

CHAPTER - III

Physical Environment

PHYSICAL ENVIRONMENT

PHYSIOGRAPHY :

The region from relief point of view is not a homogeneous area, if we take into account of its geographical personality and setting. The most conspicuous aspect is the presence of a number of hills and dales which provide an undulating landscape to the area as a whole. There are 5 major rivers about whose nature of flow discussions have been made later in this chapter.

Morphologically the region can be divided into four parts :-

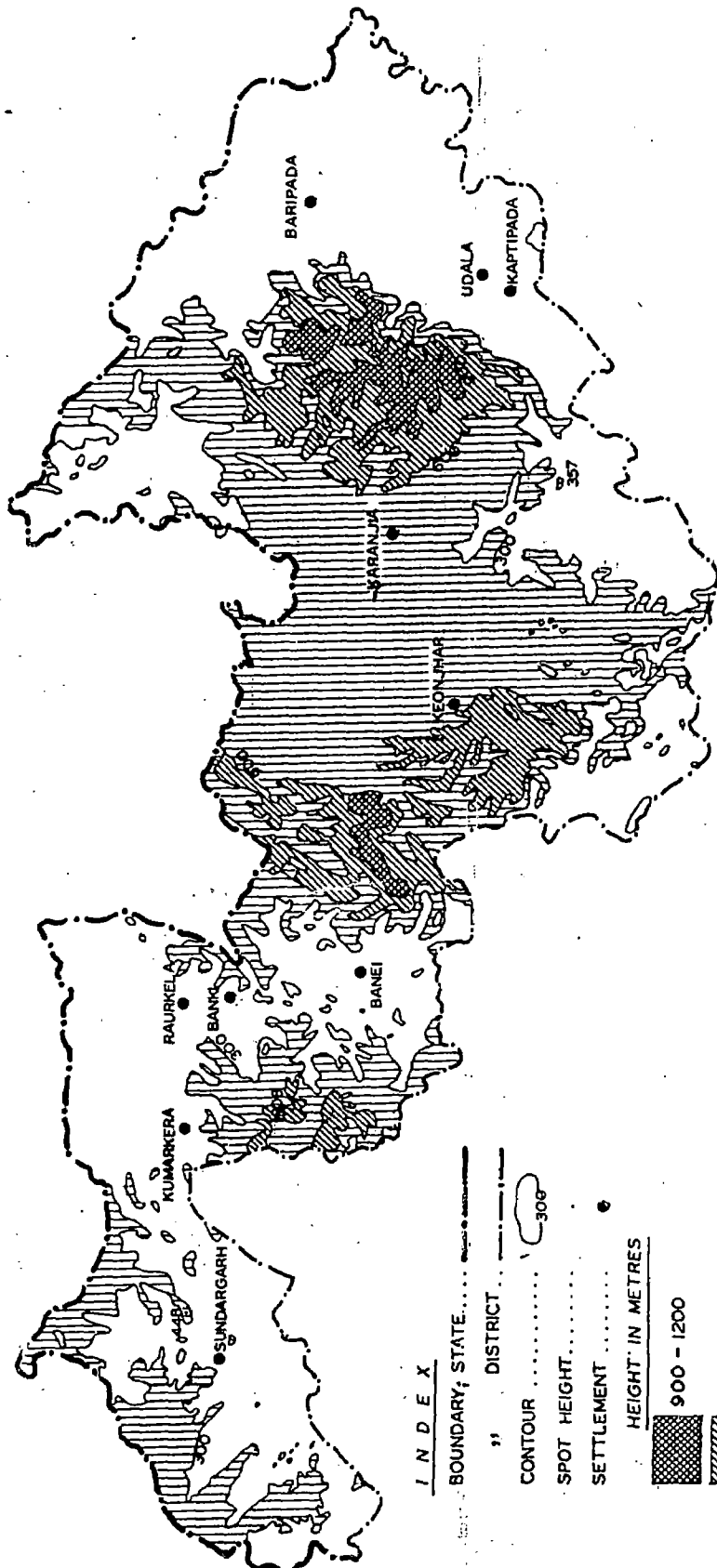
- i) The river valley and plains.
- ii) The mountainous country.
- iii) The rolling uplands.
- iv) The subdued plateau.

i. THE RIVER VALLEYS AND PLAINS :

(a) Subarnarekha and Budhabalanga valleys and flood plains (Baripada Plain) The area is supposed to have been built up in the first instance by marine deposits in the form of a broad continental shelf. In subsequent periods due to upliftment the river-borne deposits were spread on the horizontal strata. Thus it has taken the outward form of being entirely built up by the river action. With a

NORTHERN ORISSA

RELIEF



I N D E X

BOUNDARY; STATE.....

" DISTRICT.....

CONTOUR..... 300

SPOT HEIGHT.....

SETTLEMENT.....

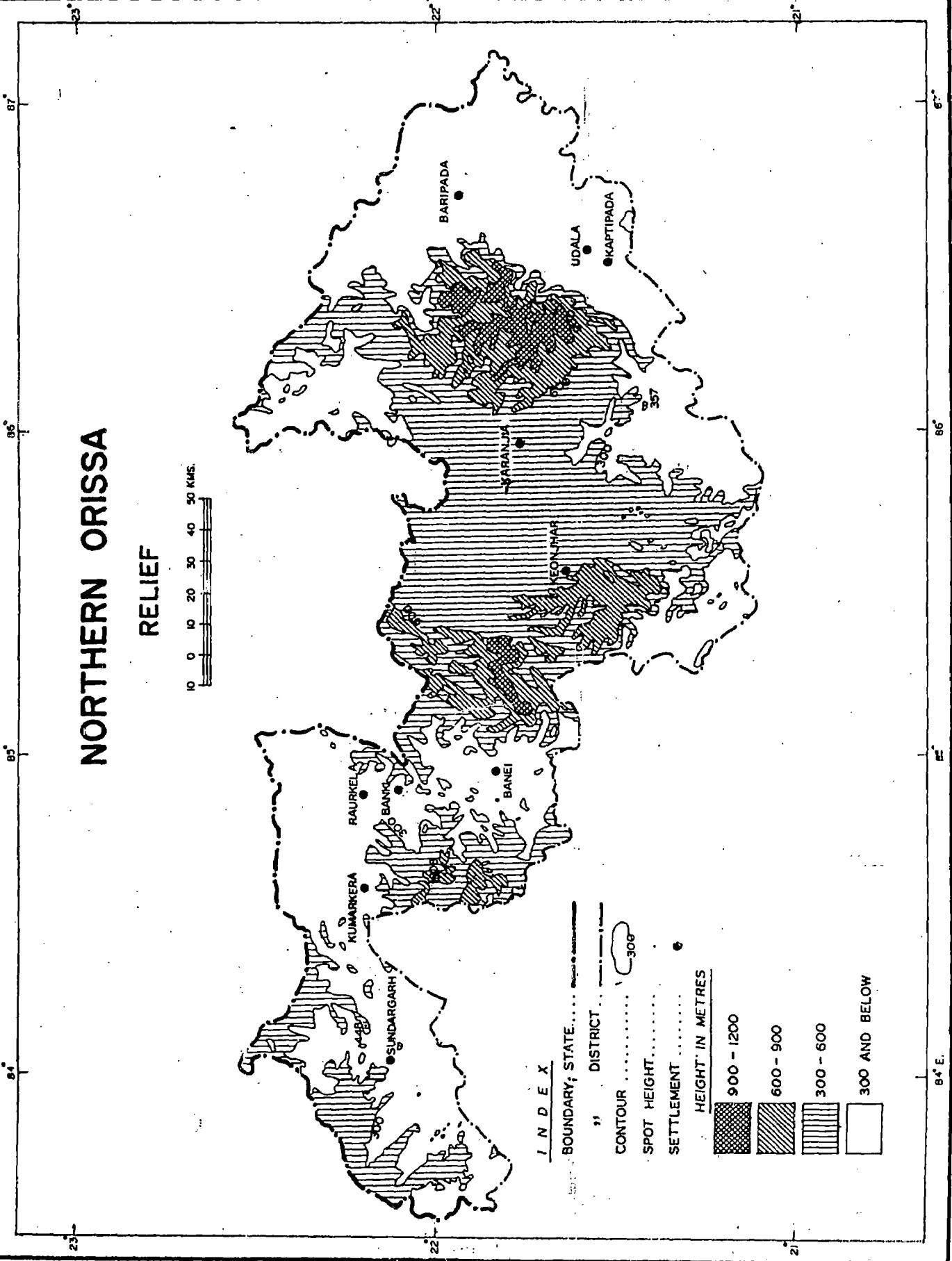
HEIGHT IN METRES

900 - 1200

600 - 900

300 - 600

300 AND BELOW



comparatively low fertility and high elevation, as against the coastal plains, the carrying capacity per unit area of land here is limited. Red soil with low fertility is frequently met with towards the western plains. It is as a result of proximity to the Similipal Hills. The important urban centre, Baripada town, lies by the side of the Budhabalanga. Therefore, it may be named as the Baripada plains.

(b) **Valley of Brahmani** : It runs north-south to a few miles from Panposh area till it enters the wooded mountainous tract of the Banei sub-division. Geographically this section may be called the plain of Panposh. The relief is characterised by an elevation approximately 180 to 210 metres above the sea level while the peaks in the east do not exceed in height 600 metres.

ii. **THE MOUNTAINOUS COUNTRY** :

This sub-region is largely a mountainous tract with many lofty hills. It is a part of the Indian peninsula. Morphologically this mountainous region again may be sub-divided into different sub-units :-

a) **The Common Interfluves of the subarnarekha, the Budhabalanga and the Baitarani** : The interfluves comprise the Similipal massif, a group of hills extending over an area of 1555 sq.kms. The Meghasan hill which rises to a height of 1166 metres is situated in the southern extremity of this group. The other hills are the Dhudruchampa (1010m.), Gorumahisani (904m.), Badampahar (833m.), Chahala (777m.) and Balidiha (623m.). They are almost circular in extent. The dome-like shapes have given rise to radial pattern of drainage which is unique in Orissa. The

topography offers a serious obstacle for lines of communication between the east and the west.

(b) **The Nilgiri Hills** : This sub-unit is an isolated hilly section situated on the extreme east of the region. It is part of the Eastern Ghats surrounded by the plains of Baripada in the west, Anandapur in the south and Northern coastal plain in the east extending over an area of 681 Sq.Kms which rises to a height of 606 metres.

(c) **The Baitarani-Brahmani Interfluve** : In this third sub-unit the trend of the mountainous interfluve of the area is from north to south. It has several peaks of which Badamgarh (1075 metres), Mankaranacha (1118 metres), Kunratir (1064 metres) in Bonei Tahasil Of sundargarh and Gandhamardan (1002 metres) of Keonjhar are important. It can be described as a polycyclic region. This part of the region is cut off on all sides by densely forested hills which are crossed by narrow river valeys forming beautiful gorges. Both the rivers of Brahmani and Baitarani dissect the region into several parts but the rivers are neither navigable nor of any help to irrigation due to the rocky and rugged grade of river beds and irregular water flow in the channels. The region is completely devoid of forest cover due to shifting cultivation practised by the Bhuyans and Juangs of the area. Agriculturally this is one of the most back-ward regions of

the state. Economically, however, it is very valuable as it contains the important deposits of such minerals as iron, manganese and mica.

(d) **The Brahmani-Mahanadi Interfluves :** The mountains in this interfluve region run almost parallel to the water shed of the Brahmani and the Baitarani discussed above. Except in the north, this region is highly eroded by the tributaries of the Mahanadi and the Brahmani and is, therefore, low in elevation. It is not a continuous mountain chain. The mountains are covered by a thick growth of bamboo forests due to high rainfall and suitable soil conditions.

iii. **THE ROLLING UPLANDS :**

These uplands are included in the sub-mountain zones and have mostly a rolling undulating topography with elevation varying from 152 to 305 metres. It can be further divided into the following sub-units.

(a) **The Rairangpur Rolling uplands :** The chief peculiarity of the upland is that unlike other areas it drains to the north and morphologically, it is completely cut off from the other drainage systems of Orissa.

(b) **The Baitarani Rolling Uplands :** It is at the fringe of the Keonjhar plateau and is of little importance for its small size.

(c) **The Rolling uplands of the Brahmani Basin (Rourkela uplands) :** These uplands are on the eastern slopes of the Mahanadi-Brahmani interfluves and in the confluence of the Sankh and the Koel rivers. They can also be called the Rourkela uplands. This region has become economically important because of the Rourkela Steel Plant and it is one of the most advanced areas of the region in the field of industries.

The Rajgangpur undulating open upland tract of this sub-unit lies in the east intervening between the Ranchi Plateau in the north and the Mahabit range in the south with a general elevation ranging from 210 metres to 305 metres within which there are a number of isolated hills and sharp ranges created by the river action of unimportant streams draining towards the Sepal river in west and the Mandira-Sankra drainage in the east.

(d) **The Sundargarh upland :** It is in the centre dissected by the Ib drainage system which has provided it with relatively wider valleys and dales separated by isolated hills and ranges besides, in the mouth open and cultivated plain tract. The highest peak of the sundargarh upland is Didrapahar (765 metres) lying in the border of Sundargarh and Bonei, The other smaller hills are Bhaisamunda (681 metres), Kichimiri (625 metres) and Mahabir (568 metres).

iv. THE PLATEAUS :

(a) In the western part of the study region lies the Hemgiri Plateau area having centrifugal streams from an elevation of about 350 metres extending in a considerable hilly terrain in the north and in the south to a relatively plain landscape with about 215 metres of elevation above sea level drained by the Basundhara and Ichha rivers of the Ib system.

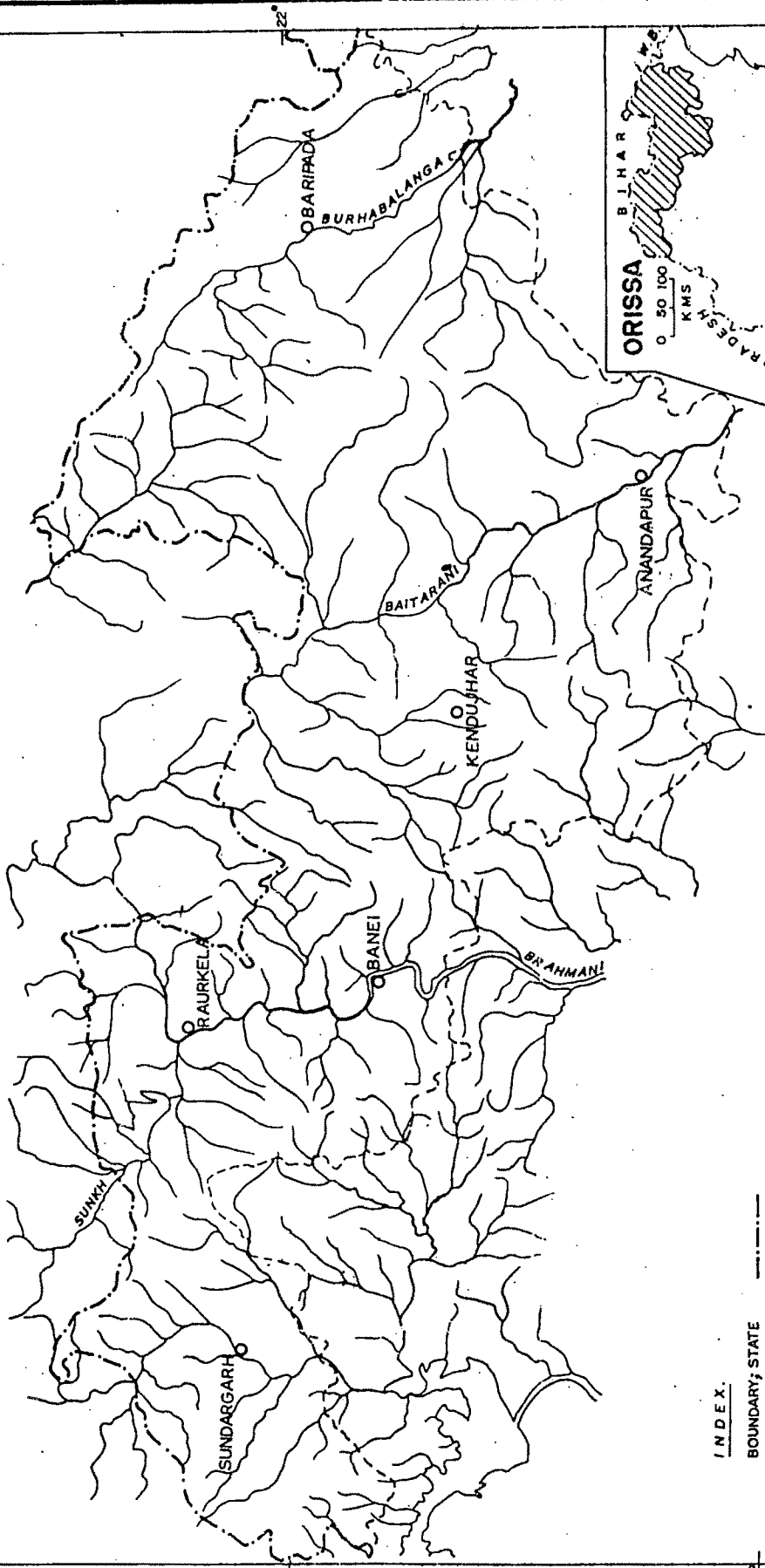
(b) The Keonjhar Plateau is another part of the study region. It is drained by the Baitarani and presents unique feature of a high plateau. It ranges in height from 300 to 600 metres. It is delineated by the Similipal mountains in the east, the Mankaranacha mountains in the west, and then it rapidly merges into the rolling uplands of the Baitarani in the south. In the north the Singhbhum and Ranchi highlands form the boundary of the region. Thus morphologically it is a well defined region. The region is very rich in mineral resources like iron ore, manganese and limestone. Besides, this extensive tableland is quite suitable for pasture and cultivation.

DRAINAGE :



The whole region is drained mainly by five major rivers i.e. Ib, Brahmani, Baitarani, Budhabalanga and Salandi. River Ib, a tributary of Mahandi, collects water from the western part of the region and the central hill

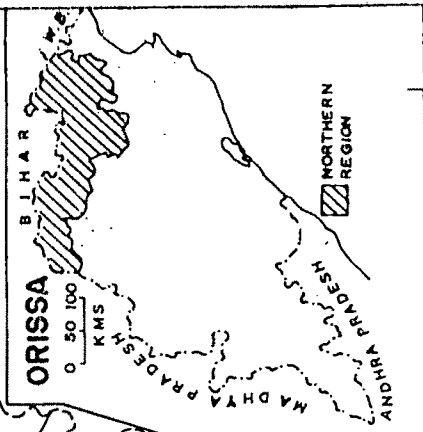
NORTHERN ORISSA

DRAINAGE



INDEX.

- BOUNDARY, STATE ———
- || DISTRICT - - - - -
- RIVER AND STREAMS 
- WATER RESERVOIR 
- SETTLEMENTS ○



84° 85° 86° 87°

22° 22°

ranges serve as the watershed of the river Brahmani on the south and Baitarani on the north. The river Budhabalanga and Salandi collect water from the central part of Similpal hills. Apart from these five rivers some other small rivers also contribute towards draining of water in the region. All these rivers flow as down-streams with steep gradient carrying large quantities of water during the monsoon season. The rivers, however, are not navigable in any season.

CLIMATE :

The northern Orissa enjoys, on the whole, a dry Summer followed by a rather well-distributed monsoonal rainy weather. The eastern part of the region is slightly humid in comparison to the western part. As the state of Orissa is located on the eastern coast of India, it does not come under the direct path of the monsoon with the result that monsoon rain is much lower here than in West Bengal.

22 39 29

The maximum rainfall (about three fourth of the year) falls in the two months of July and August. The rainy season starts from early June. Rainfall helps in lowering the dry temperature and as rainfall is well distributed during the monsoon season from June to September the weather is tolerably good. Average annual rainfall varies from 140 cms. to 192 cms. During the pre-and post-monsoon season tropical storms and depressions originating in the Bay of

NORMAL RAINFALL

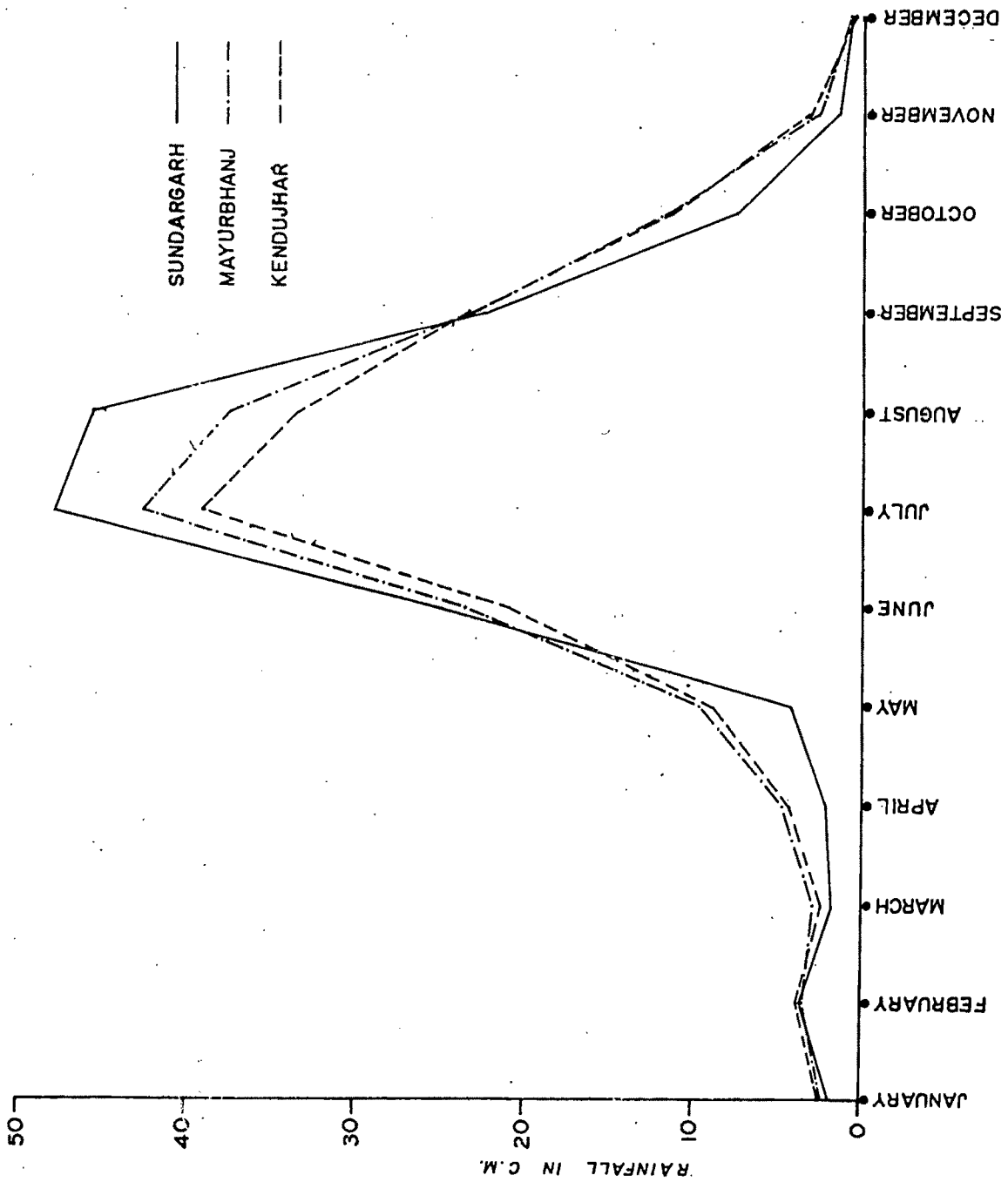


Fig - I

Bengal pass through the eastern and central part of the northern Orissa after crossing the Coastal tract of Orissa.

Apart from the total annual rainfall, the total number of rainy days is also important. This is because sometimes a high concentration of rainfall in a small number of days causes floods. The highest number of rainy days are experienced in the Karanjia of Mayurbhanj district. It is about 84.7 cms. Also the Keonjhar, where 157.5 cms. of rainfall is experienced in 40.5 days. The districts of Mayurbhanj and part of the Keonjhar experienced the high annual rainy days.

The number of monsoon rainy days and winter rainy days will be clear from the following table :

Annual Monsoon And Winter Rainfall and Rainy days in some important stations.

Stations	Rainfall(normal)			Rainy days(nos.)		
	Annual	Monsoon	Winter	Annual	Monsoon	Winter
Keonjhar	157.5	108.4	4.3	40.5	54.0	2.9
Mayurbhanj	178.4	128.8	3.6	73.2	63.3	3.5
Sundargarh	172.3	140.9	3.8	73.1	59.2	3.2

Source : 'B.N.Sinha; 'Geography of Orissa', National Book Trust, India, New Delhi (1971) P.22.

TEMPERATURE IN DEGREE IN CENTIGRADE

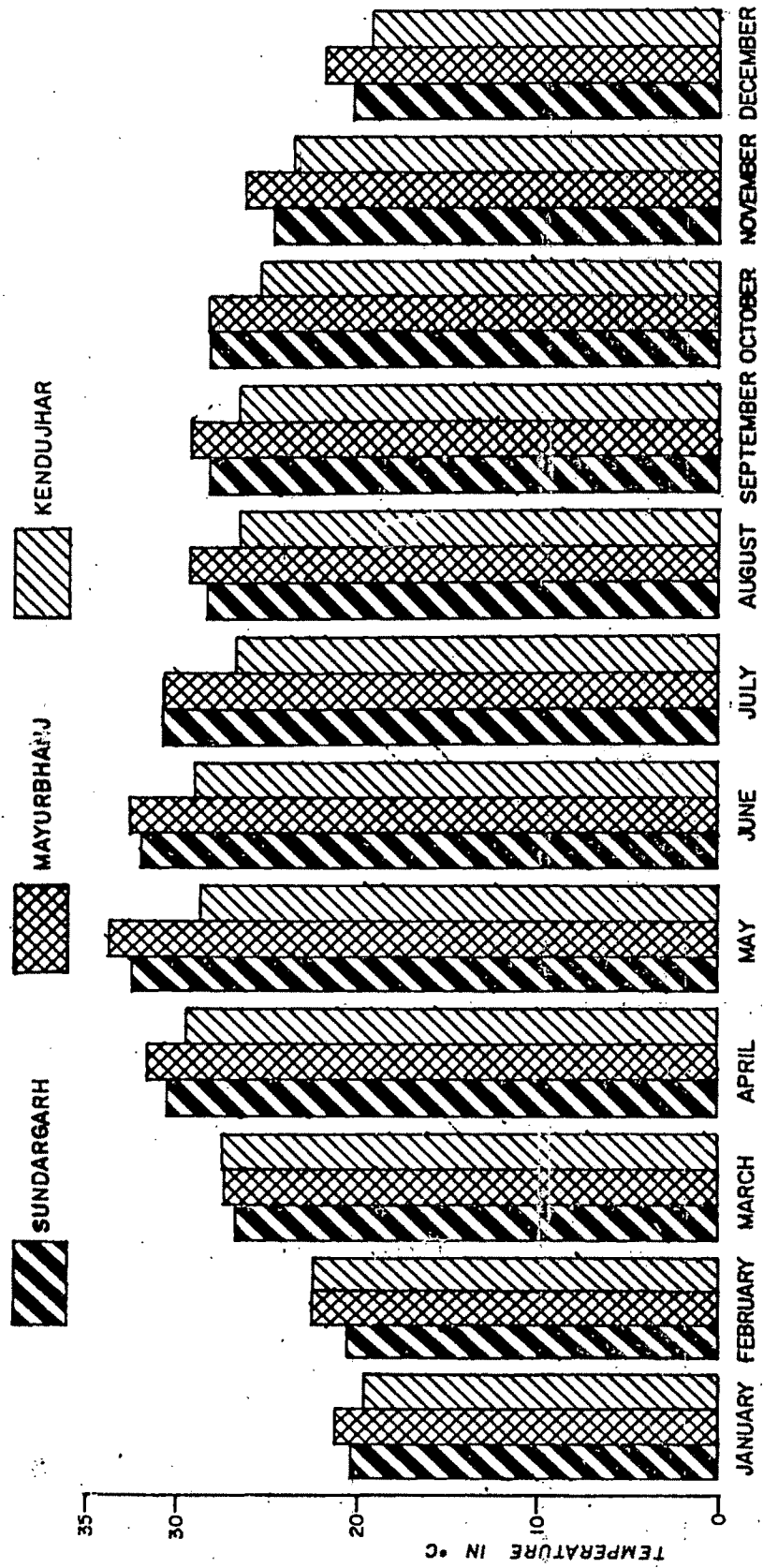


Fig. 2

The mean annual temperature of the area is influenced by its latitude, elevation and proximity to the sea. The hot weather season is from March to May. May is the hottest month with mean daily maximum temperature recorded at 41°C , and the mean daily minimum standing at 27°C . From October both day and night temperatures begins to decrease and by December the coldest weather is experienced when the mean daily minimum temperature is 13°C . Sometimes the minimum temperature drops to 7°C .

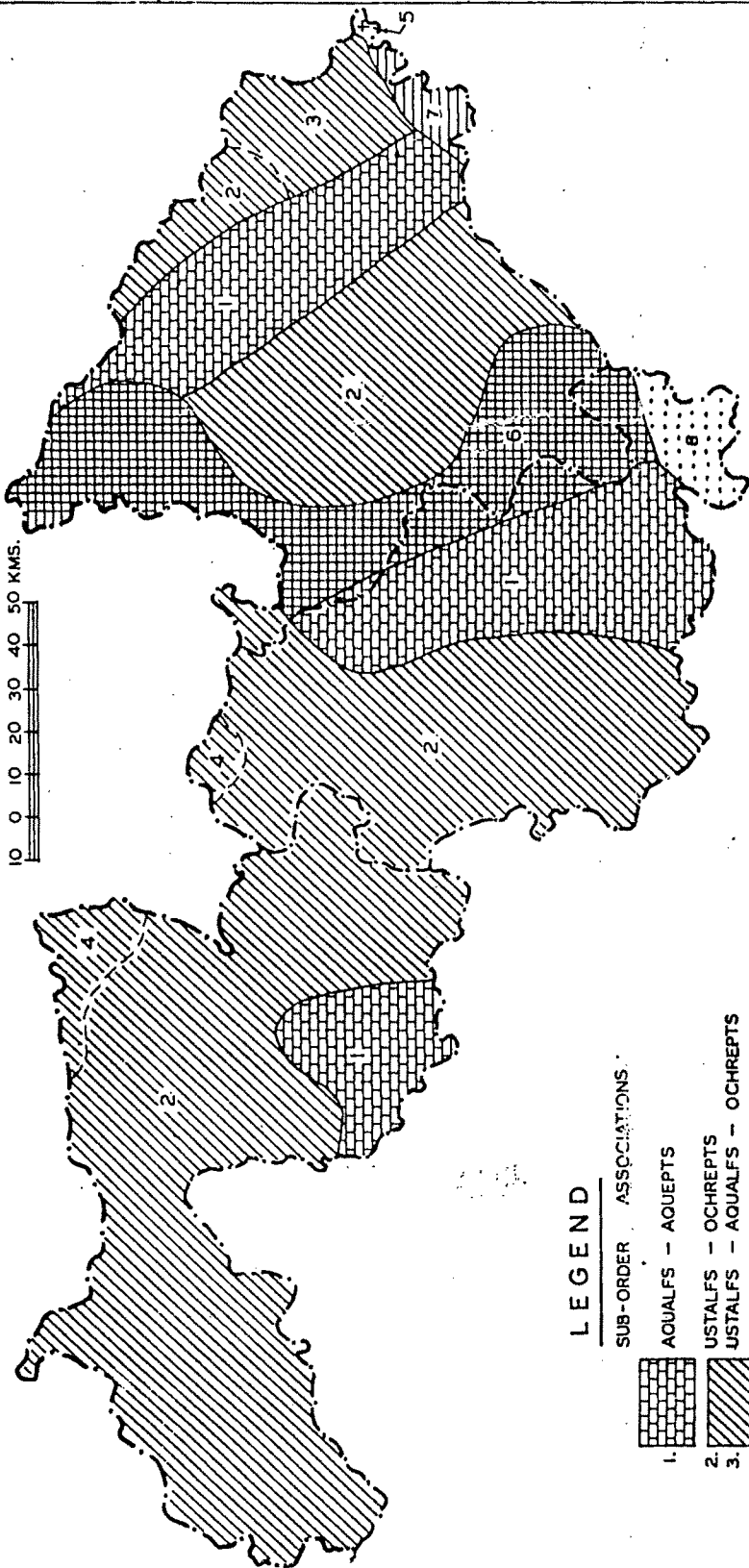
The maximum and minimum relative humidity of the region is 85% and 32% respectively. The high percentage of humidity is observed in northern Orissa in comparison to other parts of the State.

SOIL :

Geologically the northern Orissa consists of the iron deposits of the Upper Dharwar Series. The Soil of the area is mostly reddish and lateritic derived from the underneath igneous and metamorphic rocks due to fluvial action under humid tropical conditions. The hilly tracts are covered with laterite Soil. In this area due to the precipitation of silicate and sesquioxides which is accelerated by the presence of lime, helps in the formation of red soil which is distinguished from the laterite by a higher percentage of silica and some bases. There is a small patch of black cotton soil in the south. To the west of the Ib river, the soil is an admixture of red and black soil. Red soil is predominant in the Bamanghati and Bonai

NORTHERN - ORISSA

SOIL



LEGEND

- SUB-ORDER ASSOCIATIONS:
- 1. AQUALFS - AQUEPTS
 - 2. USTALFS - OCHREPTS
 - 3. USTALFS - AQUALFS - OCHREPTS
 - 4. USTALFS - OCHREPTS - ORTHENTS
 - 5. FLUVENTS - PSAMMENTS - ORTHENTS
 - 6. ORTHENTS - OCHREPTS - USTALFS
 - 7. AQUEPTS - AQUEPTS
 - 8. OCHREPTS - ORTHENTS

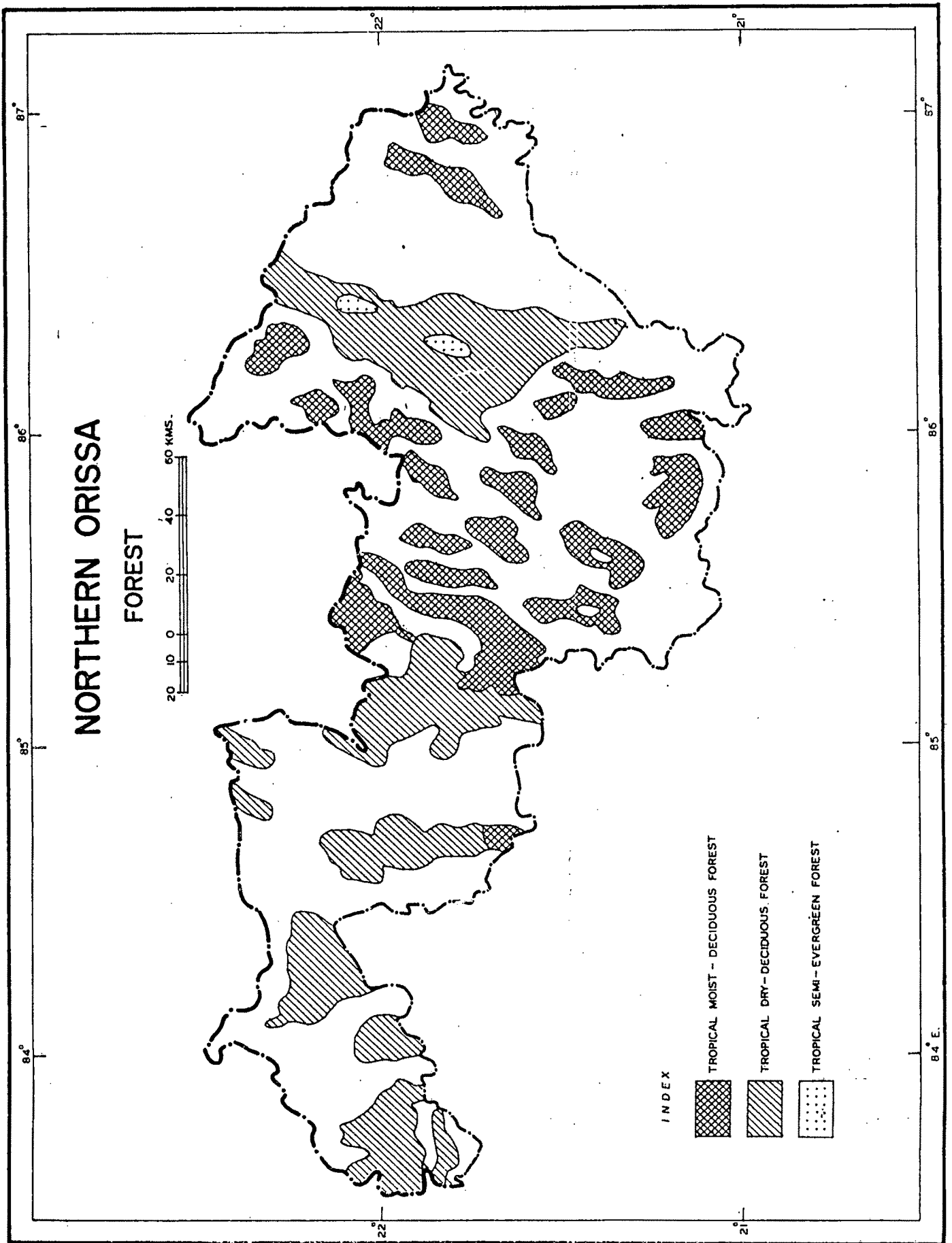
sub-divisions and in the Koel and Sankh basins of Sundargarh. In the Budhabalang basin of the Badar Sub-divisiion of Mayurbhanj Planosal soil is predominant. Lack of protective action of line washes away silica, high summer temperature prevents the formation of humus, lack of humus does not allow podolisation these and poor drainage conditions help in the formation of this hard clay pan. The eastern part of the region, particularly the eastern part of Mayurbhanj is composed of alluvial soil. Also along the valley of the Ib and valley of the Brahmani in the open plain country is characterised by rich and fertile soil formed out of the silts deposited through ages.

FORESTS :

About two-third of the area of the region i.e. about 13197 sq.Km. in area is covered by rich forest of tropical deciduous type. Following the terrain, rainfall pattern and soil type, the forests can be broadly classified into two major vegetation types.

(i) Tropical semi-evergreen dry deciduous types :

About half of the area of the forest cover are characterised by a dense forest mixed with many climbers and trees of which Sal (shorea robusta) is the dominant species. Besides Sal, other important trees are Asan or Sahaj (Terminalia Tomentose), Bija or Piasal (plerocarpus marsupium) and Kurum (scheichare Trijuga), Mahula (Baisia latifolia), Kendu (diospyros melan-xylin), Sisoo (Dalbergia latifolia), Khair



(*Acacia catechu*), and Bandhan (*Ougeinia Dalbergioides*). These are some of the common species found all over. The eastern half of Banei sub-division, Rajgangpur range of Sundargarh sub-division, Kanjapani and Bansapal of western Keonjhar contain better quality of forest vegetation. The principal grass vegetation in the forests are Sabai or Panasi (*Enlaliopsis binate*) which is used for paper pulp and rope making. It is also used as fodder in its young stage. Kendu leaf is an important forest resource and it contributes significantly to the revenue of the region and job to the tribal families of the region. The most striking feature of this region is the absence of bamboo groves. The semi-evergreen dry deciduous forests are confined to the region of high elevation and precipitation.

ii. Tropical semi-evergreen moist deciduous types : The eastern half of the region itself covers about 80 percent of the total forest land of the area. The sal (*Shorea robusta*) forest is most common and is concentrated almost whole of Mayurbhanj district and in about half of Keonjhar district. The forests in general can be grouped under moist-deciduous semi-evergreen type in which species like Sal, Piasal, Asan, Kurum, Sisoo, Gambhari etc. are common. Sabai grass is grown in plenty in the interior plain tract. Forests are destroyed by fire due to shifting cultivation practices of the tribal people. Minor forest products of the region are cocoons, lac, myrobolan, Sonari bark, arrowroot, honey, mahua flowers and seeds. The sal is famous for its

valuable timber and many other uses, like the use of its leaves for making plates which are used to serve dishes. Use of Sal branches as fuel and for production of very high grade charcoal is noteworthy. One also finds good growth of cane in this region. Indiscriminate felling of trees for different commercial uses, burning wood for charcoal as well as ahrub cutting and leaf collection along with jhooming (Podu or shifting cultivation) and tassar cultivation have brought significant deteriorating change in the forest cover of the region.

MINERAL :

The region is one of the richest in Orissa so far as economic minerals and rocks are concerned. The most important ones are iron-ore, manganese ore, dolomite, chromite, kaoline, lead ore (galena), china clay, and asbestos. Most of these are exploited now in large scale. Bauxite derived from laterization of shales with more than 45 per cent of alumine is widely found in the Sundargarh and Keonjhar districts. There is a fair stretch of coal deposit in the Homgir coal fields which forms the connecting link between the Ib river coal fields in the east and Raigarh coal fields of Madhya Pradesh in the west. The Singhbhum-Keonjhar-Banei Iron ore belt which extends into the eastern part of the region upto Gorumahisani, Badampahar and Suleipat of Mayurbhanj, is regarded as the most important group of deposits of iron-ore in India. Large deposits of high grade iron ore are also reported at places in the

Gandhamardan hills. The development of iron ore has been adversely affected by two major constraints. The first one is the lack of a proper rail link with the important industrial centres and ports and the second one is the absence of mineral-based industries in the surrounding area. The iron ore reserves located at Gorumahisani, Badampahar and Suleipat have been exploited by the Tata Iron and Steel Company (TISCO). Extensive deposits of manganese ore are found both in Sundargarh and Keonjhar contributing 40 percent of the Indian manganese reserve for which Orissa is famous for exporting this ore to foreign countries. It is Keonjhar which has brought Orissa into international map for exporting of chromite to the U.S.A. and Japan. There has been indiscriminate exploitation of limestone and dolomite in the district of Sundargarh for cement industry. China-clay deposits are found around Karanjia and Joshipur in Mayurbhanj district. Besides these, there are a large variety of minerals and rocks of commercial significance in the region. The discovery of gold reserve at Telkoi in Keonjhar district would place the region as a leading mineral belt of India with infinite possibilities of multi-dimensional development in various sectors of the economy. With this huge possession, the region has achieved the unique distinction of being the most important mineral-bearing region in the state as well as in the country as a whole.

WATER RESOURCE :

On account of existence of a good number of large perennial rivers like the Ib, the Brahmani, the Baitarani, the Budhabalanga and the Salandi and due to presence of a number of springs in the region as a whole, it is advantageous to the inhabitants to enjoy adequate water resources. As the economy of the region is primarily inclined to agriculture, the presence of such big rivers with favourable relief for various irrigational projects provides adequate environment for gainful agricultural occupation.