Gañjām district was then comprised of all the territories to the north of the Nagābali river near Chicācole

and extended from Mohfuz Bandar on the seacoast in the south to Prayāgi on the Chilikā Lake in the north. It included four district *Havēllis* and 21 *Zamīndāries* including Pāralākhemuṇḍi.¹⁸ In 1803 the boundary of the district of Gañjām was demarcated. The district was divided into three divisions namely, Ghumsar, Chicācole and Berhampur. Each of the divisions contained a Government *Tāluk*, besides a number of *Zamīndāri* estates. Subsequently, two more divisions, namely, Chhatrapur division consisting of portions of Berhampur and Ghumsar divisions, and Bālligudā division comprising the whole of Gañjām Agency except the Pāralākhemuṇḍi Agency were created.¹⁹

After the creation of the province of Orissa on 1st April 1936, Gañjām district was separated from Madras Presidency and merged with Odisha. The then Gañjām district comprised of the whole of Ghumsar, Chhatrapur, Bālligudā divisions, part of Berhampur *Tāluk* and Ichhāpur *Tāluk* in Berhampur division, part of Pāralākhemuṇḍi plains and the whole of Pāralākhemuṇḍi Agency in Chicācole division. The Pāralākhemuṇḍi *Tāluk* was included in the district of Korāput for seven months only and was then transferred to Gañjām.²⁰ The Agency areas were then administered under a set of special rules formed under the Gañjām and Vizagapatam Act 1839, through which the Collector of Gañjām was acting as the ‘Agent’ of the Governor to enforce the special rules. Therefrom evolved the phrase ‘Agency area’ in respect of the tribal belts of the districts. The Kandhamāl subdivision was formed into a separate district for the purpose of the Kandhamāl Laws Regulation, 1936 but was tagged in to Gañjām with the Collector of the district as its *ex-officio* Deputy Commissioner for administrative purposes. The Special Assistant Agent, Bālligudā, with his headquarters at Russellkoṇḍā was appointed as the *ex-officio* Sub-divisional Officer of the Kandhamāl subdivision of the Gañjām district with a second officer stationed at Phulbāni to assist him in discharging the routine duties. From 26th January 1941, the office of the Special Assistant Agent, Bālligudā, together with the headquarters were shifted to Phulbāni.²¹

2.2.2 Korāput District

The district of Korāput lies between 20° 3’ and 17° 50’ North latitude and between 81° 27’ and 84° 1’ East longitude.²² It was the largest district in the Province of Odisha under the Madras Presidency having 9,875 square miles of area.²³ It was bounded on the north by the Kalāhāndi State and the district of Raipur, on the west by the Bastar district, on the south by the districts of East Godāvāri and Vizagapatam and on the east by the districts of Srikakulam and Gañjām.²⁴ The district was irregular in shape roughly

resembling the letter 'y'. Its south-eastern boundary runs parallel to the line of the east-coast.

Korāput was first constituted as a district on the 1st April 1936, when the province of Odisha came into existence. Before that date, it had been a part of the Vizagapatam district in the Madras Presidency. It comprises of the greater part of the areas formerly known as the Agency tracts of Vizagapatam which had on account of the backwardness of the inhabitants been administered by the Collector with certain special powers in his capacity as Agent to the Governor, under the Gañjām and Vizagapatam Act of 1839.²⁵

The district Korāput, was not a compact geographical unit as it consisted of four widely dissimilar tracts, each of which was separated by considerable natural barriers from the other three. The first of the four natural geographical divisions comprise of the three *Tālaks* of Bissamkatak, Rāyagaḍā and Gunupur.²⁶ The area consists of the two broad, almost parallel valleys of the Vamśadhārā and the Nāgāvali rivers, with ranges of high and rugged hills that hedge them in. The valley of Vamśadhārā declines from a mean level of about 1200 feet in the north of the Bissamkatak *Tāluk* to about 300 feet at Gunupur while that of Nāgāvali falls from about 1000 feet at Kalyānasingpur to 500 feet in the south of the Rāyagaḍā *Tāluk*. In the north of Gunupur *Tāluk* and east of Bissamkatak there were large tracts of forest containing some of the most valuable timber in the district.²⁷ To the south-west of the Rāyagaḍā *Tāluk*, it was a wild country, a tangle of hills and valleys, called the Nārāyanapatanam Agency, which was drained by the river Jhañjavati and its tributaries.²⁸ The area was cut off by steep *Ghāts* and mountains from the rest of the district to which it was attached by a narrow neck of its south-western corner, but it had easy and natural lines of communication with the Vizagapatam district which lies to its south.

The second physical tract was the 3000 feet plateau which extended from the southernmost limits of the Kalāhāndi state to the East Godāvāri district in Madras and was 110 miles long with an average width of 40 miles.²⁹ The whole area of the plateau was previously included in four *Tālaks* of the Vizagapatam district, but with the formation of Odisha as a separate state, an area around 2000 square miles was included in the Korāput district. The plateau was slightly tilted to the west and its eastern edge was boldly marked by a line of hills, which were the highest in the district. The portion of the plateau included in the Korāput district consisted of an undulating tableland profusely scattered with hundreds of little hills of a remarkable similarity of appearance. Near Korāput, the hills were denuded of all their forest growth and were intermittently cultivated to their very

summits with dry crops. Still at places where the process of denudation had not advanced too far, the hills were covered with low shrubs, though disfigured by patches of shifting cultivation.³⁰ The hills on the boundaries contain thick and valuable forest growth.

The third natural division was the 2000 feet plateau which contained the two *Tālūks* of Jeypore and Nawarangpur. In the south it falls away by steep *Ghāts* into Mālkāngiri *Tehsil* and in the east, it slopes down to Kalāhāndi district. In the north-east there was a region known as Pānnābeda *Muttāh* laying some 500 feet below the level of the rest of the plateau and separated from it by *Ghāts* and thick forests. The greater part of the plateau drains westward through the Kolāb, Iṅdrāvati and other smaller rivers; but at the northern corner it drops down into the valley of the Tel, a tributary of the Mahānadi. The *Tālūks* of Jeypore and Nawarangpur form the principal granary of the district. The Jeypore *Tālūk* was more thickly populated than any other area in the district, and especially in the north in the basin of Iṅdrāvati, there were numerous villages with wide tracts of paddy cultivation. In the north of Nawarangpur *Tālūk*, the Umerkote area was equally rich, though sparsely populated, where cultivation had since greatly extended.³¹

The fourth natural division of the district was the Mālkāngiri *Tālūk*. The area was declining from an elevation of about 800 feet in the north at the foot of the *Ghāts*, leading up to 2000 feet plateau to under 400 feet in the extreme south.³² A strip along the eastern boundary takes the *Ghāts* which uphold the 3000-feet plateau and the valley of the Māchkuṅḍ, which flows through the midst of this wild country. Here, there are hundreds of square miles of forests, sparsely inhabited by rude tribes. Several rocky wooded hills, some of them running to a considerable height break the monotony of the plain. Almost the whole of the area was nothing but a vast jungle. There was little good timber in the forest lying on the lower levels, though bamboos had a good market at Rājahmundry paper mills and they were floated down through the rivers Sabari or the Godāvāri.³³ In the north, there were good *Sāl* forests interspersed by natural growth of teak of inferior quality. To the south, near Venkatapalem, many square miles of area were covered with coarse grass, ten feet high, among which were scattered saplings. The jungles were rich in game, the special feature being the herds of wild buffalo which haunt them.³⁴

2.2.3 Hill System of Gañjām District:

The district of Gañjām with bounties of nature, possesses rich cultural traditions and the summit of Mahendragiri is a mute witness to it. The Eastern *Ghāts* running on its western side approach to within 39 km. of the sea at Baruvā. Behind it rises one of the highest peaks in the district, the Mahendragiri.³⁵ Most part of the hills was beautifully

wooded and the land between them and the sea was undulating interspersed with rocky hills.

Physiographically the district was divisible into the eastern coastal plains and the western tablelands rising to heights above 1,400 m. The east and the north frontiers of the coastal plains were covered with thick forests and nearly half of its area was *Sāl* forests. Towards the center and south, there were hilly areas with fertile valleys running towards the sea. The south-eastern portion of which was covered with fertile lands and extensively contained multi-cropped areas. The extreme north east was occupied by a portion of the Chilikā lake. Its immediate vicinity to the south was good for fishery and salt manufacture.

The western table land was a continuation of the Eastern *Ghāts* and was chiefly formed by two plateaus. The northern plateau lies between Bālligudā in the north and R. Udayagiri in the south containing hills ranging from 609.8 meters to 1364.28 meters in height. The southern plateau lies between Ramgiri-Udayagiri and Pāralākhemuṇḍi plains was higher in elevation and contains some of the highest mountains stretching eastward from the boundary of Andhra Pradesh. Some of the highest hill ranges in the district were Singarāju *Parbat*, Mahendragiri, Devagiri, Chaṅdragiri, Tāngiri *Parbat*, Dandamera *Parbat*, Gindabadi, Khundabala and Rāigarha. The two plateaus were chiefly inhabited by many tribes, the *Khoṇds* predominating in the north and the *Śavaras* in the south.³⁶

The G. Udayagiri of Bālligudā Sub-division from the east raised almost abruptly to form the region. The high plateau lying within these ranges is broken-up by numerous smaller ranges, which form an endless series of valleys varying in size from 2 to 25 square kilometers and the area was covered with primeval forests. It is a belt of high land ranging between 600 to 1100 meters in elevation and the highest peak is having an elevation of over 1170 meters.³⁷

2.2.4 Hill System of Korāput District

The district lies on the section of the great lines of the Eastern *Ghāts* and consists of four natural divisions. Several mountain ranges and isolated hills rise out of those tablelands. The most conspicuous range in the Rāyagaḍā sub-division was the Niyamgiri, a rugged mass on the borders of the Rāyagaḍā and Bissamkatak *Tāluk* which rise steeply from 1000 feet to a number of peaks, of which the highest was 4,968 feet.³⁸

Apart from a number of isolated hills, there were three other mountainous regions in the sub-division. Towards the south-west of Rāyagaḍā were the hilly regions of Nārāyanpātanā Agency, which were continuous with the 3000-feet plateau. Outstanding among the peaks were the *Atmā Koṇḍā* (4,608 feet) which stands five miles south of

Nārāyanpātanā. About 15 miles north-east of the town was the Subamadi *Dongar*, a long ridge running north and south with its highest point 4,414 feet above sea level. Towards the east of Rāyagaḍā, between the valleys of Nāgāvali and Vamśadhārā were the Kailāskotā hills. In this area the principal peaks were the Mathi *Koṇḍā* (3,619 feet), the Bajar *Koṇḍā* (3,304 feet) and the Jora *Koṇḍā* (3,289 feet). On the left bank of Vamśadhārā, towards the east and north-east of Gunupur the Puttasinghi hills were situated, the highest point was the Thaladi *Dongar* (3,217 feet).³⁹

The main feature of the plateau was the line of high hills which boldly marks its eastern edge. Taking them in order from north to south the most notable heights were the Pañchabat *Māli* (4,385 feet), the Karnapadi *Dōngar* (4,879 feet), the Meyamali *Parbat* (4,921), the Turia *Dōngar* (5,244 feet), the Deomāli (5,486 feet), the Polamakani *Parbat* (5,201 feet) and the Sirimanda *Parbat* or Damuku (4,642 feet). The Deomāli, also known as the Dudhari, was the highest point in the district and also in the Province of Odisha.⁴⁰

Towards the north of river Kolāb there were countless hills. The most prominent hill was the Hāthimāli (4,563), situated 16 miles north-east of Korāput. Towards the east of Nandapur the principal peaks were the Deonāni *Parbat* (4,264 feet) and the Kondiāmāli *Parbat* (4,433 feet) some 10 miles east of Pādwā rises the mass of hills, in which the Kolāb took its source. The main hill among those was the Sinkaram *Gutta* (5,316 feet), stands just on the boundary between Odisha and Madras.⁴¹

The 2,000 feet plateau of the Jeypore and Nawarangpur *Tāluks*, there were low hills. The chief hills of the Mālkāngiri *Tāluk* were those that hedge in the valley of Māchkuṇḍ throughout its course. The highest point in the *Tāluk* was the Golikoṇḍā (3,615 feet) in the north-eastern corner, about 7 miles to the north of Dudumā falls.⁴²

2.3 River Systems of Gañjām District

Since the hills of the district were close to the sea, the rivers flowing from the hills were not very large in dimensions. The main rivers of the district were the Rushikulyā, Bahudā and the Vamśadhārā.

2.3.1 The Rushikulyā

The *Rushikulyā* which is about 100 miles long, is the chief river of the district.⁴³ It originates from the Rushimāl hills, from which it took its name, near Dāringbādi area in Bālligudā subdivision at an elevation of about 1000 meter at north latitude 19° 59' 00" and east longitude 84° 13' 00" and flows in a generally south-east direction to drain into the Bay of Beṅgal near Gañjām.⁴⁴ The river, which was aptly called as the lifeline of the

district, passes through narrow strips of cultivable lands and then emerges into the plains below the South-Eastern Railway line. The Dhanei, the Bāhudā, the Badanadi, in the left and the Jorou, the Ghodāhāda on the right were its major tributaries. The river was not navigable. However, before introduction of road transport, wooden rafts were being floated down the river during the monsoon.

2.3.2 The Bāhudā

The river Bāhudā rises near Rāmagiri village in the district of Gañjām at an elevation of 600 meters at north latitude $15^{\circ} 3' 00''$ and east longitude $84^{\circ} 20' 00''$ and runs first in north-easterly and then in a south-easterly direction for a total length of 73 km. to join the Bay of Beṅgal.

2.3.3 The Vamśadhārā

The river originates from Kalāhāndi district, crosses Korāput and before passing entirely to Andhra Pradesh, serves as boundary between Gañjām and Srikākulam districts for some distance.

2.3.4 The Mahendratanyā

The river has its origin from the Mahendragiri Hills and flows west towards Rāyagadā. The total length of the river is 90 kms. and merges with the Bay of Beṅgal at Baruvā.

2.3.5 Minor Rivers and Natural Springs

The Sālki river originates from Rāikiā Hills of G. Udayagiri and falls in Mahānadi. The Kodogo and the Roul with its tributary, the Burakusma *Nala* take their origin in Bālligudā pass through rocky surface and finally join in the Tel river in neighboring district. The Loharākhandi origins from Kalingā *Ghāt*. Besides those there are numerous riverine flowing perennially throughout the year but the waterflow in summer is considerably low. All of those are rainfed rivers and in rainy seasons they use to turn violent. The bed of the rivers being rocky in nature there were little scope for them to change their course and flooding of such rivers was not known. The rivers are not compatible for navigation. Being hilly tracks, natural springs are abundantly found in the area. They are generally used for bathing and constitute the chief source of drinking water for the villagers.⁴⁵

Besides the rivers in Bālligudā and G. Udayagiri, there were so many small streams which flow in the district of Gañjām. Many of those streams generally flow in the

south-eastern direction to join the Bay of Beṅgal.⁴⁶ The rivers in the district had no perennial flow and thus were not navigable. However, wooden rafts were being floated down in the rivers of Vamśadhārā and Rushikulyā. Traders of Gañjām with their heavy loads of bamboo and grains went to the neighboring district of Puri through the Chilikā lake.⁴⁷

2.4 River System of Korāput District

Besides a number of perennial streams, the district can boast of five large and important rivers which form the greatest natural wealth of the district. The rivers and their tributaries group themselves into two sets, viz. those which flow eastwards through the coastal plains into the Bay of Beṅgal and those flow inland westward and the southward into the valley of Godāvāri.⁴⁸

2.4.1 The Vamśadhārā

The Vamśadhārā rises in the extreme north of Bissamkatak *Tāluk* and passes southwards through the center of Gunupur. It forms the boundary between the Gañjām and the Srikākulam districts and eventually passed into the Province of Madras, where its waters were extremely used for irrigation. The river is 173 miles long out of which a course of 88 miles runs through Korāput district. Rising from the extreme north of the *Tehsil* of Bissamcuttack the river flows through both the *Tehsils* of Gunupur and Bissamcuttack.⁴⁹

2.4.2 The Nāgāvali

The Lāngulya, otherwise called as the Nāgāvali in the upper part of its course, is a perennial stream which has its source among the steep hills of the Rāyagaḍā *Tāluk* and the Kalāhāndi state.⁵⁰ It flows nearly due south, past Rāyagaḍā, within six miles east of Parvatipur; and then turns slightly eastwards and enters the Bay at Mahfuz Bandar, near Chicācole i.e modern Srikakulam town.⁵¹ For the last twenty miles of its course it forms the boundary between Gañjām and Vizagapatam. At Rāyagaḍā it rushes through a narrow passage close under the lee of a wooded hill, and over a most picturesque double fall of 20 and 30-feet height. River gravel occurring at a height of 200 feet above the riverbed indicates a deep cutting river through soft soil as well as rising land. Below the falls the river was joined by an important tributary, the Kumbhikota *Gedda*, flowing from the east in a deep and narrow gorge. It is joined by another tributary the Jhañjavati, which drains the tangle of little valleys round Nārāyanapātnā area. Further south, the river plays an

important role in the irrigation of the Srikākulam district. Before it reaches the sea at Srikākulam, it undergoes change in its name and called as the Lāngulya.

2.4.3 The *Īndrāvati*

The next river to the south, the *Īndrāvati*, rises in the jungles of Kalāhāndi, winds in a very zig-zag course from east to west across the Nawarangpur *Tāluk* and enters into the Bastar state. The *Bhāskel* joins it just before it leaves the Korāput district. It forms the beautiful *Chitrakotā* falls about 25 miles west of Jagadapur in Bastar district. The total length of the river is 329 miles of which 77 miles run through Korāput district along its boundary.⁵² The riverbed is full of rocks and a succession of rapids, so navigation and timber floating were almost impossible.⁵³

2.4.4 The *Kolāb* and the *Sabari*

The *Kolāb* rises near Sinkaram hill on the 3,000 feet plateau, flows north-west in a winding bed and then drops rapidly down to the 2,000 feet plateau, not far south of Jeypore. At Bagara, to which a branch road leads from the top of the Jeypore *Ghāts*, there were three small falls whose potentialities as sources of hydro-electric power were investigated in the 1930s. It flows right across Jeypore in a north-westerly direction for twenty to thirty miles and then suddenly doubles back and runs nearly south, forming the boundary between Korāput and Bastar. Then it runs south into Korāput through a gorge in the wild hills west of Rāmagiri which were called the *Tulsi Dōngar* range. Turning west again and passing *Salimi*, the *Kolāb* flows into Bastar and forms the boundary between *Mālkāngiri* and Bastar. Towards the last part of its course, it was called the *Sabari* or *Sāberi* and joined by the *Poteru* which drains the center of the *Mālkāngiri Tāluk*. At *Motu*, in the extreme south-western corner of *Mālkāngiri* it meets the *Sileru* and the two passes out of *Vizagapatam* and fall into the *Godāvāri* river 25 miles further down. The total length of the *Kolāb* and the *Sabari* is 280 miles. The river was navigable only during monsoons. Even timber could only be floated down during the monsoon with great difficulty. From *Sunkam* to *Salimi* the stream was quieter, and timber could come down through it.⁵⁴

2.4.5 The *Māchkuṇḍ*

The *Macheru* or *Māchkuṇḍ* rises in the *Madgole* hills on the 3,000 feet plateau at first runs nearly towards north along a very meandering course, passing close under the *Yendrika* hill and through the wide *Padwa* valley. About 35 miles from Jeypore it winds westwards along the edge of the plateau and suddenly turns at a sharp angle to the south-

west down a steep descent of about 540 feet, otherwise known as the Dudumā falls. Below the Dudumā falls, the river flows south-westwards in a deep gloomy gorge hemmed in on both sides by rocky walls 700 or 800 feet high which continues for three or four miles until it reaches the Koṇḍākamberu. The valley of Māchkuṇḍ was the most inaccessible and the least populated region in the whole of the district. At Koṇḍākamberu, the river is joined by a large tributary namely Gurupriyā and flows entirely through forests down a steep and rocky course. The combined river is known as the Sileru. The river was not navigable and also destructive of all timber-floating operations.⁵⁵

2.4.6 The Tel

The Tel rises in the north of Nawarangpur *Tāluk*, forms some distance the northern boundary of the district, and then flows into the Kalāhāndi State. Later in its course it receives the drainage of the northern extremity of the Bissamkatak *Tāluk*. Then it eventually unites with the Mahānadi near the town of Sonepur. The river dries up completely in the hot weather.

2.5 Features of Forests of Gañjām District

The forests of Gañjām district can be classified into tropical semi-evergreen forest, tropical moist deciduous forest, tropical dry deciduous forest, mixed and dry mixed deciduous forests. Tropical semi evergreen forests were found in the moist valleys of Bālligudā and Mahendragiri hill ranges. The important plant species found in such forests were *mangifera indica* (mango) (Fig.1), *Diospyros embryopteris* (*Keṇḍu*) (Fig.2), *Dillenia pentagyna* (*Rai*) (Fig.3), *Michelia champaca* (*Champā*) (Fig.4), *Macaranga peltate* (*manda*), (Fig.5), *Mesua ferrea* (*Nageswar*) (Fig.6), and *Saraca indica* (*Asoka*) (Fig.7), *calamus* (*Canes*) (Fig.8) were found growing in shady moist places.⁵⁶

Mangifera indica (Mango)



Fig. 1

Diospyros embryopteris (Kendu)



Fig. 2

Dillenia pentagyna (Rai)



Fig. 3

Michelia champaca (Champa)



Fig. 4

Macaranga peltate (Manda)



Fig. 5

Mesua ferrea (Nageswar)



Fig. 6

Saraca indica (Asoka)

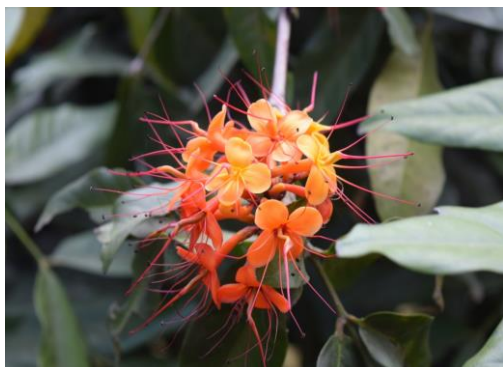


Fig. 7

Calamus (Canes)



Fig. 8

Bälligudā Forest Division which was created in 1938 includes G. Udayagiri Forest Range consisting of about 3,500 square kms. of mixed variety forest spread over the highland and its valleys. Geographical features like natural barrier to clouds causing a watershed on the opposite side of the range provides heavy downpouring in the ranges that supported the growth of dense forest.

The tropical moist deciduous forests occur along with semi-evergreen type. *Shorea robusta* (*Sāl*) (Fig.9), forests of high level were the main feature of these forests. The tropical moist deciduous forests had three distinct layers. The top layer of which consists of tree species of vigorous growth while the second layer consists of evergreen species. The plants of the top layer were predominantly deciduous shedding their leaves

annually for a short period.⁵⁷ The important species were *Shorea robusta* (*Sāl*), *Terminalia tomentosa* (*Asan*) (Fig.10), *Petrocarpus marsupium* (*Bija, Piasal*) (Fig.11), *Haldina cordifolia* (*Halanda*) (Fig.12), *Terminalia arjuna* (*Arjuna*) (Fig.13), *Anogeissus latifolia* (*Dhau*) (Fig.14), *Dalbergia latifolia* (*Sisso*) (Fig.15), and *Gmelina arborea* (*Gambhāri*) (Fig.16).⁵⁸ These forests were economically most valuable and were found in the areas of Korcholi, Panchagadatola, Jagannath Prasad, Kukkuluba and Gālleri *Muttahs*. *Dendrocalamus strictus* (*Salia Bāunsa*) (Fig.17) of poor quality occurs sporadically. *Sāl* wood of these forests were usually very superior, measuring 40 to 60 feet in length, from 6 to 8 feet in girth and it was stated that there were trees of 12 feet in circumference. Its use was formerly confined to the district alone but as the utility was known, there was a great demand of it for sleepers.⁵⁹ Amongst other economic plants in the district were *Terminalia chebula* (myrobolan) (Fig.18), *Diaspyros melanoxylon* (*Keñdu leaf*) (Fig.19), Broom grass (Fig.20), *Rauwolfia serpentine* (*Sarpagandhā*) (Fig.21), *Tamarindus indica* (Tamarind) (Fig.22) were largely found.⁶⁰

Shorea robusta (*Sal*)



Fig. 9

Terminalia tomentosa (*Asan*)

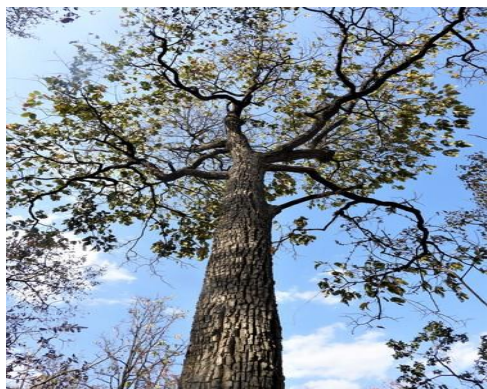


Fig. 10

Petrocarpus marsupium (Bija, Piasal)



Fig. 11

Haldina cordifolia (Halanda)



Fig. 12

Terminalia arjuna (Arjuna)



Fig. 13

Anogeissus latifolia (Dhau)



Fig. 14

Dalbergia latifolia (Sissoo)



Fig. 15

Gmelina arborea (Gambhari)



Fig. 16

Dendrocalamus strictus
(*Salia Baunsa*)



Fig. 17

Termenalia chebula (*Harida*)



Fig. 18

Diaspyros melanoxylon (*kendu leaf*)



Fig. 19

Broom grass



Fig. 20

Rauwolfia serpentine (Sarpagandha)



Fig. 21

Tamarindus indica (Tamarind)



Fig. 22

In the tropical dry deciduous forests, due to shallow soil, hot and dry climate, the quality of *Sāl* was very poor. The common trees like *Asana*, *Bija*, *Mahula* (Fig.23), *Bāhādā* (Fig.24), *Keñdu*, *Amlā* (Fig.25), and bamboo of poor quality were found in the forests.⁶¹ The dry mixed deciduous type of forests occur on the dry hill slopes where the soil was dry and shallow. The ecological condition was not favourable for the growth of *Sāl*. Poor growth in height and malformed trees along with broken top canopy have been the characteristic feature of these forests. The important species found in the forests were *Asana*, *Terminalia tomentosa* (Fig.26), *Keñdu*, *Bija*, *Bāhādā*, *Haridā*, *Pānasa* (Fig.27) and *Dhau*. *Butea monosperma* (*Palās*) (Fig.28) was very common in these forests.⁶² *Tectona grandis* (Teak) (Fig.29) occur in small patches along the Tel River near Baud-Kandhamāl.

Mahua longifolia (Mahula)



Fig. 23

Terminalia bellerica (Bahada)



Fig. 24

Emblica officinalis (Amla)



Fig. 25

Terminalia tomentosa (Asana)



Fig. 26

Artocarpus integrifolia
(Panasa)



Fig. 27

Butea monosperma
(Palasa)



Fig. 28.

Mixed forests occur extensively throughout the Baud Sub-division. They were classified into two distinct categories, viz. valuable mixed forests with *Petrocarpus marsupium* (Piāsāl), *Bridelia retusa* (Kāsi) (Fig.30), *Anogeisus latifolia* (Dhau), *Terminalia tomentosa* (Asana) and poor mixed forests with *Woodier ougeinia* (Māhi) (Fig.31), *diospyros melanoxylon* (Keñdu), *Bombax malaricum* (Simili) (Fig.32), etc.⁶³

Tectona grandis (Teak)



Fig. 29

Bridelia retusa (Kasi)



Fig. 30

Woodier Ougeinia (Mahi)

Fig. 31

Bombax malaricum (Simili)

Fig. 32

The *Maliāhs* or high lands were the irregular chain of the Eastern *Ghāts* which lie to the north and west of Gañjām. There were three plateaus, one from Baud frontier from Udayagiri in the Ghumsar *Maliāhs* and Sarangada of Chinna-khemundi (Sānakhemuṇḍi). The second one was considerably higher with fine hills and valleys intersecting in every direction and extends from Nuāgada in the Pāralākhemuṇḍi *Maliāhs* to Mahendragiri. The third one, from Mahendragiri to the Vizagapatam frontier was lower than the central plateau.⁶⁴ The forests of the *Maliāhs* were destroyed by continual clearing of the hill sides for the purpose of cultivation which prevents the trees of any size except in places where cultivation was not possible. The forest was chiefly *Sāl*, which was a very useful timber for building if well-seasoned, but the only trees the hill people could spare were the fruit trees from which they procured liquor.⁶⁵ The best forests were found on the slopes leading up into the hill country.

The valuable forest tracts in the Ghumsar had been roughly estimated at 400 square miles which was comprised of:

| | |
|-------------------------------|------------------|
| Really good <i>Sāl</i> tracts | 200 square miles |
| Indifferent <i>Sāl</i> tracts | 100 square miles |
| Mixed forest | 100 square miles |

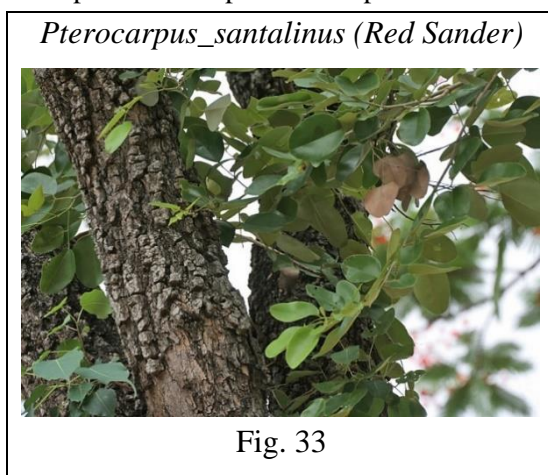
The *Sāl* in the other *Muttāhs* was not of good quality, but there was abundance of other trees which were less valuable. Burning of jungles to clear the land both for cultivation and for grazing purposes was a great hindrance to the growth of saplings.⁶⁶ The forest in the area were not reserved, hence there was a threat of reckless cutting of forests which would lead to denudation of the forests including all the valuable trees

within a short span of time if measures were not taken in that direction. More than of 10,000 tons of fuel were annually required for the Askā factory and were chiefly obtained from the hills and jungles around Soradā that was adjacent to the banks of the Rushikulyā, which runs close-by, affording facilities for floating the wood down to Askā at lesser cost.

The extent of the Soradā forests was roughly estimated at 132 square miles which was comprising of:

| | |
|---------------------------------------|--------------|
| Good <i>Sāl</i> tracts | 40 sq. miles |
| Indifferent <i>Sāl</i> tracts | 20 sq. miles |
| Unreserved sorts of timber & firewood | 72 sq. miles |

The Rogodā, Peruju, Salinga and Pochāngi *Muttāhs* contained superior *Sāl* wood and the good timbers which were found to the west of Soradā and Salinga *Muttāh* where licensed fellers were being chiefly resorted. Within that area there were plenty of young *Sāl* found which were of 20 to 30 year's growth.⁶⁷ The Red Sander (Fig.33), had been successfully planted at Lābanyagada of Mahendra Range over an area of 31 acres in 1920 and it was maintained as a preservation plot of the species which was special in Odisha.⁶⁸

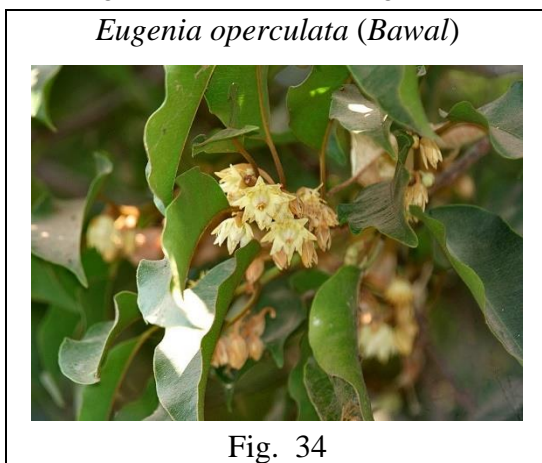


2.6 Features of Forests of Korāput District

Prior to the vesting of estates in Korāput district in the State Government in 1952, the forests of Korāput were all owned by the *Mahārājā* of Jeypore with the exception of some comparatively insignificant areas belonging to *Mokhasādārs* and *Ināmdars* who were tenure holders under the *Mahārājā*. In some cases, as in Ambadalā *Mokhasā* in Bissamkatak *Tehsil* the proprietors had surrendered the control over the forests in their estates to the *Mahārājā* through an agreement. In spite of the recommendations of the

Partially Excluded Areas Enquiry Committee in 1940 to introduce the Indian Forest Act (Act xvi of 1927) in the district of Korāput, the Madras Forest Act, 1882 was still in force. The MFA 1882 was extended to Jeypore estate in 1891. The forests were administered under the Jeypore Forest Rules framed under Section 26 of the MFA in 1882 till 30th August 1956 when they were replaced in 1956 by a new set of rules called the “Korāput District Forest and Waste Lands Rules, 1956”; published in notification No. 6108-ix-114/55-EA, dated the 30th August 1956 of the Revenue Department.⁶⁹

Under the earlier rules, the *Mahārājā*'s agents were empowered to prosecute persons committing offence under the rules. The Chief Forest Officer of Jeypore was then empowered to compound offences with the permission of the *Tāluk* Magistrate. The whole administration was under the general control of the Agent to the Governor.



The flora of Korāput had never been investigated. Though typically having some northern Indian characteristics, it had also its affinities with the flora of southern India. The flora was divided into four natural divisions. The vegetation of the Central plateau was of a degraded type. Originally it had a sub-tropical wet hill type with evergreen species. But fires and shifting cultivation had caused great changes in its distribution.⁷⁰ Above 4,000 feet, grassland was usually found, tree-growth being limited to scattered stunted specimens of *Terminalia chebula*, *Eugenia operculata* (Bawal) (Fig.34) was also found. In the vicinity of Korāput *poḍu* cultivation had caused complete disappearance of the original forest and practically no tree growth exists there saving fruit trees such as *Mangifera indica*, *tamarindus indica*, *Madhuca latifolia*, etc. Over the rest of the central plateau the evergreen type had been partly replaced by deciduous species such as *Petrocarpus marsupium*, *Bursera serrata* (*Garuda nimburu*) (Fig.35), *Garuga pinnata*

(*Kasaramba*) (Fig.36), *Terminalia belerica*, *Dalbergia lanceolaria* (*Chhota Sisoo*) (Fig.37), *Eugenia jambolana* (*Jāmu*) (Fig.38), *Ahogeissus latifolia*, *Bombax malabaricum* and *Terminalia tomentosa*. Evergreen species, most of which had not been identified, include *Michelia champaca* and *Pongamia glabra* (*Karañja*) (Fig.39). *Dendrocalamus strictus* was common in the locality. *Sāl* was scarcely ever found above 2,500 feet.⁷¹

Bursera serrata (*Garuda nimburu*)



Fig. 35

Garuga pinnata (*Kasaramba*)



Fig. 36

Dalbergia lanceolaria (*Chhota sisoo*)



Fig. 37

Eugenia jambolana (*Jamu*)



Fig. 38

Pongamia glabra (Karanja)



Fig. 39

Dillenia indica (Waou)



Fig. 40

Cleistanthus collinus (Karada)

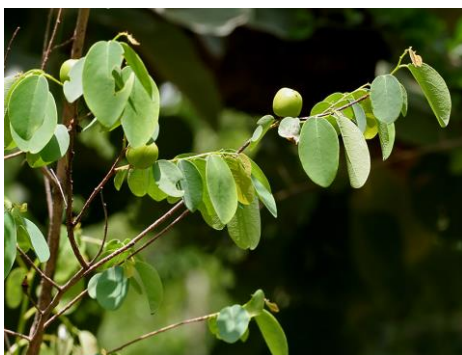


Fig. 41

Adina cardifolia (Bandhana)



Fig. 42

The greater part of the Jeypore plateau was covered with *Sāl* forest of a moist peninsular type. The commonest trees were the *Shorea robusta*, *Terminalia tomentosa*, *Anogeissus latifolia*, *Pterocarpus marsupium*, *Madhuca latifolia*, *Dillenia indica* (Waou) (Fig.40), *Bombax malabaricum*, *Gmelina arborea*, *Cleistanthus collinus* (Karada) (Fig.41), *Adina cardifolia* (Bandhana) (Fig.42), etc.

The underwood comprises species such as *Indigofera pulchella* (Nila) (Fig.43), *Phoenix acaulis* (Bhuin khajuri) (Fig.44), *Grewia* (Dhamana) (Fig.45) species, *Flemingia* (Ranidantakathi) (Fig.46) species, *Woodfordia fruticosa* (Dahifula) (Fig.47), *Embelia robusta* (Nunnunia) (Fig.48), *Cipadessa fruticosa* (Nalabali) (Fig.49) and *Ixora parviflora*

(*Kathārangani*) (Fig.50). Creepers include *Bauhinia vahlli* (*Sialilatā*) (Fig.51), *Butea superba* (*Naipalāsa*) (Fig.52), *Combretum decandrum* (*Atunda*) (Fig.53) and *Smilax marcophylla* (*Kumbhātuā*) (Fig.54). Grasses include *Imperrata arundinacea* (*Sabāi*) (Fig.55) and *Polinidium angustifoium* (*Bagali*) (Fig.56). Bamboos were very rare. Scattered patches of teak occur as far west as 82° 36' longitude. *Schleichera oleosa* (*Kusum*) (Fig.57) was very common in open cultivated tracts.⁷²

Indigofera pulchella (*Nila*)



Fig. 43

Phonix acaulis (*Bhuin khajuri*)



Fig. 44

Grewia tiliiforia (*Dhamana*)



Fig. 45

Flemingia (*Ranidantakathi*)



Fig. 46

Woodfordia fruticosa (Dahifula)



Fig. 47

Embelia robusta (Nunnunia)



Fig. 48

Cipadessa fruticosa (Nalabali)



Fig. 49

Ixora parviflora (Katharangani)



Fig. 50

Bauhinia vahlli (Sialilata)



Fig. 51

Butea superba (Naipalasa)



Fig. 52

Combretum decandrum (Atunda)



Fig. 53

Smilax marcophylla (Kumbhatua)



Fig.54

Imperrataarundinacea (Sabai)



Fig.55

Angustifolium (Bagali)



Fig. 56

Schleichera oleosa (Kusum)

Fig. 57

Xylia xylocarpa (Keli Kadam)

Fig. 58

The Mālkāngirī plateau was hotter and moist. Most of the peninsular *Sāl* forests were found on the *Ghāts* above the plateau and in the northern parts. It abruptly disappears at about 18° 30' latitude. Teak (*Sāguān*) was very common towards north. The best places for Teak were some small tracts round Sikkapalli and Akkuru and the banks of Sabari, Poteru and Sileru rivers. As a whole the Mālkāngirī forests contains little but sapling growth interspersed with wide swamps covered with high and almost impassable grass. Many of the deciduous species occur on the lower plateau. *Dalbergia latifolia*, *Xylia xylocarpa* (*Kangada*) (Fig.58), *Garuga pinnata* (*Kasaramba*), *Stereospermum suaveolens* (*Badapatuli*) (Fig.59) and *Terminalia belerica* were commonly found among other tree species. Creepers include *Spatholobus roxburghii* and *Milletia auriculata* (Fig.60). In addition to *Dendrocalomus strictus*, *Bambusa arundinacea* (*Kaṅtā Bāunsa*) (Fig.61), *Oxytenanthera nigrociliata* (*Bolonji*) (Fig.62) and an unidentified bamboo species occurred. Unidentified grasses which produce good fodder were very common and the plateau was well known for its cattle.⁷³

Stereospermum suaveolens
(*Badaptuli*)



Fig. 59

Milletia auriculata



Fig. 60

Bambusa arundinacea
(*Kanta baunsa*)



Fig. 61

Oxytenanthera nigrociliata (*Bolonji*)



Fig. 62

In the north-east and towards the common boundary with the Gañjām Agency tracts, moist peninsular *Sāl* forests were dominating. *Sāl* ascends to the summit of some of the highest hills which were over 4,000 feet in height. All the species which occurred in the Jeypore plateau were also found in this plateau. Additional tree species include *Albizzia procera* (*Dhalā sirisa*) (Fig.63), *Dalbergia lanceolaria* (*Chākundā*) (Fig.64), *Callicarpa indica* (*Boda*) (Fig.65), *Accasia lenticularia* (*Kaṅtā sirisa*) (Fig.66), *Artocarpus lakoocha* (*Jeuta*) (Fig.67), *Cidrela toona* (*Tun*) (Fig.68), *Trema orientalis* (*Kharkas*) (Fig.69), *Bursera serrata* (*Nimbura*), *Promna* species (*Gandhana*) (Fig.70). Amongst the shrubs *Scutia indica* (Cat thorn) (Fig.71), *Ardisia* species (Coral berry)

(Fig.72), wild banana (Fig.73), *Cycas circinalis* (*Odasamāri*) (Fig.74), *Clerodendron infortunatum* (*Genguti*) (Fig.75), *Mallotus philippinensis* (*Kamalāgundi*) (Fig.76), *Calusena pentaphylla* (*Bana limbu*) (Fig.77), *Coffea bengālensia* (*Banamalli*) (Fig.78), *Wrightia tomentosa* (*Khirua*) (Fig.79), *Wondlandia tinctoria* (*Tilai*) (Fig.80), etc. occur. *Dendrocalamus strictus* on basic rocks and *Oxytenanthera negrocilita* were also found. Amongst the creepers, *Ubaria hamiltoni* (*Sinduriā*) (Fig.81) were found in a large scale. Grasses such as the broom grass were found. In the lower stretches of the Nāgāvali and the Vamśadhārā valleys and on the hills bordering them the flora changes to a more coastal type. *Sāl* generally disappears in these places. New species of economic importance which were found includes *Strychnos Nux-Vomica* (*Kochilā*) (Fig.82), *Sapindus emarginatus* (*Rithā*) (Fig.83) and *Bombusa arundinacea* (*Kaṅtā Bāunsa*) were very common in those valleys.⁷⁴ Besides the above plants there were a number of trees and shrubs found in the forests. Those were *Morinda tinctoria* (*Achu*) (Fig.84), *Alangium lemorahii* (*Ankula*) (Fig.85), *Aegle marmalos* (*Bela*) (Fig.86), *Jasminum arborescens* (*Banamali*) (Fig.87), *Ficus bengālensia* (*Bora*) (Fig.88), *Zizyphus jujuba* (*Barakoli*) (Fig.89), *Erythrina suberosa* (*Pāldhuā*) (Fig.90), *Zizyphus oenoplia* (*Kanteikoli*) (Fig.91), *Citrus acerantium* (*Nārangi*) (Fig.92), *Strablus asper* (*Sāhāda*) (Fig.93), *Annona squamosa* (*Sitāphala*) (Fig.94), *Cassia fistula* (*Sunāri*) (Fig.95), *Ficus religiosa* (*Ustho*) (Fig.96) and *Artocarpus integrifolia* (*Panasa*) found in large numbers in the forests.

Albizzia procera (*Dhala sirisa*)



Fig. 63

Dalbergia lanceolaria (*Chakunda*)



Fig. 64

Callicarpa indica (Boda)



Fig. 65

Accasia lenticularia (Kanta sirisa)



Fig. 66

Artocarpus lakoocha (Jeuta)



Fig. 67

Cidrela toona (Tun)



Fig. 68

Trema orientalis (Kharkas)



Fig. 69

Premna latifolia (Gandhana)



Fig. 70

Scutia indica or *Scutia myrtina*
(Cat thorn)



Fig. 71

Ardisia species
(Coral berry)



Fig. 72

Wild banana



Fig. 73

Cycas circinalis (Odasamari)



Fig. 74

Clerodendron infortunatum
(Genguti)



Fig. 75

Mallotus philippinensis
(Kamalagundi)



Fig. 76

Calusena pentaphylla (Bana Limbu)



Fig. 77

Coffea bengalensis (Banamalli)



Fig. 78

Wrightia tomentosa (Khirua)



Fig. 79

Wendlandia tinctoria (Tilai)



Fig. 80

Ubaria hamiltoni (Sinduria)



Fig. 81

Nux-Vomica (Kochila)



Fig. 82

Sapindus emarginatus (Ritha)



Fig. 83

Morinda tinctoria (Achu)



Fig. 84

Alangium lemorahii (Ankula)



Fig. 85

Aegle marmalos (Bela)



Fig. 86

Jasminum arborescens (Banamali)



Fig. 87

Ficus bengalensis (Bora)



Fig. 88

Zizyphus jujuba (Barakoli)



Fig. 89

Erythrina suberosa (Padhua)



Fig. 90

Zizyphus oenoplia (Kanteikoli)



Fig. 91

Citrus acerantium (Narangi)



Fig. 92

Strabulus asper (Sahada)



Fig. 93

Annona squamosa (Sitaphala)



Fig. 94

Cassia fistula (Sunari)

Fig. 95

Ficus religiosa (Ustho)

Fig. 96

There were some interesting features of the Korāput flora. The distribution of teak was in scattered patches suggests that the species was once found over a greater tract. In the Mālkāngirī plateau and the adjoining forests of the Bastar State, *Sāl* reaches its southernmost limit in India then abruptly disappears. The non-existence of *Sāl* on the central Korāput plateau was probably due to the fact that the original dense evergreen presented an effective barrier against the growth of *Sāl*. In the Vamśadhārā and the Nāgāvalī valleys *Sāl* had not advanced nearly as far southwards as in the center and west of the region. Its distribution could not be explained on climatic or edaphic grounds. As the main valleys were under permanent cultivation, there was little prospect for further spread of the *Sāl* trees. In the central highlands, species like *Petrocarpus marsupium* and *Anogeissus latifolia* were very nearly evergreen in habit, which indicates that the climate was moister than that in which those species were found.

As no detailed description of the Korāput forests had ever been published, the facts about the forests of Korāput were mainly based upon the Reports of J. W. Nicholson, I.F.S, Conservator of Forests, Odisha, who visited the district in May 1937.⁷⁵

Umarmot, Nawarangpur, Jeypore, Kotpāḍ and a part of Rāmagirī range were situated on the plateau in which *Sāl* of a moist peninsular type occurred. A few patches of teak also locally found. The whole crop at one time was under shifting cultivation and the forests afterwards comprises pole crops in various stages of growth. Large trees were scarcely found. The forests were of great economic importance.

The Mālkāngirī, Motu and part of Rāmagirī range, on the lower 1,000 feet plateau, *Sāl* forests were found. The *Sāl* disappears after about 14 miles north of Mālkāngirī, giving

way to the forests of a dry mixed type. Teak was found in patches. The forests were usually very open and grassy but economically of little value except for the purpose of grazing. The hill ranges support dry mixed forest with bamboos, which found a market at Rājahmundry. Bamboos were being floated down to that market in the Sabari and the Godāvāri from Motu.

As Korāput and Potāngi are on the average 3,000 feet plateau and contains peaks above 5,000 feet in height, there was little forest growth above 4,000 feet. Uncultivated grasslands were the usual vegetation of the area. In the more densely populated areas to the south of Korāput, repeated shifting cultivation over years had reduced the forests to a barren soil. The existing forests which were under shifting cultivation contain species such as *Dhaurā*, *Sahaj*, *Bija*, *Toon*, *Simul*, etc. These trees shed their leaves in the hot weather for a very short period.⁷⁶ The probability was that the hills were supported by a sub-tropical evergreen type of forest which had been largely replaced through repeated burning, by species typical of the drier zones. Bamboos found here were of very poor quality and probably they obtained footing as a result of shifting cultivation.

In the Rāyagaḍā subdivision the main geographical feature were the low-laying valleys of the Vamśadhārā and the Nāgāvali rivers and the high hills rising up to nearly 5,000 feet. In the hills and valleys of the Vamśadhārā basin *Sāl* was the dominant species. The forests were of potential economic importance but owing to shifting cultivation large *Sāl* trees and pole crops were became very scarce. In the Nāgāvali basin, except along higher reaches on the left bank, *Sāl* was very rare, and the forests were mainly of the semi-deciduous type found in the central plateau which adjoins hills along the right bank.

The most interesting feature of the Jeypore flora was the distribution of *Sāl*. Over practically the whole of Odisha, *Sāl* forest was dominant on any soil which suits its growth. But it was not as prolific as expected due to several natural reasons as well as due to the effects of human interference. The rarity of *Sāl* in these regions was due to the shifting cultivation which checked its further progress. The absence of *Sāl* on the central plateau was imputed to the fact that if the forests were once of a damper and more evergreen character, the conditions would have been unfavorable for the establishment of *Sāl*.⁷⁷

The neighbourhood of Jeypore and the hills between Nārāyanpātanā and Bissamkatak contains sparse forest, ruined by constant *Poḍu* cultivation and no large trees were left there except the *mohuā*, tamarind and jack trees which the hill people had spared

for the sake of their fruit. Round Korāput and Nandapur the land was so bare that even firewood was scarce.

2.7 Wildlife of Gañjām District

The forests were very rich with wild animals. Among the mammals, tigers (Fig.A-1), man-eaters (Fig.A-2), and leopards (Fig.A-3), were found throughout the district, but chiefly concentrated in the hilly parts of the Ghumsar *Tāluk* and along the line of the hills. In the hills and about the foot were found both the species of the cheetah, i.e., the panther and the leopard. Bears (Fig.A-4), and hyenas (Fig.A-5), were found everywhere. Wolves (Fig.A-6), and wild dogs (Fig.A-7), were also commonly found everywhere in the jungle.⁷⁷ Other smaller mammals like jungle cats (Fig.A-8), badgers (Fig.A-9), jackals (Fig.A-10), pigs (Fig.A-11), pangolin (Fig.A-12), hares (Fig.A-13), monkeys (Fig.A-14), mongoose (Fig.A-15), porcupines (Fig.A-16), and squirrels (Fig.A-17) were also found. It was a common fact during the period that the common striped squirrel was hardly to be seen between Berhampur and Rambhā which was quite common elsewhere.⁷⁹ The Chilikā lake contains otters in considerable numbers. Of the deer variety there were *sambar* (Fig.A-18), spotted deer (Fig.A-19), barking deer (Fig.A-20), mouse-deer (Fig.A-21), *nilgāi* (Fig.A-22) were found on the slopes of the hills and antelope were found in the hills. Buffaloes (Fig.A-23) were found just over the border of Kalāhāndi and sometimes found straying into the district. Elephants were quite abounded in the forests. Being social animals, they used to wander about in herds ranging between 10 to 60 animals doing incalculable damage to the forests by uprooting young saplings and stripping off the bark of valuable trees. They also caused great losses to the villagers by walking through the paddy crops and causing wholesale destruction to the livings of the people. They were becoming a regular scourge to the villagers living within and on the outskirts of the jungle.⁸⁰ Hares (Fig.A-24) were found in plenty in scrub jungles. They were shot in the dark nights during the monsoon when they came out on the dry ridges above the fields. Two species of monkeys were found in the jungles.

Tiger



Fig. A-1.

Leopard



Fig. A-2

Bear



Fig. A-3.

Hyena



Fig. A-4.

Wolf



Fig. A-5.

Wild dog



Fig. A-6.

Jungle cat



Fig. A-7.

Badger



Fig. A-8.

Jackal



Fig. A-9.

Hyena



Fig. A-10.

Pigs



Fig. A-11.

Pangolin



Fig. A-12.

Hare



Fig. A-13.

Monkey



Fig. A-14.

Mongoose



Fig. A-15.

Porcupines



Fig. A-16.

Squirrel



Fig. A-17.

Sambhar



Fig. A-18.

Spotted deer



Fig. A-19.

Barking deer



Fig. A-20.

Mouse-deer



Fig. A-21.

Nilgai



Fig. A-22

Buffaloe



Fig. A-23.

Hare



Fig. A-24.

There were plenty of gamebirds found in the district. Pea-cock (Fig.A-25), jungle-fowl (Fig.A-26), spur-fowl (Fig.A-27), partridges (Fig.A-28), quail (Fig.A-29), plover snipe (Fig.A-30) in fair profusion, wildfowl of all kinds were found in the district. The Chilikā lake and the *Tamparas* were the favourite resorts to be found on and in them. The hill-*maina* and the *Bhimraj* (Fig.A-31) famous for their talking and whistling powers and propensities were also found in the hills. The Herpetology of the district was quite rich and diverse. It includes the amphibians and reptiles. Among the reptiles, some were the poisonous snakes like the cobra (Fig.A-32), Indian krait (Fig.A-33), Russell's viper (Fig.A-34) which were very common in the area.

Pea-cock



Fig. A-25.

Jungle-fowl



Fig. A-26.

Spur-fowl



Fig. A-27.

Partridge



Fig. A-28.

Quail



Fig. A-29.

Plover snipe



Fig. A-30.

Bhimraj



Fig. A-31.

Cobra



Fig. A-32.

Indian krait



Fig. A-33.

Russell's viper



Fig. A-34.

The fisheries along the coast were not as good as those to be found further south and fishing villages were not so plentiful. The table fish that were being caught were the Pomfret (*chandi*) (Fig.A-35) both white and black, the Seer (*Manjiramo*) (Fig.A-36), the Whiting (*Surungi*) (Fig.A-37), the Robal (*Moga*) (Fig.A-38), Mullet (*Koyganga*) (Fig.A-39) and the turtles (Fig.A-40) were sometimes caught in the nets near Gopālpur.⁸¹

Pomfret (*Chandi*)



Fig. A-35.

Seer (*Manjiramo / Mirikal*)



Fig. A-36.

Whiting (*Surungi*)



Fig. A-37.

Robalo (*Moga*)



Fig. A-38.

Mullet (*Khoyanga*)



Fig. A-39.

Turtles



Fig. A-40.

The Chilikā lake was full of fish of a coarse uneatable kind. There were some 16 kinds of freshwater fish in the district, but only 3 kinds, *Soulo* (Fig.A-41), *Baliya* (Fig.A-42) and *Rohi* (Fig.A-43) could attain to any respectable size.⁸² When the floods came down in July and August, they deposit their eggs, and thousands of young fry made their appearance, but were destroyed in great numbers by the natives, who had no idea of sparing them on account of their small size. Both breeding fish and small fry were indiscriminately being caught by means of nets, baskets and other fixed engines.⁸³

Soulo



Fig.A-41

Baliya (*Trout*)



Fig.A-42

Rohi



Fig. A-43

2.8 Wildlife of Korāput District

The forests of Korāput were rich in wildlife. Owing to the unhealthiness of the area, the difficulty of communication and the scarcity of skilled *shikārīs*, it had never become a hunting ground for sportsmen, except those officials whose work took them into the jungles. As no restrictions were placed upon the possession of muzzle-loading guns by bonafide residents of the Agency and as all hill men were passionately fond of hunting, there was certain amount of indiscriminate slaughter of wild animals. It had resulted in a growing scarcity of all kinds of deer, though aboriginal sportsmen do little to reduce the number of tigers and other dangerous beasts. Tigers were found throughout the district. On the eastern borders of Bissamkatak *Tāluk*, they were still a veritable menace and cause much loss to human life. Panthers and leopards were common in all parts of the district and were more destructive to live-stock than tigers. Other representatives of the feline tribe were the leopard cat (*Prionailurus Bengalensis*), the small civet cat (*Viverra malaccensis*), the toddy cat (*Paradoxurus musanga*) and the common jungle cat (*Telis chaus*).

The Dhole or the wild dog was found throughout the district and was regarded as a great destroyer of game. The hyena and jackal were commonly found in the forests. The Indian fox (*Vulpes Bengalensis*) (Fig.A-44) was less frequently met with. The wolf (*Canis lupus*) were found occasionally in the Rāmgiṛi and the Mālkāngiṛi area. The black sloth bears were common and responsible for many casualties among wayfarers. Elephants (Fig.A-45) were rare visitors. They usually appeared in herds in the vicinity of Chandrapur in Bissamkatak *Tāluk* during rains and cold weather coming across the Bālligudā *Tāluk* of Gañjām where there were resident herds. They were always seen within ten miles of Gunupur, but never seen in the Korāput sub-division.⁸⁴

Fox



Fig. A-44

Elephant



Fig. A-45

The Indian buffalo (*Bos bubulus*) was found in small numbers in the north of Nawarangpur *Tāluk* and in larger herds in the Mālkāngirī *Tāluk* especially in the vicinity of Bālimela and Koṇḍākamberu. The bison (*Bos gaurus*) (Fig.A-46) were more widespread and found in the forests of Mālkāngirī, Rāmagiri and Umarkot. Among the deer, *chital* or spotted deer (*Cervus axis*), *sambar* (*Cervus unicolor*) and barking deer (*Cervus muntjac*) were well represented. As with the most other game the vast forests round the Koṇḍākamberu were the best fields for these animals. *Nilgāi* were found rarely in the Mālkāngirī and the Nawarangpur *Tāluk*s. The four-horned antelope (*Tetraceros quadricornis*) (Fig.A-47) and the swamp deer (*Cervus duvauceli*) were found very rarely. The chinkara appeared to be extinct in the district. The mouse deer (*Trangulus meminna*) were found scarcely in most parts of the district. The black buck (*antelope cervicapra*) (Fig.A-48) were apparently confined to the Pānnābeda *Muttāh* in the extreme north-east of the Nawarangpur *Tāluk*. Wild boars were found in nearly all parts of the district.

Bison



Fig. A-46

Four horned antelope



Fig. A-47

Black buck



Fig. A-48

Among primates, the common langur (*presbytes entllus*), the common bandar (*macacus rhesus*), and the bonnet monkey (*macacus radiatus*) were found in good numbers. The common Indian crocodile was found in the waters of the Kolāb, Māchkuṇḍ and Īndrāvati. Among smaller specie were the common stripped squirrel, the large Indian squirrel (*Sciurs maximus*), the common Indian porcupine, the common Indian hare, grey mongoose and the long-tailed mongoose, the honey badger (*Mellivora indica*) and the otter (*Lutra vulgaris*) rarely occurred.

Peafowl were common all over the district. *Śavaras* used to catch the birds by chasing. The red and grey jungle fowl were fairly common. Spur fowl were frequently met with, while grey partridges were rather rarer. Green pigeon and blue imperial pigeon were more common in most part of the district. (Appendix-I)

2.9 Mineral Wealth of Gañjām District

Up to 1918 the district of Gañjām was not examined by the Geological Survey of India. During that period the only available sources of information were:

- (a) *A Brief Account of the Circārs on the Coast of Orissa* by Dr. Heyne,
- (b) Notes, chiefly Geological, of *A Journey through the Northern Circārs in the year 1835* by Dr. Benza, and
- (c) Notes by T.J. Maltby made during a brief visit to Mahendragiri in the year 1870.⁸⁵

A major part of the district was covered by the Eastern *Ghāts* hill ranges. The important rock outcrops, which predominates the district were mostly crystalline, comprising gneisses of charnockites and Khondalites.⁸⁶

Sporadic reserves of bauxite were found at Pāralākhemuṇḍi, Rāmagiri and Mahendragiri areas. Kaoline was found near Sāmantrāpalli and Jillindā. Iron-ore had been reported between Gochhāparā and Katrāngiā but the deposits were of little commercial value. Pockets of manganese occurring within the Khondalite suite of rocks had been found at Chandipalli, Kabisuryanagar, Purusottampur and Kodālā.⁸⁷ Large number of small deposits of natural black sand concentrates consisting of monazite, ilmenite, zircon, sillimanite and rutile had found between the Rushikulyā river mouths to Gopālpur. All the rock types in the district were used for building purposes. Khondalites were used for building purposes whereas quartzites and charnockites were used for the construction of bridges, roads and railway ballast.⁸⁸

The irregular and invincible nature of the hilly terrains of western part of the district covering Bālligudā and G. Udayagiri was an impediment for systematic

geographical mapping. As such, the information regarding economic minerals in the area was incomplete. Being a part of the Eastern *Ghāts* group, the common bearing of rocks includes granites of different description, Khondalite, quartzite, laterite and calc-granulite.⁸⁹ Pyroxene granulite and charnockite which were compatible for road and building construction were sparsely found in the region.

2.10 Mineral Wealth of Korāput District

The main geological feature of Korāput was divided into two parts i.e. the 2,000 feet plateau of Jeypore with its much lower extension into the Mālkāngiri *Tāluk*, and the high hilly region of the Eastern *Ghāts* laying between the Jeypore plateau and the Vizagapatam coastal plains.⁹⁰

At several places of Korāput plateau, particularly near the district headquarters, large and small sized deposits of china-clay of an inferior quality found. Kaolin also found in Nawarangpur and Rāyagaḍā.⁹¹ Owing to the refractory nature of the clays, it was used as fire clays and in the manufacture of coarse porcelain wares and stoneware drainpipes. The river alluvium near Jeypore and Rāyagaḍā carries vast quantities of pottery clay. It was used by the local tile factories for the manufacture of roofing and paving tiles, drainpipes, flowerpots, vases, etc.

Placer gold was found in Govindapalli, Kyangu and Kollaru. Gold was washed in a small way in the Rangapāni *nalā* and its various tributaries in the neighbourhood of Govindapalli and the Kolāb river below its junction with the former stream, east of Kyang. The gold was in the form of very fine particles which were disseminated in the river sands and gravels that settle down with 'black sands' on panning.⁹²

Graphite in small quantities was widespread in the rocks of the Khondalite series. Two small deposits had found at Chuchkona near Rāyagaḍā. Graphite was commonly used for giving a finish to the ordinary earthen pots. It was also found in the Merangi, Kāsipuram and Sālur *Zamindārīes*. But it had never been exploited with commercial success.⁹³

Iron consisting of hematite and limonite had been discovered in the Hirāpur hills, seven miles west of Umerkote. These iron-ores had limited use on account of high phosphorous. The iron-ore was rudely smelted by the natives in many villages of Umerkote, Kotpāḍ, Rāmagiri and Korāput *Thānās* of the Jeypore estate, in the usual way for the manufacture of implements and tools.⁹⁴

Limestone deposits of flux grade were found in the Siriveda Gupteswar areas in the Rāmagiri and Kotpāḍ *Tehsils*. Cement grade limestone deposits with huge reserves

were found near Nandivada, Kottameta and the Mālkāngiri subdivision and Potāngi Tehsil.⁹⁵

The most important manganese-ore deposits were found at Kuttingi, Devajhollā, Mandāra, Kuttili and Santomra in the Rāyagaḍā, Gunupur and Korāput Sub-divisions.⁹⁶ Yellow and red ochre were found near Baipārigudā. The mineral was used locally for colour-wash.

Coarse potstones were quarried in many places along the margin of the Eastern *Ghāts* west and south-west of Jeypore. They were easily carved and used in temples, manufacture of idols, grindstones and for many other purposes. Near the boundary with the Kalāhāndi state, purple and grey slates which were good enough for roofing and flooring purposes occur in the exposure of Cuddapah rocks.⁹⁷

The British were conscious of the value of exploration of natural resources and put a systematic approach towards mapping, classification and cataloging the geographical, environmental and ecological factors of all the areas they colonized. From academic as well as economic points of view, such efforts were proved to be useful during the British rule and having strong bearings upon the state policies in the post-independence period to follow. The plans for felling of plants for railways, industrial and domestic applications, the administrative measures for protection of forest including plants and animals and the process of framing of statutory provisions for taxation on forest and mineral resources and the execution of such policies and statutory provisions, all were attributable to the information systematically created from such study on the subject which is overly termed as ‘Forest Administration’.

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