CHAPTER 1.

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GENERAL DESCRIPATION.

The district of Dhanbad was created under Government notification no. A. 9911,dated 24th October ,1956, and came into existence from 1st of November ,1956. The bulk of the area formed previously the Dhanbad sub-district with an Additional Deputy Commissioner as the administrative head . The areas of Chas and Chandankeary thanas from purulia subdivisionof the former Manbhum district in Bihar were transferred to the state of the West Bengal in implementation of the recommendations of the States Reorganisation commission. The status of Dhanbad sub-district was changed into that of a district and the post of a Deputy Commissioner.

The present district of Dhanbad has an area of 2,885.2466 km^2 . According to the 1961 census the total population of the district is 11,58,610 persons.

The principal town and administrative Headquarters is Dhanbad situated almost in the centre of the district. The district consists of two subdivisions, namely Dhanbad Sadar and Baghmara . The Sub-divisional Officer, Baghmara has his headquarters at Dhanbad temporarily as the site of the headquqrters has not yet been finalised.This subdivision was created only after the transfer of the areas of Chas and Chandankeary .Dhanbad district continues to be within Chotanagpur Division.

ORIGIN OF THE NAME OF THE DISTRICT.

The district derives its name from Dhanbad the headquarters.There is no authentic record to show how Dhanbad took its name .One of the theories popular among the public is that, this area was famous for the growth of “Baid Dhan “ or Baid paddy . There are two kinds of paddy in the district. One is called ′Baid ′ which ripens in kartik (October- November). Another far-fetched theory is that the name of Dhanbad is derived from Dhan, a Kolarian tribe that lived in this area. “Baid” has perhaps been taken from the Urdu word “Abad” meaning occupied . Dhanbad may mean the place populated by “Dhan” a kolarian tribe or occupied by “Dhan” (paddy) in general. The place may have been named in the same way as Jehanabad , Aurangabad, etc. There are several similar place-names in this district like Dharibad ,Chhatabad, Loyabad,Parbad,etc.

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The district was first known as ′Dhanbaid′. It is believed that Mr. Luby,I.C.S., officially and was permitted to drop the letter′i′ from ′baid′.

BOUNDARIES.

This district is bounded on the north and north-east by the Barakar river which separates it from Hazaribagh, Santhal Pargans and Burdwan districts, on the south there is no natural boundary . The limits of Chas and chandankeary thanas and a portion of the Damodar river now constitute the boundary . On the west it has Hazaribagh district . On the east the Barakar river forms the boundary.

THE HISTORY OF THE DISTRICT AS AN ADMINISTRATIVE UNIT AND CHANGES IN ITS COMPONENT PARTS.

This history of the district as an administration unit and the changes in its component parts have been covered elsewhere. For revenue purposes there are four revenue thanas in the Sadar subdivision, namely ,Jharia,Gobindpur, Tundi and Nirsa and two in Baghmara subdivision, namely ,Chas and Topchanchi. For the purpose of the police administration, the district has been subdivided into four circles : (i) Dhanbad, (ii) Gobindpur ,(iii) Sindri, and (iv)Katras. Dhanbad circle has Dhanbad,Kenduadih and Jogta police-stations, Gobindpur circle has Gobindpur, Tundi, Nirsa and Chirkunda police-stations, Sindri circle has Sindri,Jharia, Jorapokhar and Balliapur police-stations.

The above circles are undre the jurisdiction of Dhanbad Sadar subdivision.

Katras circle which is in Baghmara subdivision has the following police-stations undre it : (a) Baghmara , (b) Topchanchi, (c) chas, (d) Chandankeary and (e) Katras.

NATURALS DIVISIONS.

Three district characteristics of the landscape are preceptible.They are: (i) the ranges of ridges sent out by the parasnath in the remote northern and north-western region occupying an area of about 84 square miles , (ii) the coal-fields having approximately an area of 200 square miles in the southern and eastern parts and (iii) the series of uplands and intervening hollows with isolated bare ridges of varying elevation dotted here and there between them.

Broadly speaking Dhanbad district has two physical division ,southern and northern . The southern portion is the colliery area with the industrial towns and the northern portion is the area of hills and scattered villages . The landscape of the southern portion

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is undulating and monotonous with the smoke , the chimney and the stack of coal scattered here and there with intermittent scrubs of vegetation . The existence of underground working of collieries has affected the surface wiht many scars of subsidence . The roads are frightfully busy with heavy vehicular traffic . The railway tracks have fanned out widely and every big colliery is connected by the railways. The din and bustle of the day is, however ,in contrast to the landscape in the night with innumerable electric lights all over and offer a panorama of pleasant sight. Of picturesque scenery the more northern portion furnish but little in the dry months of the year except when the parasnath or Tundi range gives a striking background to the picture . The general absence of big trees in this part of the country ,and the fact that cultivation is almost entirely confined to the rice crop, gives the general appearance of a barren waste in the dry saeson . In the rains the landscape is more pleasant and the fresh green of the young paddy crop shades off into the darker green of grass which sprouts up with the first showers . This contrasts with brown of the ripening crops on the high lands , and of the bare gravel ridges , varied here and there by black masses of exposed rock . These effects are naturally enhanced when the hills gives a background of mingled jungle growth and enormous masses of rock of quaint shapes and varying shades of colour . In the early hot weather the jungle –covered areas , whether on the hills or in the plains , present for a time a brilliant landscape, the red blossom of the palas (Buteafrondosa) contrasting in striking fashion with the fresh green of the new leaves . The district has varying landscapes in different months .

CONFIGURATION .

Before the transfer of the areas of chas and Chandankeary from purulia subdivision of the former Manbhum district the shape of the Dhanbad district resembled an irregular triangle having its vertex on the east and base on the west or resembled an irregular quadrilateral. Its maximum length from west to east was about 44 miles and maximum from north to south about 24 miles. The Grand Trunk Road divides the district into two almost equal northern and southern parts.

But with the addition of chas and Chandankeary thanas from purulia subdivision of Manbhum district(now in West Bengal), the present Dhanbad district has the shape of an irregular polygon . The maximum length from west to east now is about 46 miles and the maximum from north to south is about 47 miles.

HILLS

Dhangi hills run from Pradhankhanta to Gobindpur in this district . They lie between the Grand Chord line of the Eastern Railway and the Grand Trunk Road . The highest peak in these hills is at Dhangi , P.S. Gobindpur and is 1,265 feet high.

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The parasnath hills(4,480 feet) send out spurs , one of which passes through this district via Topchanchi and Tundi . This spur has no noteworthy conspicuous hills but contains two places, viz. Lalki (1,500 feet)and Dholkatta (1,250 feet) from where channels have been constructed for carrying water to Topchanchi reservoir . The Dhangi hills are dry for the most part of the year , but during the rains some grasses grow on them. The spur of the parasnath hills running in Dhanbad district is forested and the non-forested area grows paddy in terraces. The details of the forest produce have been dealt with in the sub-section "Forest" of the chapter.

PLATEAUS AND PLAINS.

The district forms a part of the Chotanagpur plateau. But it is more of an up-land than a plateau. The up-land lies mainly in the northern portion of the district . Strictly speaking there are no large stretches of what may be called as plains in the district . However, the lie of the country in Chas and Chandankeary may be taken as low up-lands where cultivation is practised.

RIVERS.

Following the natural slope of the district all the rivers which intersect or take their rise in it , have an easterly or south-easterly course. They have the usual characteristics of hills streams ; their beds are entirely or almost dry during the greater part of the cold season ,and in the hot season ;they are not navigable during any part of the year with the single exception of the Damodar river, and subject to sudden and violent floods which are usually of very short duration.Except where they run over exposed rock their beds are usually deep in gravel and sand; the banks are abrupt and broken into deep cuts wherever the drainges from the surrounding country finds its way to the level of the stream . Cases of alluvial deposists are very rare, and the only notable instance is the small island thrown up at junction of the Damodar and Barakar rivers. Diluvion on the small scale is on the pther hand constant ; huge masses of gravelly soil are constantly being undermined and detached from the banks, and every heavy fall of rain scours out the small cuts and channels which feed the larger streams . There is no regular system of river –bank cultivation , and as a general rule the banks are covered with low scrub jungle.

THE BARAKAR RIVER.

The northern most river in Dhanbad is the Barakar , which skirts parganas Tundi and Pandra and forms the northern , north-eastern and eastern boundary of the dustrict and runs for about 48miles within this district . Running at first in a south-easterly direction , it suddenly sweeps round the low group of hills to which Durgapur (1,186 feet) gives its name , and runs a few miles south of Chirkunda and Barakar , at the trijunction of Parganas Dumar-Kunda, Chaurasi

from the west its only important tributary, the khudia , which takes its rise in the extreme west of the district between the parasnath and Tundi ranges, and drains the whole country between that range and the high ridge which makes the northern limit of the Jharia coalfield. It means the Damodar river near Chirkunda.

THE DAMODAR RIVER.

The Damodar ,as already stated , formely divided Dhanbad from the Sadar subdivision of the old Manbhum district (now in West Bengal); its course through the district is almost due east. On its entry into the district it receives from the north the waters of the Jamunia river a stream which marks the boundary between Hazaribagh and Dhanbad districts . Of its other affluents from the north the Katri river, which takes its rise in the foot hills below parasnath and cuts through the coalfield area is the most important. Forty-eight miles of this river flows through the district .

It is necessary to give some description of this river. The Damodar rises in Chotanagpur hills about 200 feet above sea-level. Flowing north-east till it meets the Barakar , it runs south-east. After a run of about 563 km(350 miles) in all , the river falls into the Hooghly just above the “James and Mary” sands . The Damodar runs for over 290 km (180 miles) in Bihar before entering West Bengal . Below Raniganj ,the Damodar flows through delatic plains , takes an abrupt turn in the vicinity of Burdwan and flows south . It soon enters the Hooghly district and throws off a number of channels before joining the Hooghly.

The Barakar is the most important tributary of the Damodar .

RAINFALL AND CATCHMENT.

Heavy rainfall over the Damodar Valley is generally caused during the passing of cyclonic depressions following in the north-west direction. The depressions are formed in the Bay of Bengal during the monsoon months , June-October . Sometimes depressions formed over the land mass also cause heavy precipitation.

The average annual rainfall over the upper Damodar basin is 127 cm (50 in.), and the deltaic area receives a sightly more precipitation.

The total catchment of the Damodar is about 22,015 sq.km. (8,500 sq. ml) . The watershed above the confluence of the Barakar and the Damodar is fan-shaped and forms nearly 80 per cent of the tatol area , conducive to heavy concentration of floods . The catchment beyond the confluence is narrow-about 16.1 km (10 miles) wide and 241 km (150 miles) long .

The basin is generally denuded of forest s and vegetation cover.Land management is poor and the soil exposed. Consequently , heavy monsoon precipitation results in severe land erosion. The silt

washed into the river precipitates on the bed. The flood heights progressively increase and spill over the land on either bank.

FLOODS AND EMBANKMENTS.

Raising of embankments was the only flood protection device till very recently . In earlier days bundhs were raised on the Damodar in an ad hoc manner to protect individual interests rather than for general public purposes.A land-owner whose land was threatened by floods would construct a bundh to protect his land from inundation,with the result that the flood water would attack some other point downstream. Thus the process continued till the river banks were protected by a series of regural embankments. Before the last century , however , these were neither so extensive nor so strong as to check the fury of the floods.

The earliest recorded Damodar flood occured in 1770 which cauesd widespread damage to rice crop, resulting in famine. The flood occured on 29th september when the Damodar waters rose to the left embankment crest level near the western extremity of Burdwan town . The embankment gave way. Repairs to the embankment were immediately attened to,but a few days later another flood of greater magnitude destroyed the entire embankment and washed away Burdwan town. Floods of 1787 also did considerable damage to houses and took a heavy toll of human live and cattle . Again in September, 1823 the Damodar played haveoc , this time on embankments.

The floods of 1855 inflicted considerable damageto the right embankment of the Damodar. The Government decided to the abandon the right embankment and extend and reinforce the left embankment to provide copmlete immunity for the country north of the Damodar from the floods .

Floods continued to recur and the more recent ones were in 1913. ..... 35 and 1941. The last two registered a peak discharge of 650,000 cusec at Rhondia.

SHIFTING DAMODAR.

The Damodar in the plains beyond silna has been trying to fan out and from a delta by throwing a number of branch chaanels with its apex near Burdwan .The delta is bounded on the north by the Behula channel. In the plains below silna , the river bank ; but all of them again got lost in the main river a little lower down. In this process the fertile soil of the Rayna Thana has been rendered waste with deposit of coarse sand.

Before the 18th century , the Damodar joined the Hooghly at Nayasarai. Due to several breaches in the right embankment by a series of heavy floods in the eighteenth century the river mouth

moved further and further down the Hooghly . The total movements work out to about 113 km (70 miles) . this continuous change in the course of the lower Damodar to the south was probably accelerated after the removal of the embankment , resulting in the unrestricted spill on the western side. In 1865 a great flood brust through the right bank at Begua and opened out a new channel which runs parallel to main the stream at a distance of about 3.2 km (2 miles) and join the Mundeswari river.

The discharge in the new channels increased gradually at the lost of the mian river. So a cut was made linking the old and the new channels; the cut was named Muchi Hana. As a result of these changes, the Damodar now runs through Muchi Hana and the Mundeswari to join the Rupnarain near Gopigunj. The tail reach of the main river, now called the Amta channel has gradually shrunk and carried hardly five per cent of the flood discharge of the upper Damodar.

Due to frequent changes in the river course, the Damodar has left many stagnant water pools which breed mosquitoes spreading one of the worst kinds of virulent malaria, called the Burdwan fever. It takes a heavy toll of lives every year.

BIRTH OF D.V.C.

The revomal of the right embankment gave only temparary relief . The diastrous 1898 floods forced the authorities to search for detention dam sites in the upper valley. Invsetigation were initiated and reports submitted to the Government but no decision was taken . Neither the 1913 nor the 1935 floods which caused disaster to Burdwan and the East Indian Railway altered the situation . Then followed the 1943 floods which breached the left embankment at Amirpur , overtopped the Grand Trunk Road and damage the railway embankment . This cut off Calcutta from North India during a critical phase of World War II . The Government appreciated the necessity of taming the Damodar at any cost. An Engineer from U.S.A. was brought to India for drawing up a scheme for flood control on the lines suggested by the 1944-45 Damodar Flood Enquiry Committee. An integrated scheme was drawn up, and the Damodar Valley Corporation was set up in 1948 to implement the scheme. The results of the D.V.C. scheme already apparent , will be increasingly evident as the years pass.

D.V.C PROJECT.

The D.V.C. projects were conceived as an integrated whole for the unified development of the Damodar Valley area . The flood that occurred in the Damodar Valley in 1943 , though of a magnitude of 99,110 (3.5 lakh) cusec only, caused extensive damage to private and public property and hampered the war efforts of the Government

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The services of Mr. W.L.Voorduin ,a senior Engineer on the staff of the Tennessee Valley Authority , were secured by Government to study the problems of the Damodar and to make recommendations for its comprehensive development. Mr. Voorduin presented , his report in August , 1945.

The primary consideration in the plan of development as drafted by Mr. Voorduin was flood control though it was deemed desirable that as far as possible the system of dams should be capable of producing the largest quantity of power which should be made available and used to the maximum extent possible and to regulate the flow of water for irrigational purposes.

Mr. Voorduin's scheme envisaged *inter alia* the construction of eight storage reserviors and weir across the Damodar and a network of canals providing perennial irrigation to about 3.1 lakh (7. 6 lakh acres) in the lower Valley in West Bengal.

TWO PHASED SCHEME.

Soon after the Damodar Valley Corporation came into existence , it decided to execute the scheme in two phases ; the first phase covering four dams with connected hydroelectric stations,namely Tilaiya, Konar Maithon and the panchet and ,in addition ,a thermal power station at Bokaro with transmission system and the irrigation barrage at Durgapur , and canal sited . The rest of the four dams, namely , Balpahari , Aiyar , Bokaro and Bermo , were to from the second phase.

Two of these dams Maithon and panchet are located in Dhanbad district.

Besides the above rivers there are other small rivers also in the district . Some of them are as follows:-

The Gobai river- It starts from western and southern corner of the district near village paduadih and meets the Barakar river near Bhojudih . It runs for about 28 miles in Chas and Chandankeary police-stations of the district

The Ijri river- It starts from the middle of the villages Karmagarh and Asanbani and meets the Gobai river near Bhojudih . It runs for about 14 miles from west to east in Chandankeary P.S. of the district.

The Khudia river – It starts from the middle of the villages Parasbani and Asanbani and ends at east and south side of the district near chanch and the Barakar river. It runs for about 29 miles in the district . Khudia river emerges from the confluence of the streams , Panjaria and Jauria coming from the north and west respectively.

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LANKES , TANKS AND RESERVOIRS.

Topchanchi Dam

The construction of this dam was started in October,1915and was completed on 5th November , 1924 at a total cost of Rs.78 lakhs. The dam is 9.000feet long and has a height of 72 feet above the lowest river bed level. The catchment area of the lake is 5 square miles. It has a storage capacity of 1,295.11 million gallons. The water thus stored is used by the Jharia water Board for the supply of water to the coalfield area and the supply is on the gravity supply system and supplies 2.40 million gallons in 24 hours.

The water is supplied after filtration . The type of filtration is slow sand filtration and there are eight filter beds. The total filtering capacity is 2.4 millon gallons in 24 hours.

The water in this reservior mainly comes from Lalki at a distance of eight miles to the north-east and from Dholkatta at a distance of six miles to the north-west.

Special channels have been constructed to bring water from Lalki and Dholkatta in the Parasnath range . Lalki and Dholkatta are in the district of Dhanbad.

this Dam is entirely meant for the supply of water for domestic purposes for the entire Jharia coalfield area including Dhanbad town.

Panchet Dam

The Dam at Panchet hill is the latest and the largest dam of the D.V.C. project. It is built on the river Damodar itself . It is four mile long dam of the earth and concrete running north to south with a vast reservior full of water and a hydel station producing 40,000 K.M of power . It commands a catchment area of 4,234 square miles receiving a rainfall from 45 inches to 64 inches annually. The area of the reservior to the top of the gates ‘ level is 55 square miles . The dead storage water level is 410 feet and the flood regulation level is 435 feet above sae level.The work on the dam commenced in November, 1952 and was completed in july , 1959.

Due to construction of panchet dam 41,461 people were displaced from 19,046 acres of land and 2,119 houses . All the 10,339 families involved have accepted cash compensation for lands and houses.

Maithon Dam

A full description has been given under Maithon in places of Interest.

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Tanks

Besides the above reserviors there are many tanks in this district . The location and the area of the important tanks in this district are given below:-

Name of police-station.	**Name of villages.**	**Area of tank**	**Purpose for mainly used**
		Acres	
1. chas	chapa tank	30.88	Fishery
2. Do	Bahudih	22.24	Ditto.
3. Do	Bharra	20.27	Ditto.
4. Chandankeary . .	Lalpur	30.63	Ditto.
5. Nirsa . .	Asanlia	20.20	Fishery and Irrigation.
6. Gobinpur . .	Rislay bandh near Govinpur	50.00	Ditto.
7. Dhanbad . .	Baker Bandh, Dhanbad	40.00	Fishery.
8. Nirsa . .	Pandra	40.00	Fishery and Irrigation.

Springs and other Water Resources.

There are quite a few small springs scattered in the rural areas which from sources of water-supply to the villages . They are commonly knownas Darhis . some of them are perennial and if the water discharge is sufficient ,villages put small earthen dams for storing water for irrigating their lands.

Regarding underground water resources, there has not been any scienticfic survey. Certain features regarding the ground water conditions may , however , be inferred from the nature of the rock formations. The Archaean crystallians constituting the central and southern portions of the district are generally impermeable excepting within the zone of weathering . Ground-water is confined in these rocks to open joints, zones of shear and such other planes weakness . The Archaean country is generally unsuitable for putting down tube- wells . Where large supplies of water are required it would be advisable to construct either large tanks and impound water by constructing dams and barrages across suitable streams .

The Gondwana sediments occur in basins which should have given rise to favourable artisan conditions but for the highly compacted nature of these sediments .Even sandstones in these basins are not generally known to be very good aquifers due to their being felspathic . The numerous sands and seams of clay also reduce the water-yielding capacity of these sedimentaries. The actual

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ground water conditions in the coalfields can be assessed only after a detailed systematic survey. The chief sources of the water-supply in the coalfield are the Ragdaha reservoir at Topchanchi which supplies drinking water to Jharia and surrounding areas, the Damodar river and the working sand abandoned coal mines where much water is known to collect. It is , however ,believed that there are underground water resources of the district which cannot be said to be adequate . The enormous expansion of the industrial zones and the mining areas has created quite a problem and sooner or later the Topchanchi dam and the reservoirs will have to be supplemented .There is an acute water scarcity in the district during the summer months and many of the villages do suffer for want of adequate water. Even water scarcity is felt in Dhanbad town . The few tanks and water reservoirs at Maithon and elsewhere are hardly adequate foe a perennial supply of fish to Dhanbad and the other towns . There is a constant demand for fish the price of which has considerably gone up throughout the district . Some of the tanks are not being properly utilised for fishery . Excavation of tanks has completely stooped . Previously tanks used to be excavated by local Zamindars on ceremonial occasions or as a mark of charity.

The want of water resources also affects cultivation. The terrace cultivation is a common feature and the up-lands hardly get sufficient water . The lower regions are more fertile because they get more of the rain water . Irrigation through channels is almost completely unknown excepting where in the areas which get water from the dams. The want of sufficient water also affects the lands of Dhanbad and other towns.There are hardly any green vegetable belts which should have been the usual feature of expanding urban areas.

THE GEOLOGICAL FORMATIONS AND THE ECONOMIC MINERALS OF DHANBAD

The Dhanbad district occupies an area of 1,114 square miles .

from a geological point of view Dhanbad district can be divided into northern half which consists entirely of ancient crystalline rocks , and the southern half which is occupied by the great coal basin of Jharia in the west and the cis-Barakar portion of the Raniganj coal basin in the east ,with intervening area of crystalline rocks .

TOPOGRAPHY

The Topography of the southern half of the area is undulating and rather dull with very few conspicuous features. The northern portion is , however, characterized by greater variation in relief.

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Apart from the several low ridges which occur north of the Grand Chord Rly,line between Pradhankhanta and Gomoh stations, the highest peak of parasnath (4,480 ft.above sea-level)send out its spurs up to north-western corner of the district where the famous Topchanchi dam is built to supply drinking water to the Jharia coal field . The more or less continuous ridges of the parasnath range run for a long distance eastwards from this place and from the northern hilly portion of the district . These ridges vary in altitude from 1,200 to above sea-level.

The general slope of the country is towards south and south-east , so that most of the tributaries of the Damodar river flow in these directions. The Damodar river is itself flowing from west to east, along the southern boundary of the district, but its course has been determined more or less by the great boundary fault of the Jharia coalfield.

The main tributaries of the Damodar river , which flow in from north are the Jamunia river which marks the north-western boundary of Dhanbad district , and the Barakar river which marks the eastern boundary . Other tributaries which flow from the north are, beginning from west, Katri river near Katras with its western tributary Khudia , chinadi south of Dhangi ridge, east of Dhanbad , and the main Khudia river flowing south-east-wards , north of Govindpur , with its tributary Pusal. Due to the Prolonged denudation to which this region has been subjected , there is not much correspondence between the structural features and the directions of drainage in case of rivers other than the Damodar.

Most of the hills and ridges of the area owe their preservation due to the greater hardness of the rocks which constitute them compared to that of the surrounding rocks. The common types of rocks which give rise to outstanding hills are the metamorphic rocks like epidiorites , amphibolites , metadolerites and metanorites . some of these hills may thus be regarded as igneous in region . A few ridges are composed of quartzites, granulites and micaceous schists and gneisses, and they may be regarded as relict type of ridges which have suffered less erosion than the surrounding area. The veins of white quartz (often brecciated) which are so common in the metamorphic terrain of the district also form low ridges due to their resistance to denudation.These ridges may , however , be regarded as tectonicin origin as they usually indicate fault zones.

Inside the coal basins, the sandstones form long low ridges with characteristic scrap and dip slopes, and the accompanying shales and coal seams form depressions running more or less along the strike direction . The so-called “burnt” outcrops of coal steams and dolerite dykes also form small mounds and ridges.

Climate

The climate of Dhanbad district is very pleasant especially in the cold weather months-November to February-during which the

temperature (according to the last three years records of the Hydrometeorological Observator at I.S.M. and A.G. , Dhanbad) varies from lowest minimum of 47° M to the highest maximum of 94°F. After February the climate becomes warmer and warmer until the rains break in the middle of June. The temperature during these four months March to June varies from the lowest minimum of 56°F to the highest maximum of 114° F. During the remaining months, July to October, which include the rainy season, the temperature range is from the lowest minimum 59°F to 97°F. The average annual rainfall of the area is 55"most of which is precipitated during the rainy season – middle of June to middle of October . The rainfall around parasnath hills is reported to be more than the average . In 1953, we had more than 69" of rainfall at Dhanbad till the end of September , the maximum downpour of rain in 24 hours being 6.48" on 3rd July , 1953.

Ancient Crystalline Rocks.

The oldest geological formations of the Dhanbad district are composed of crystalline metamorphic rocks which belong to the Dharwar system (Archeans) in Indian stratigraphy . In these formations are found rock types of both sedimentary and igneous origin. The sedimentary rocks were originally deposited as sandy , clayey and calcareous sediments , more or less impure . These sediments were consolidated as sandstones, shales and limestones of different composition and then were subjected to regional metamorphism and converted into quartzites (granulatic and schistose varieties), micaceous schists, crystalline , limestones , calc-silicate granulities and calc-gneisses and in some cases to amphobolites and hornblendeschists. The last two rock types may in part, be contemporaneous lava flows or sills subsequently metamorphosed . All this happened in the 'Dharwar' period, more than 900 years ago.

The above metamorphosed sedimentary rocks were then intruded by magmas of both basic and acid composition, possibly in the earlier post-Dharwar times . The basic magma was of doleritic and noritic composition and is now represented by intrusive dykes and masses of metadolerites , metanorites and some of the epidiorites . These rock types usually occur as prominent hillocks in the area. The acid magma which intruded later than the basic magma had given rise to the granite pegmatites, aplites and some quartz veins of the area.

In the later post-Dharwar times, the metamorphosed sedimentary rocks and the igneous intrusives were subjected to the metamorphism due to which the rock types were permeated , soaked , felspathised, homogenised and granitised into streakly , augen and injection gneisses . Some of the gneisses and epidiorites of the area show typical rapikivi structure (ovoids of potash felspar surrounded by rims sodalime feldspar.)

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Not much work has been done on the crystalline metamorphic rocks of Dharwar age of this area since the time of Bill (Mem. Geol.Surv. India ,1881, Vol. 18, pt.2) who surveyed geologically Manbhum and Singhbhum areas of Bihar . During recent years , the students and staff of the Geology Department of the Indian School of Mines and Applied Geology have carried out some geological mapping of the metamorphic area bordering the Jharia coal basin and a tentative classification of the Dharwar and post-Dharwar rock types of this area is show in the following table no.I

TABLE N0.I

The Ancient crystalline Rocks of the Dhanbad district.

Later post-Dharwar Injection comple	Streakly ,injection, augen and sillimani to gneisses.
	Rapikivi –bearing gneisses and epidiorites.
	Granites, pegmitites, aplites and some quartz veins.
Earlier post-Dharwar Intrusives	Metadolerites and metanorites with or without olivine.
Dharwar	Gneisses, amphibolites, epidiorites and hornblende-schists.
	Quartzites, (granulitic and schistose) granulites, and calc-gneisses.
	Micaceous Schists.

Rocks of coal-basins

The above ancient rock types form the basement rocks of the Dhanbad district and it was over these rocks that the Lower Gondwana group of sedimentary strata including the coal bearing beds were laid down . These sediments are river deposits and were deposited in slowly sinking faulted troughs (basins)in the more or less then flat country composed of Dharwar rocks, so that it was possibly for the accumulationof the several thousands of feet of river and stream deposits in definite linear tracts like the Jharia and the Raniganj coal-basins. At the commencement of the Lower Gondwana period (some 300 million years ago), there was a Glacial Age in Indian as is evident from the glaciated boulders deposited at the bottom of the Gondwana system of rocks and the presence of undecomposed feldspar grains in the associated sandstones above them . The climate rapidly became much warmer and gave rise to the super-abundant growth of vegetation which supplied the materials for the formation of coal seams in the succeeding series of rocks in the Jharia coalfield and in the Cis-Barakar portion of the Raniganj coalfields.

GENERAL

The sedimentary rocks of the Gondwana coalfields have been classified mainly on the basis of their lithological characteristics and the nature of plant fossils found in them .Table no. 2 shows the stratigraphical formations of the Jharia coalfield.

TABLE N0. 2.

The Geological formation of the Jharia Coalfield.

Superficial deposits		**Recent**	**soil and alluvium of rivers and streams.**
Igneous intrusives	. .	**Cretaceo-Eocene Lower Jurassic**	**Dykes of basic igneous rock, dolerite sills and dykes of ultrabasic igneous rocks mica- peridotites and lam-prophyres**
Lower Gondwana system	**Upper per. main.**	**Raniganj series (up-per coal measures 1,840´thick)**	**Brown medium- grained sand stones; bands of sideritic sandstone weathering yellow; carbonaceous and micaceous shales;fire-clays and 9 coal seams.**
	Middle per-main	**Barren measures (2,000´thick).**	**Laminated and massive sand-stones;shales with nodules of ironstone (clayey siderite) or limonite at some places.**
	Lower main	**Barakar series(lower coal measures 2,000´thick).**	**White coarse- grained micaceous sand-stones; ferruginous sand-stones; arbonaceous and mica-ceous shales; fire-clays and about 25 coal seams.**
	Upper carbo-niferous	**Talchir series (400´-800´)**	**Boulder bed; green fine- grained sandstones; green shales showing nodular and needle shaped weathering**

Great unconformity.

Dharwar and post-Dharwar crystalline *rocks (as listed in Table n0.1)*

The Cis-Barakar portion of the Raniganj coal-basin has also got similar stratigraphical succession as the Jharia coalfield except that the Ranigsnj series of rocks do not occur in that part and the dykes of dolerite have not been found there.

Dykes and sills of Coal-basins.

The sedimentary rocks of the Jharia and Raniganj coal-fields were intruded by a series of dykes and sills of ultra basic igneous rocks,possibly in Lower Jurassic times. These rocks have been termed as mica-peridotites (and as ‘ ‘mica traps’ , a convenient mining term) . Recent petrological studies have revealed that many of these rocks are lamprophyres amongst which mica-lamprophyres and leucite-lamprophyres are the common types.Olvine (usually as

pseudomorphs), biotite (as reddish-brown flakes)and apatite (as needles) are the common mineral constitutes observed embeddedin the highly altered matrix consisting of secondary minerals, like serpentine ,chlorite calcite,kaolin ,limonite etc. some of the micaprriotites are exceptionally rich in apatite (phosphate of lime) which may form 11 per cent of the rock.

Fresh specimens of lamprophyres are rare to find except underground in the coal mines. Usually the rock is weathered into a soft and porous, brownish-red,purple or yellowish rock. In some cases, iron has been leached and the rock is weathered to a vesicular white or grey coloured rock.The intrusions of lamprophyres occur more commonly as sills running parallel to the bedding planes of the sedimentary starata rather than as dykes cutting across them. The intrusions of are usually more widespread in the coal seams, especially of the Barakar series , where they usually occur as lens- like masses, thin flat sheets or anastomising vein-like sills, at the junction of the coal seams and the underlying sandstones or in the coal seams themselves. They have been called as the ‘pest’ of the coal seams as they have partially caked the coal of the seams ,for short distance on either side of the sills into a hard dense materials , locally called ‘ natural coke’ , ‘ burnt ’ , ‘coal’, or ‘jharia’, which shows characteristic columnar structure but is worthless as a fuel.

The other intrusions are the dykes of basic igneous rock dolerite. These intrusions are more regular than those of micaperidotites and lamprophyres, and unlike the later, they never occur as sills and have not done much harm to the coal seams which they ut across. The dolerites are massive medium grained rocks showing black to dark-grey colour on fresh surface. They show prominent rectangular jointing and spherodal or onion-like weathering . These rocks are composedof minute white or grey laths of lime-soda feldspar (labradorite), black grains of phyroxenes (pigeonite and augite)and glass (mostly devitrified) . The dolerite dykes are later in age than the lamprophyres and mica-peridotites and are as the DeccanTraps,i.e. Upper Cretaceous to Lower Eocene.

Structure of Coal-basins.

The Lower Gondwana sedimentary rocks of the coal-basins lie unconformably over the older crystalline rocks of Dharwar and shaped . The Lower Gondwana strata with their associated coal seams therefore dip inwards from their outcrops towards the centre of the basin. Though the Cis-Barakar portion of the Raniganj coal-field is only a part of the main basin , there are a few local small basins in Barakar coal measures ,like that of Shampur seams . These basins owe their synclinal origin partly to the swinging round of the strata in the vicinity of the great boundary fault which runs along the southern border of the basin.

GENERAL.

The main axis of the synclinal Jharia coal-field basin runs W.N.W.E.S.E.and is pitching gently towards west, as can be seen by the dips of the Raniganj strata along the Jamunia stream. This line of axis is neither straight nor curved in a simple manner but it is itself corrugated due to the forces probably coming from east to west.

Recent Formations.

The recent formations which from superficial deposites are the alluvial sands of rivers and streams and the residual soils derived from the weathering of bed rocks . Thick deposits of recent alluvial sand occur adjacent to the banks of the Damodar and Barakar rivers and and Jumunia, Khudia and Pusal streams . The Damodar sand is being used at places for stowing the goaf areas in the important coal mines of the Jharia coalfield. In addition to recent alluvium, there are patches of older alluvium on the banks of the Damodar and Barakar rivers , lying either well above the present high flood level of the rivers or in channels now more or less abandoned due to the shifting of the river course.

The nature of the soil depends upon the chemical composition of the bed rock from which it is formed, the climate of the region and the topography of the place. Coarse gritty soil admixed with big fragments of rocks is formed from the weathering of pegmatites, quartz veins and conglomeratic sandstones,whereas sandy soil is charactereristic of granitic rocks and sandstones . The basic igneous or metamorphic rocks ferruginous sandstones give rise to the reddish brown ferruginous soil, sometimes lateritic .The crystalline limestones and calc-silicate granulites give calcareous soils.Both the above types of rocks are also responsible for the formation of small nodules of 'Kankar' (calcium carbonate) in the soil . The fine grained shales give loamy soil and carbonaceous shales and coal seams, dark-brown to black soil. The amount of 'humus' (dark-brown decayed vegetable matter) present in soils is responsible for the dark-brownish colour of many of the paddy field soils. At some places, white efflorescence of '*reh*' (maximum of sodium sulphate, sodium carbonate, etc.), is also found as thin encrustation on the surface. It is deposited by the evaporation of alkali salts by the percolating water which is brought up from below by capillary action during the dry season.

Economic Minerals.

Though hardly a dozen minerals of economic importance occur in the Dhanbad district it is one of the premier districts of India so far as the most important fuel minerals coal is concerned. The Jharia coalfield is our storehouse of good quality coal, the reserves of which are estimated (up to a depth of 2,000´) to be more than 1,000 million tons, about 75per cent of it being good quality coking coal. This field is responsible for about 40 per cent of the total coal annually produced in India . In addition to this coalfield, the

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Cis-Barakar portion of the Raniganj coalfield lying in this district ,also produces appreciable amount of coal. Separate statistics for the part of the Raniganj ccalfield are, however, not available but the Raniganj coalfield as a whole supplies about 30 per cent of the total annual output of Indian coal. Next to coal in this area are the deposits of fire-clay associated with the coal measures . Other economic minerals are builinding stones, road metal and railway ballast ,silica (quartz and sand) , 'kankar', mica, steatite (soapstone),china clay, graphite, iron ore and afew mineral springs.

Coal.

Coal seams occur in the Jharia coalfield in two series of strata-Barakar series or the Lower coal measures and the Raniganj series or the upper coal measures. In the Cis-Barakar portion of the Raniganj coalfield, the coal seams are all of the Barakar series. The Barakar series coal are generally coking and they contain a relatively higher proportion of fixed carbon and low percentage of volatiles and moisture than the Raniganj series coals.The better quality coals of the Barakar measures are excellent steam coal and form hard metallurgical coke. The Raniganj series coals are volatile, long flame non-caking or poorly caking gas coals.

There are more than 25 coal seams of over 4 feet thickness in the Barakar series of the Jharia coalfield. The better quality Jharia coalfield seams range in thickness from 30 ft. downwards. The coal seams in the Barakar series of the Jharia coalfield have been numbered as I to XVIII, the first seam being the bottom-most and hence the oldest seam, and the eighteenth seam, the youngest of the seams. Any new seam since discovered is donoted by assigning a suffix like A. B. etc. or " special" to the number of the seam next below it. These seams have been divided by Dr. Fox (Mem.Geol.Surv. India; 1930,vol.56), into the following four stages, based on the predominating types of strata and the quality of particular seams found in them (Table no.3)

Table no.3

Coal seams of the Barakar Measures of Jharia coalfield.

Jorapokar- Bhagaband-phularitand stage, containing seams nos.XVI to XVIII which are mainly of superior quality coking coals.

Jealgora –Barari-Bhauri stage, containing seams nos. XIII to XV which are also of superior quality coking coals.

Nadkharki-Gareria- Tisra stage, containing seams nos. VIII to XII of which the last seam is of good quality and others of moderate quality coking coals .

Matigara-Muraidih-Golakhdih stage, containing coal seams nos. I to VII which are mainly of inferior quality coal.

GENERAL.

The coal seams of Raniganj series are of much less importance than those of the barakar series. In the Lower portion of the series the Bamangora-Murlidih stage of the coal measures, there are seven seams of which three are workable with an average total of 15 ft. of coal, whereas in the upper portions of the series- the Telmucha-Pathargaria stage, there are three seams of the which topmost (7ft.) is workable.

In the Cis-Barakar portion of the Raniganj coalfields, the coal seams are all of the Barakar series . The seams of this field are not properly correlated and numbered as those of the Jharia coalfield, but are not denoted by the names of the important localities where they are worked .Seven main coal horizons are recognized by Dr.Gee(Mem.Geol.Surv.India,1932,Vol.61;andRec.Geol.surv.India,1945,Vol.76.Bulleti n-16) in the Barakar coal measures of the Raniganj coalfield. These horizons are shown below in Table no.4

Table no.4

Coal seams of the Barakar Measures of Cis-Barakar Raniganj Coalfield.

A coal seam (3 to 4 ft. thick).

Shampur no.1 seam and Chanch-Dumarkanda seam.

Shampur no. 2, 3 and 4 seams and Kharbari seam.

Shampur no. 5 and 6 seams, Chatabar seams and Patlabari –Laikdih seam .

Rangamati-Nirsa-Gopinathpur seams,

Kanauri-Birsinghpur, Bindrabanpur-Siulibari and Kapsara-Kalimati seams.

Pusal-Merthadih seams**.**

Fire-clay.

Fire-clay suitable for the manufacture of fire-bricks occurs as layers or thin beds in the coal-bearing sedimentary formations – the Barakar and the Raniganj series of the Jharia coalfield and the Barakar series of the Cis-Barakar Raniganj coalfield. shri D.R.S. Metha of the Geological Survey of India has recently carried out a survey of the fire-clay deposits of these coalfields . According to his reports (minerals Resources of Damodar valley by shri V.R. khedkar, 1950, D.V.C. Publication) good fire-clay occurs in the Barakar coal measures of the Jharia coalfield in the several localities which can be included in the following five areas , the approximate total reserves up to a depth of 20´ being about 5.3 million tons:-

Nadkharki-Bhaldih area

Sonardih-Tetulmari area

East Kenduadih-Kusunda area.

Tirsa- Suranga area

Pathardih – Chasnala area.

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In the Cis-Barakar Raniganj coalfield, good Fire-clay occurs it Nirsachatti and Mugma –kumardhubi areas,which have a total reserve of about 1.8million tons up to epthol 20.

Building Stones.

Amongst the rocks used for building purposes in this area, the massive sandstones of the Barakar measures of the Jharia coalfield, and the Cis-Barakar Raniganj coalfield, Provide very good building material and they have been used in the constucation of bridges (including the Grand Trunk Road bridge over the Barakar river), culverts and building and alos in the construction of shaft-linigs and machinery-foundations ni the coalfields. Barakar sandstones have been used in the famous Topchanchi dam and also in the old temples near Barakar town. they are also reported to have been used in a portion of the Calcutta High Court. These sandstones are also quarried as mill-stones.

Others rocks which are used for building purpose are the hard sandstones of Talchir and Raniganj saries, and the quartzites, streaky gneisses, hornblende-schists and other metamorphic rocks of the Dharwar system which may be easily worked.

Road Metal and Railway Ballast.

The rocks whivh are being used for this purpose are the metadolerites, epidiorites, hornblende gneisses, quartzites, granulites and fine grained streaky gneisses, of the Dharwar System, the dolerites of the dykes found in the coalfield and the quartz of the quartz reefs which traverse thye metamorphic areas of the district. The hardest rocks of the area are the metadolerites which together with the epidiorites and some amphibolites, have been used after crushing as cement concrete aggregates at the Sindri Fertilizer Factory. the calc-silicate granulites and actinokitic gneisses have been used after breaking into fragments as rock aggregates for road concrete in Dhanbad area. Vein quartz is extensively quarried for road metal and ballast.

Silica (Quartz and Sand)

Silica in the form of vein quartz is found in abundance in the areas occupied by crystalline rocks. The veins or reefs of this quartz are unexpectedly quite bareen, i.e., devoid of any trace of metalliferous minerals . Many of these veins are regarded to be much traversing the area. Some of these quartz veins are definitely formed by deposition from descending (meteoric) waters. These veins show crustified banding, composed of aggrates of quartz showing different banding degrees of crystallization and habit; and though this quartz is often superficially stained with red ferruginous matter, the veins can easily yield of sufficient purity to be used for glass manufacture. Only an economical process this quartz without admixing it with iron matter the mill during the

process, is to be evolved Some of the large quartz reefs like those near Pardhankhanta Railway satation and near Dhanbad town are likely to give appreciable tonnage of the material.

In addition to the vein quartz, Some of the white Barakar sandstones and Dharwar quartzites can also yield white glass- sand after crushing, sieving and washing. They can also be used in the manufacture of refractory silica-bricks.

The sands of the Damodar, Barakar, Jamunia and other rivers are used in mortar and concrete. These rivers can easily supply the quantity of sand required for stowing purpose in the underground coal mines area. With the constructon to the various dams of the will, Damodar Valley, a large proportion of sand will, however, be deposited in the reservorirs, and with the reclamation of the waste lands and control of soil erosion the sand in the bed of the Damodar river will in future not be fully replenished annually and thus will become a limited asset.

'Kankar'

Small deposites of kankar (calcium carbonate) accur on the bank of Barakar river and east of Dumarkanda. in addition, as result of weathering of(i) the sideritic sandstones of the Raniganj series (ii) the mica-peridotites and lamprophyres of the sills, and (iii) the cale-gneisses, calc-silicate granulites and amphibokites of the metamorphic areas, small irregularly-shaped nodular fragments of Kankar are disseminated over the surface of soil overlying thets rocks . Some of these deposits have been used for lime burning**.**

Mica.

The older view that the mica belt of bihar is 60 miles long and 12 miles wide, extending from Gaya district from the west across the Hazaribagh and Monghyr district into Bhagalpur district on the east, needs revision in view of the fact mica has been obtained recently from other arrears in Bihar outside this belt . In the Dhanbad district, it has been worked at several localities (Dunn, Mem, Geol Surv.India, 1942, Vol. 78, p. 183). The important areas in this district where mica accours lie east of Baliapur, north-east and sourth-east of Chandankeary and north of Jharida Railway Station, with in10 miles distance in each case.

Steatite Soapstone

Steatite is a massive compact variety of mineral talc, and soap-stone is an impure form of Steatite , used since ancient times, as potstone . purer variety of soamstone is used as a refractory material and polishing agent . Steatite has been found in the Pendra Kismat estate(23° 48′ : 86° 43′) and has been used for the manufacture of bricks in the alkali furnaces of Paper mills.

Iron ore

The ironstone shale series, now termed as Barren Measures, contains at places lenticles and nodules of iron-stone (clayey siderite,

iron carbonate) often altered near the surface to hematite (iron oxside) and limonite (iron hydroxide) . The bands of iron-stone at however, very irregular in habit. They occur both in the Jharia coalfield and in the Raniganj coalfield But are more abundant the latter field . The site of the Kulti Iron Works near Barakar with origionally chosen on account of the proximity of both coal and the deposits of these ironstone nodules which accur in abundance in the iton-stone of shales running east and west of the Works. for man years the iron-stone , from these beds were the only supply of on but the discovery of exceptionally rich iron-ore (hematite) of sing bhum has made these deposits now uneconomical to work.

In addition to the iron-stones of barren measures, feruginou lenticles and bands are also found in the Barakar and Raniganj series and these had been from worked in the distant past by the local smelters as is eveident from the heaps of iron-stone found here and there near the outcrops of these bands.

some of the steams which flow over amphibolitic rocks of the area contain lot of black stand in their beds which is rich in manger tite(,magnetic iron oxide) but at present it is not of any importance.

China Clay

This ceramic clay has been found at Mahatamarra (23° 25′ : 85° 55’) north-west of Jhalda Railway station.

Graphite.

It has been found north of Jaipur Railway station (Puulia, Ranchi line). the mineral is used in pencials in refractory crucibles as lubricant and also in electrical industry.

Mineral Springs

There are a few mineral spring in the area and many of these accur along the planes abd are situated in the metamorphic rocks near the Damodar river along the faulted boundary of the coalfields. The important spring near the westem border of the Raniganj coalfield are Jherbari (23° 42′ : 86° 46’) Tathi (23° 41’′ : 86° 48’) and Tantloi (23° 41′ : 36° 44’). the last one is situated on the south bank of the Damodar river and is said to have a temperature of 190° F (88° C).

There is anther hot spring on the north bank of the Damodar river about $5\frac{1}{2}$ miles east by north of the easter termination of the Jharia coalfield at Sheopur (23° 40 : 86° 36’).

Far away from the Damodar river and near the northern boundary of the district is another hot spring at Charakh (23° 1’′ : 86° 25’). Most of these are suphurous and are said to have medicinal values.

Conclusion.

Most of our knowledge of the geological formations and the economic minerals of the Dhanbad district is confined to the easily.

accessible portion of the area in and at the outskirts of ht ecoalfields. In course of time as the comparatively inaccessible hilly tracts, north of the Grand Trunk Road in this district, are geologically surveyed, there may be more information available about the deposits of some other minerals like China clay (Kaoin) known to occur near Tundi, and Garnet, a common mineral in the metamorphic rocks of the Parasnath hills.

VEGETATION.

Vegetation of this district is profound internet, consisting of a number of closely related process, so important that each form a special field of study. Attention has been particularly paid to those ranges of the district, which are rich in different types of vegetation . only those types of species have been covered which are important form economic, industrial and medicinal point of view. the vegetation are passing under a tremendous change due to burning and grazing, denudation ruthless exlotation of forests, human invasion and industrialization, etc.

Species observed two or three decades back have reached at the point of extinction and are survining with a few scattered representatives. In village, specially in rocky plains Yucca had been dominating some years back but is almost extinct.

The vegetation of the district has been studied by dividing the district in three zones—

(i) Zones-covering forests.

(ii) Zone-covering hills and rocks fields.

(iii) Zone –plains Iditches, old disused coal mines, etc.)

Description of the characterstic trees.

Trees of commercial importance for their timber.

Sal –(Shora-robusta)- It is the dominant species of the forests of this area. Tall and robust the tree offers a very good timber. The bark of the tree is used for fuel purposes. Besides forests the tree is commonly seen on both sides of the roads and on hills. there seems to be two forms of this tree the most prevalent having a dark-brown heart-wood while that of the other is white, slightly reddish.

Sisoo (Shisham)(Dalbergia) . – A large tree yielding good timber. The species are not common. They are mostly found on road side and on the hills.

Murga (Ptercarpus) – marsupium- A large deciduous tree with a brownish heart-wood, used for making furniture. The plant is found only in jungles of Tundi, Topchanchi, etc.

Siris (albizzia-procera)- This is one of the chief associates of the sal forests. The leaves are compound. Flowers are small in size. The wood is used for making wooden boxes.

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Bostal (D- latifolia)- Deciducous trees yielding good timber. but the tree is not so common.

(Pongamia glabra)- Only one type of this species is founds in wild stste. It yields a low quality of wood. the yield oil, used as medicine by the villagers.

palas-(Butea-frondosa)- The plant is found in the form of medium size trees, and fairly common in the district, the hilly area, forests and plains are over populated by this plant. The standard of its size and its population ara retrogressing rapidly due to human habitation and invasion. the characteristric of this plants is its brilliant orange, red flowers. In the summer months the palas trees offer a blaze of red flowers. the wood is utilised mainly for fuel purposes.

Mahua (Bassia- latifolia)- The plant is found in gigantic form and size . It has a very hardwood with reddish touch. The timber is used for many purposes. The plant is one of the common associates of the forests and universally accurring in this hills and plains. it is seen thet in village area this is the only type of tree which is nit being ruthlessly spoiled due to its ample economic importance.

The flowers are an important source of food. The mahua flower is cooked and eaten by the poorer classes. The mahua in dry satate is one of the folders for animals. the fruit yields an oil which is used for culinary purpose, for lamps and in adulterating ghee. A decoction of mahua gives an intoxicating drink commonly taken by the adibasis and others.

Kend (diosphros-melanoxylon).- is a small medium sized tree common in hilly area. The fruit is palatable in ripe state.

Gamhar (gamelina-arborea). The timber is uded in making furniture.it is fairly common in Govindpur area.

Plants yielding edible fruits, years, fibre, etc.

Maluaceae- The family is important as consisting of a number of fibre-yielding plants.

Bombax-Malabaricum (Shimal).- It has a gigantic size. The flowers are showy and red in color. The seed yield fine silk cotton which is marketed by the name of Kopok fibre. Kydia Calycina is a large shrub from the bark of which fibre is obtained. Other wild Malvaceae which yield fibre are mostly shrubs, but they are not common.

Certain plants of the family Sterculiaceae are fibre yielding, as foetids. The plant is not common in wilkd state, but a few of them are seen planted on road side. Fibre is also obtained from Crotolaria (San) which is never founds in wild state.

GENERAL.

Natural dye stuff abd stains, obtained from the roots, bark leaves and flowers have been obtained from the earliest times. They plyed earlier an important part in the social life of the people. The plants of such value are very few and always in scattered condition, except those of palas which are one of the dominating representative in forests plains, hills and even in road side. The flowers of butea-frondosa (palas) are used in extracting dyes, specially in spring season, when the tree appears deep red due to its red flowers.

Lawsonia-alba (Mihendi) – A shrub never found in a wild state and makes a good hedge. the leaves yield hena dye which is used to colour the skin and hair. Commonly used to stain finger nails.

Wood fordia-floribunda (Dhatki)-Rarely seen in some part of Topchanchi forests. it has long arching branchas which shred off reddish brownbark in fibres. The leaves and flowers are extensively employed in tanning and dyeing. Morinda-tinctoria (chaili) is a moderate sized deciduous tree, seldom if ever found in a purly wild state. This at one time was a most important tress as the bark of the root was extensively used to dye yellow and red. Other species of Oldenlandia.

Curcuma longa (turmeric) cultivated as one of the important colouring material of india. The natural dye is orange red.

Oroxyum-indicum (Sonae)-A small tree remarkable for its long flat sword like capsule and large flowers. The bark and fruit are used in tanning and dyeing. Cetain red wood dyes are also produced from the heart-wood of caesa pinia.

Mango- (Mangifera indica) –The tree which is in wild state, yields rather inferior quality of fruits-dwarf in size. Those which are cultivated yield superior quality of fruit. It is largely planted as groves near village and on road sides.

Pial-(Buchanaria latifolia)- It is a middle sized tree, generally found in wild state. The fruit, on ripening, are edible.

Bhelwa –(Semecarpus anacardium)-The plant found only in wild state. It is one of the common associates of the forests of this area. Its fruit is generally one inch in length, the pericarp is full of an acrid juice, which takes the place of marking ink, the hypocarp when ripe is of a bright orange colour and is edible.

Sajina (Moringa-pterygosperma)- Generally cultivated for its great food value. the tree is medium size. Stem is soft and tender.

leaves, flowers and fruits are eaten. leaves boiled and are supposed to control hyper-tension.

Imli (Tamarindus-indica)-found both in cultivated and wild state. The tree is of gigantic height and grows on the plains and

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hills. The fruit are legume and edible, both in rip and are eaten in period scarcity.

Amaltas (Cassia-fistula) Mostly tree or shrubs, flowers large pendulous racemee of a bright yellow apperrance…… cylindrical.

Jamun (Eugenia-jambolanda)-Occurs both in wild and cultivated state. The plants occurring in forests, yield low quality fruits, but those which are cultivated yield superior quality Commonly seen on boyh the sides of roads. The pulp of the is said to have effect on diabetes. The juice of the fruits digestive.

Kadam (Anthocephalus cadamba)- A large deciduous tree rapaid growth. The fruit is eaten and the flowers are offerect worship. the plants are exclusively in wild state and general the forests.

Kend (Daiosphyros-melanoxylon) –The fruit when ripe is palatable. It is a common food of the Santhals.

Kathal (Artocarpus integrifolia)- It is a large ever-green and extensively planted for its fruit which is of high value. fruit comes out generally after spring. It supplements the food becomes the only source of food for the poorer classes if in district.

Dumbar (Ficus-curia0_Usually in wild state and prized for fruit which are edible.

Dahua (A lakoocha)-Only in wild state commonly foud hill and forest. Fruit when ripe, become yellow and edible.

Aura (Phyllanthus-emblica)- A small tree. Generally in state but a few of then are also seen in the villages. The fruit edible and also pickled.

Medicinal plants.

The pharmacology of the plants has not been studied but use for medicinal purposes is quite common. The pulp of the fruit of Amaltas is used as purgative.The bark of the Ashok-tree (family leguminosae) is used teating the wounds of animals. The flowers of Makehan (……..permum-acerifolium)-are used as a disinfectant.

Rohan(Soymida-Febrifuga, family meliacae)-the heart……. of the tree is brown. The powder of the treatment of pain of the and muscle-strain.

The medicinal plant are mostly herbs shrubs which ……. **Ipomaea-aquatica**—a twining herb, common in ponds in exclusivelt wild state.

ditches. Flowers pale rose-coloured, funnel-shaped, medicinal, juice used as a purgative.

GENERAL.

Ipomoca purga –The tubercles are used as a purgative.

Datura alba (Dhatura, family, Solaneae)- Poisonous herb, strong smelling common in garens and wate ground. The seeds are poisonous which yield a drug called stamonium.

Nicotiontabacum (Tobacco) –Generally cultivated. The alkaloid nicotine has medicinal and insecticidal properties.

Withania somnifera (Asgand)- a well branched herd, common in waste ground. The various parts of the plants are used for medicinal purposes.

Adhatoda vasica (Basaka)- family Aanthaceaa- wild in submountaneous regions. leaves barks, etc. are used for various medicinal purposes**.**

Salvia – Wild herb. has some medicinal properties. Generally the plants of family labiatoe are cultivated for their medicinal value. pedlium (Mota gokhru- family Pedalia ceae)- wild. The decoction of pedalium fruits is used for urinary complaints, spermatorrhoea and impotency. The infusion os leaves and stem are also used for veneral diseases. The huice of fruit is also medicinal and prescribed in purpurreal diseases, etc.

Castor (Ricinus) – Castor oil is extracted from the seeds of R. Communic and used as lubricant and purgative. Apart from Ricinus there are certain wild herbs and shrubs if the family. Euphorbiaceae which are deadly poisonous.

Beside there other medicinal plants like Rowalfta esrpentina (Sarpagandha)-aconite, Aloe, etc. Sarpagandha is now being cultivated by the Forest Deparment in santhbal Parganas and may be encouraged in this district.

Apart from the above described plants of economical value, there area a lot of herbs and shrub which are of no economic importance.

Palmore-Borassus-flabelli formis (Tal), Phoenix sylvestris (khajur)-Both accur in wild state, The former seems to flourish every where, while the latter grow mostly in wild state. Fruit are edible. Aloe (Ghikawar) wild, generally on hills and rovks. The plant is used medicinal for piles and fissures.

Fresh huice is supposed to be cooling useful in fever. Dried huice is used in constipation. The pulp is given for ladies. ailmenys like menstrual irregularity.

Gramineae (Grass- family)- The dominative member of this family is bamboo, which is noe of the common associates of this district. Bamboo clumps are founr in villages.

Of the folder grass the best known are the Cynoden dactylon (Dub0 grass) groqn in lawn, Panicum colonum (Sawank) used as

folder, a species of arstida (Bhalki, khar), commonly used for making into brooms for house use. Some species of Ardropogen are common in wild state. These are members of Indropogen pollinia, Apluda, Chloris, Aristida, etc.

The vegetation trends in soil containing coal in Dhanbad district

In the used coal mines , ditches and rocky plains mainly tow groups of communities are dominating. firstly, the communities of Lantana (Putush) and secondly, papaver (Regni). The lantana attains some height in rainy season and have attractive pink white or reddish flower. It form a thick fort and become the best competitor.Gradually, it starts reducing its growth and in summer becoines smaller in size and thin in population. Papaver community is never seen associated with the community of Lantana. It seems that the presence of this community is due to the maximum percentage of alkali (42 percent)- in the soil of this district.

Certain parasites and spiphiytes, like lorenthees and orchids are quite common. Orchid culture has not been tried in the gardens.

The carnivorous lpant Drosera which is rare in Chotanagpur area is also found. The plant itself is brown in colour with sticky hair on its body. Yhe plants accur in rocks and only in wimter season remaining up to spring. it was observed that it starts dis-appearing just after the spring and again accurs on the same rock in the beginning of winter. The plants food is insects.

FORESTS

Dhanbad forests Division comprises of all the forest areas situated in Dhanbad district. The forests of this district are mostly confined to the north bordering the forests of mainly Hazaribagh district and part of Santhal Paranas district. The forests lying in the south and east of the district are noly remains and nothing else. The total forest area of this division is 106 square miles.

This division is on off-shoot of the old Manbhum Forest Division prior to the transfer of Purulia Sadar to Bengal. Consequent upon the transfer of territory this division was created synchronizing with the creation of the Dhanbad district from 1st November 1956.

The forests mostly belonged to Private Forest Act; these forests used to be exploited by the owners for only monetary again and the neighbouring villagers cut and remived fuel and timber without much hinderance. The result has been that all the forest are riddled with high stumps and pollarded shoots which will not develop into any quantities of trees unless a colossal amount is spent to cut them down to reasonable height from ground level. Repeated cuttings have caused the disappearance of forests in many areas.

GENERAL.

In the past there used to be shifting cultivation particularly in the remoter regions and this practice is also to a great extent responsible for the disappearance of the forests in many areas. The forets situated on the hill present a formidable problem regarding protection of the forests thereon.

Hunger and unemployment urge hoards of people towards the hill and the helpless remains of the forests have to bear a great onslaught till the forests were almost denuded.

A vast manjority of the forests are burdened with rights. The villagers have the to take free of charges all the produce which they may require own bona fide consumption and not for sale or barter or transfer of any kind either temporary or permanent. They have also the right to graze cattle free of charge in the forests. Forests fo Tundi pahar is completely free right but in the other Reseved Forest areas only Santhal residents have been allowed some rights. there is on restriction for taking minor forest produce like fruits, leaves, edible roots, etc. In Topchanchi the forests of Jharia water Board are the most important. They cover the easten extension of Parasnath are all situated in the catchment area of the Jharia Water Board. They crop is almost formed of miscellaneous species such as Asan, Pausal, Gambar, Sidha,Dhaura, etc. Simal is found mostly in lower slopes. Sal practically non-existent but it occurs locally in a few forests bordering the forests of Giridih. Bamboo is one of the main species, extensive bamboos occur in almost all the forests of this catchment area. The lower parts are completrly denuded of tree growth and lantanas abound. The Tundi pahar and the forests towards the east and north-east form another compact block of forests. Sal is limited to the bottom fringes on the northern side of Tundi hills. The erest of the area contains miscellaneous spcies like Asan mahua, Gambar, Sidha, Bahera, Galgal, Doka, etc. Forests are good where the impact of demand is less but in other areas the condition is deplorable.

Since the abolition of zamindari the foretss are being given proper protection. Afforestation has also been up. There are some forests roads with a mileage of sixty-two. There are forests rest houses at chas, Begnorai amd Manidih.

WILD LIFE-GAME SANCTUARIES, BIRDS

No sanctuary exists in this division and little else is at present done than observing the wild life week and observing the prescribed close season. Measuures to prevent poaching are inadequate. The Santals and other aboriginals have an annial hunt which is a part of their social life which has not been restricted. Tigers, panthers, wild dogs, wild boars and very few antelopes are availaval but not commonly seen. There was indiscriminate slaughter of wild animals in the course of the World war ii . The military used to go out in the nights with spot lights and butcher down hundreds of dear, etc.

DHANBAD.

The Santals who loom large in the forest areas, have been the greatest source of trouble. On occasions, hundreds of them armed with bows and arrows and sometimes with their dogs would visit the forests stealthily and destroy whatever animals they can surprise. In the process of this combing operation, even the smallest birds and rats are not spared.

Consequent upon the taking over of the forests under Government amnagment shooting has completely been restricted. In fact- very few shooting permits have been issused in the last five yearsand this was interded with the idea of restoting the incidence of the wild animals.

AVIFAUNA

The following is a list of birds recorded from the district of Manbhum by S.R. Tickell (1833-36), Beavan (1860-62),V. Ball (1864-71), and E.H.N. Lowther (1930). The rapid industrialization of the district has led to the denudation of the forests and growth of urban areas where avifanua cannot thrive. Moreover the of Purulia Sadar subdivision now transferred to Bengal has ……..of jungales, jheels and water-reservorirs. No scrutiny has been…… in Dhanbad district proper but it is understood that many…….. species are no longer found. This list is being given to show how avifanuna has declined. There are however, still peacocks, peafowls, parridges, wild fowls, lapwings, green-pigeons,snipes, etc., seen in the jungles.

Jungle crow, House Crow, Treepie, Jungle Babbler, Common Babbler, Rufouse- bellied Babbler, Yellow-eyed Babbler, Spotted Babbler, Common lora, Gold-Fronted chlorospsis Jerdon's Chloropsis, Red-Vented Bulbul, Red-whiskered Bulbul, Red-spotted Bluethroat, Brown-backed Robin, Dhayal, Shama, Orange-headed Ground Thrush, Tickell's Blue Flyctcher, Paraside Flyctcher, Madras Black-naped Flyctcher, White-browed Fantail Flycatcher, Spotted Fantail Flycatcher, Bay-backed Shrike, Black-headed Shrike, Wood Shrike,Small Manivet, Large Cuckoo-Shrike, Blick Drongo, White- bellied Drongo, Tailor Bird, Streaked Fantail Warbler, Yellow-browed Willow Warbler, Ashy Wren-Warbler, Jungle Wren- Warbler, Indian Wren –Warble, Golden Oriole, Black-headed Oriole, Rosy Pasteor, Common Myna, Pied Myna Baya, White-backed Munia, White-throated Munia, Spotted Munia, Red Munia, Yellow-throated Sparrow, House Sparrow, Ire-tailed Swallow, Clift Swallow, Large Pied Wagtail, Rufous-winged Bushlark, Red-winged Bushlark, Ashy-crowned Finch-Lark, Whiteeye, Purple Sunbird, Purple-rumped Sunbird, Tickell's Flowerpecker, Thick-billed Flowerpecker, Pitta, Mahratta Woodpecker, Golden-backed Woodpecker, Black-backed Crimson-breasted Barbet, Indian Cuckoo, Pied Crested Cuckoo,

GENERAL.

Koel, Large Green-billed Malkohax, Punjab, Sirkeer, Crow-Pheasant, Large Parakeet, Rose-ringed Parakeet, Blossom-headed Parakeet , Nillkant , Patringa, Blue-tailed Bee-eater,Blue-bearded Bee-eater , Pied Kingfisher, Common Kingfisher, Beaven's Kingfhisher Stork-billed Kingfisher, White-breasted Kingfisher, Large Pied Hornbill, Hoopoe, House Swift, Batassia, Crested Swift , Long-tailed Nightjar, Jungle Nightjar , Franklin's Nightjar, Common Nightjar, Great Horned Owl, Collared Scope Owl , Spotted Owlet, Jungle Owlet, Pondicherry Volture,Griffon Vulture, ,Long-billed Vulture, White-backed Vulture,Scavanger Vulture ,Laggar Falcon, Small Spotted Eagle , Bonelli's Engle , Brahminy Kite, Pariah Kite, Sparrow Hawk, Green Pigeon, Orange-breastet Green Imkperial Pigeon Rufous Turtle Dove, Spotted Dove, Little Brown Dove, Ring Dove Red Turtle Dove, Peafowl, Red Jungle Fowl, Painted Spur Fowl, Jungle Bush Quail, Blewitt's Bush Quail, Black Partridge, Grey Partridge, Bustard Quail, White-breasted Waterhen, Moorhen , Bronze-winged Jacana, Pheasant-tailed Jacana, Stone-Plover, Whiskerea Tern , Little Ringed Plover, Red-wattled Lapwing, Yellow-wattled Lapwing, Little Cormorant, Black Ibis, White-necked Stork, Purple Heron, Green Heron, Little Egret, Catte Egret, Pond Heron, Night Heron. Bittern , Pink-headed Duck and Little Grebe*

FISH.

Many of the tanks and irrigation bandhs are regularly stocked with fry of the Rahu,Mirgal , and Katla species and very small species are to be found in almost every patch of water. Hilsa and Bachwa are caught in thse rivers during the rains. The lakes and bundhs are used for encouraging pisciculture.The details of fisheries will be found in the chapter on "Agriculture and Irrigation."

REPTILES.

Snakes are not specially numerous ; of the poisonous barieties the cobra and karait are fairly common . Of others most frequently seen is the dhamna. In the hilly areas an occasional python is met with and various species of harmless grass snakes are generally common .

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The following year wise figures show deaths due to snakes and wild animals*:-

Year	Deaths due to Snake -bites	Killed by wild Animals.
1957	10	Nil
1958	6	Nil
1959	2	Nil
1960	7	3
1961	5	Nil

THE CLIMATE OF DHANBAD DISTRICT

The climate of this district is characterised by general dryness, except in the monsoon and by a hot summer . The year may be divided into three main season . The cold season is from November to February and is followed by the summer season from March to May . The period June to September is the south-west monsoon season . October is a transitional month between monsoon and winter conditions .

RAINFALL

The district has a network of ten raingauge stations, records of which extend for periods ranging 25 to 91 year . The average annual rainfall in the district is 1306.3 mm (51.43”). The details of the rainfall at these stations and for the district as a whole are given in Tables 1 to 2 .The regions near the northern border of the district get comparatively higher rainfall than others parts of the district . During the south-west monsoon months June to September the district receives 82 per cent of the annual rainfall . July is the rainiest months. The variation in the rainfall from year to year is not large.In the fifty-year period 1901 to1950 the highest annual rainfall amounting to 135 per cent of the normal occurred in 1917 while the lowest annual rainfall which was 74 per cent of the normal occurred in 1910. In the same fifty-year period there were only3 year in which the rainfall in the district was less than 80 per cent of the normal no two of them consecutive. But at a few stations such low rainfall in two consecutive year has occurred once in the fifty-year period. It will be seen from Table 2 that the rainfall was between 1,100 and 1,600 mm (43.31 and 62.99”) in 42 years out of fifty. On an average there are 70 rainy days (i.e. days with rainfall of 2.5 mm – 10 cents-or more) in a year. This number varies from 61 at Bagmara to 82 at Rajdaha .

The heaviest rainfall in 24 hours recorded at any station in the district was 272.mm (10.71”) at Dhanbad on 1931 August 8.

Temperature.

The only meteorological observatory in the district is at Dhanbad . Temperature and other data this station may be taken

*SOURCE – Jharia Water Board of Health , Dhanbad .

as representative of the climatic conditions in the district as a whole . Temperatures begin to decrease progressively from November. January is the coldest month with the mean daily maximum temperature at about 24.5º C (76.1º F) and the mean daily minimum at 11.9º C(53.4º F) . In association with cold waves which affect the district in the winter months , in the wake of western disturbances which move across north India , the minimum temperature may go down to about 5.0 º C(41.0 º F) After February the temperatures rise steadily till May which is the hottest month when the mean daily maximum temperature is 38.3 º C(100.9 º F) and the mean daily minimum is 25.6 ºC(78.1 º F). In May and the early part of June before the onset of the south-west monsoon, maximum temperature may reach 45 º C(113 ºF) or above on some days . With the advance of the south-west monsoon into the district by about the second week of June weather becomes appreciably cooler and continues to be so throughout the season . From October temperatures begin to decrease .

The highest maximum temperature recorded at Dhanbad was 46.1 º C(115.0 ºF)on 1944 May 28 and 1942 June 10. The lowest minimum temperature was 5.0 ºC(41.0 ºF)on 1950 February 12.

HUMIDITY.

Except in the south-west monsoon season when the relative humidities are high the air is generally dry. The summer months are the driest with low relative humidities especially in the afternoons .

CLOUDINESS

In the winter and the early part of summer skies are generally clear or lightly clouded . The cloudiness increases in April and May, particularly in the afternoons . During the south-west monsoon season skies are heavily clouded or overcast .

WINDS.

Winds are generally light to moderate with a slight increase in force in thes summer and monsoon seasons . In May and the monsoon season winds are predominantly from the east or south-east . In October winds are variable in direction . In the winter season and the first half of summer winds are mainly from directions between west and north.

SPECIAL WEATHER PHENOMENA.

Depressions originating in the Bay of Bengal during the monsoon season affect the district and its neighbourhood during their movement in a westerly direction after crossing the coast and cause gusty winds and widespread heavy rain . Thunderstorms occur during the period March to October . those in the summer season being accompanied with squalls and hail , very occasionally. Dust raising windsare common in the summer season . fogs sometimes occur in thes winter months. **Table 3,4 and 5 give the temperature and humidity , mean wind speed and the frequency of special weather phenomena respectively f[illegible]anbad.**

DHANBAD.

TABLE 1.

Normal and

Station	Number of years data	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
1	2	3	4	5	6	7	8	9	10
Gobindpur	50(a)	13.5	28.7	21.6	20.3	57.9	192.9	328.9	317.3
	(b)	1.2	2.4	1.6	1.8	3.9	10.5	16.7	16.2
Chas	49(a)	15.7	26.2	20.1	13.7	50.3	179.8	326.9	307.9
	(b)	1.4	2.1	1.4	1.3	3.2	9.0	15.4	15.2
Dhanbad	44(a)	14.0	26.9	18.8	16.5	48.5	192.0	333.5	338.3
	(b)	1.1	2.4	1.7	2.0	4.1	10.5	17.7	15.9
Topchanchi	37 (a)	20.1	29.2	18.8	19.3	56.4	211.6	398.0	350.8
	(b)	1.5	2.2	1.7	1.7	4.1	11.0	19.8	18.1
Tundi	36 (a)	20.6	32.0	16.5	20.3	56.1	218.4	380.7	356.6
	(b)	1.4	2.0	1.3	1.6	3.5	10.4	17.7	17.8
Rajdaha	35 (a)	21.1	26.4	16.3	15.7	56.6	217.2	407.2	356.4
	(b)	1.6	2.2	1.7	1.7	4.1	11.7	20.5	19.3
Pokhuria	31 (A)	12.9	26.7	15.7	20.3	48.0	198.6	313.7	292.3
	(B)	1.2	2.1	1.2	1.7	3.6	10.6	16.1	15.2
Bagmara	15(a)	6.3	16.0	25.7	15.5	37.9	162.6	287.5	279.5
	(B)	0.7	1.4	2.0	1.0	2.8	8.8	15.1	15.
Katras	15(A)	14.5	20.1	22.1	17.0	46.0	159.3	373.4	313.
	(b)	1.2	1.7	1.6	1.9	3.1	8.0	16.3	15.
Pandra	43 (a)	12.5	27.7	21.1	17.8	54.9	204.2	288.8	288.
	(b)	1.0	2.5	1.7	1.7	4.0	10.6	16.7	16.
Dhanbad	(a)	15.1	26.0	19.7	17.6	51.3	193.7	343.9	320
(District)	(b)	1.2	2.1	1.6	1.6	3.6	10.1	17.2	16.

(a) Normal rainfall in mm. (b) Average number

GENERAL.

Extremes of Rainfall.

Sept	Oct	Nov	dec	Annual	Highest Annual Rainfall As per Cent of Normal And year	Lowest Annual Rainfall As per Cent of Normal And year	Heaviest rainfall in 24 hours	
							Amount (mm .)	Date
11	12	13	14	15	16	17	18	19
209.5 10.7	94.0 4.0	10.4 0.7	3.3 0.4	1298.2 70.1	151 (1917)	70 (1912)	248.9	1913 Aug.7.
207.5 9.5	78.7 3.5	11.4 0.7	3.1 0.43	1241.3 63.0	140 (1924)	68 (1934)	231.9	1935 Aug. 12.
213.4 10.7	90.4 4.6	12.9 0.7	3.8 0.3	1309.9 71.7	134 (1922)	74 (1925)	272.0	1913 Aug. 8.
228.6 11.7	103.9 5.0	12.9 0.9	0.8 0.4	1454.4 78.1	126 (1917)	54 (1938)	228.6	1958 Sept.29
214.5 10.8	107.2 3.9	14.2 0.8	5.1 0.4	1469 .0 71.6	143 (1929)	69 (1921)	170.2	1949 June 12.
236.5 12.9	104.7 5.0	14.0 1.1	5.6 0.5	1477.7 82.4	124 (1929)	62 (1930)	214.6	1985 Sept.16
206.8 10.6	78.5 4.3	11.2 0.7	3.8 0.4	1228.5 60.5	144 (1922)	75 (1932)	153.7	1913 Aug.7.
184.7 9.3	100.3 4.0	6.1 0.7	6.1 0.6	1128.461.4	125 (1941)	54 (1947)	153.7	1913 oct.7
196.9 10.9	88.4 3.8	5.3 0.5	2.8 0.3	1259.564.6	134 (1942)	75 (1945)	254.0	1943 Juiy.16
181.1 10.4	85.6 4.0	11.2 0.7	2.8 0.4	1196.269.9	145 (1917)	73 (1915)	268.5	1902 Sept.5.
210.7 10.8	93.2 4.2	10.9 0.7	4.1 0.4	1306.370.0	135 (1917)	74 (1910)	…….	……

rainy days(days with rain of 2.5mm. or more).

data upto 1985.

in brackets.

DHANBAD.

TABLE 2.

Frequency of Annual Rainfall in the District.

(date 1901-50)

Range in mm.		Number of years.	Range in mm.		Number of years.
901- 1000	..	2	1401-1500	..	8
1001- 1100	..	3	1501- 1600	..	4
1101- 1200	..	11	1601- 1700	..	2
1201- 1300	..	9	1701-1800	..	1
1301-1400	..	10	..	..	..

GENERAL.

TABLE 3.

Normals of temperature and Relative humidity

(Dhanbad)

Month	Mean Daily Maximum Temperature		Mean Daily Maximum Temperature		Highest Maximum Ever recorded	Lowest Minimum ever recorded					Relatiye Humidity 0830	
			oc	oc	oc	Date		Oc	Date		Percent	
1	2	3	4	5	6	7	8	9	10	11	12	
January	..	..	24.5	11.9	32.2	1950 Jan.22	..	7.2	1955 Jan.7	..	60	
February	..	..	26.7	14.1	38.3	1950 Fer.12	..	5.0	1950 Feb.12	..	56	
March	..	..	33.0	18.9	40.6	1955 Mar.22	..	11.7	1945 Mar.8	..	40	
April	..	..	37.2	23.2	43.9	1954 Apr19.	..	13.3	1949MApr 22	..	42	
May	..	..	38.3	25.6	46.1	1944 May28	..	18.3	1949 May 7	..	59	
June	..	..	35.4	25.9	46.1	1942 June10	..	18.3	1943 June 4	..	71	
July	..	..	31.0	24.9	36.7	1958 July8	..	21.7	1951 July 26	..	84	
August	..	..	30.6	24.6	36.1	1951 Aug.2	..	21.7	1953 Aug.27	..	85	
September	..	..	31.1	24.2	35.1	1958 Sept.4	..	20.6	1950 Sept.27	..	83	
October	..	..	30.4	20.9	35.6	1951 Oct.19	..	14.4	1954 Oct.30	..	72	
November	..	..	27.7	15.4	32.8	1950 Nov.3	..	9.4	1952 Nov.30	..	58	
December	..	..	24.8	12.2	30.6	1950 Dec.28	..	7.2	1955 Dec.28	..	57	
Annual	..	..	30.9	20.1	..	..	..	..	..	..	64	

*Hours I.S.T.

DHANBAD.

TABLE 4.

Msan wind speed in Km./hr.

(Dhanbad)

Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Seot.	Oct.	Nov.	Dec.	Annual
1	2	3	4	5	6	7	8	9	10	11	12	13
6.9	8.2	9.8	10.1	9.8	9.7	9.5	8.9	7.6	6.4	6.9	7.1	8.4

TABLE 5.

Speciaal Weather Phenomena

(Dhanbad)

Mean no. of Days With	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Seot.	Oct.	Nov.	Dec.	Annual
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Thunder	0.6	1.3	2.6	3.7	6.1	12.1	11.5	12.0	12.3	4.2	0.2	0.8	67.4
Hail	0.0	0.0	0.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Dust-stoer	0.0	0.3	0.3	1.1	1.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	3.6
Squall	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5
Fog	2.4	0.5	3.4	.07	0.1	0.0	0.1	0.4	0.3	1.0	1.1	4.7	14.7