PART I

PHYSICAL BASIS
CHAPTER I

HISTORICAL BACKGROUND

In the Baghelkhand region a sequential historical development may be seen which has resulted from the changing relations between physical, biotic and cultural environments from the remotest antiquity of the palaeolithic age to the present scientific and technological era. The historical events which have taken place are intimately linked with the evolution of the tribal life, both of which are subject to the contemporary socio-economic and political conditions of the region. Baghelkhand has experienced four such broad periods representing varying degrees of historical change i) the Ancient period, ii) the Mediaeval period, iii) the Pre-Independence period, and iv) the Post-Independence period.

ANCIENT PERIOD

The cultural evolution of the region can be traced back to very early times. In 1866-68 A.D., Carlyle discovered a large number of pigmy flints of the neolithic age in Rewa. Archaeological remnants give certain clues regarding the earliest life of man in the region. The microliths, polished stone, celts, choppers or chopping
tools, pebble tools, hand axes and rock drawings depicting wild animals, hunting spears and bows and arrows, hunting scene etc. found in the Son valley, Kaimur ranges and a few scattered localities in the south indicate the level of palaeolithic life in this tract. These archaeological remains present a process of the evolution of the manner of life and economy which man achieved through a gradual utilization of the resources with the increasing necessities of life.

The early settlers had to live in an inhospitable environment. They had to depend on whatever nature offered effortlessly. Besides Rewa, in Son Valley and Kaimur Ranges, rock painting and engravings have also been discovered in the Ambikapur in Surguja district and stone bone pot-sherds have been obtained in several of the rock shelters. These relics found along with the paintings have been found useful for the study of the material culture of the people inhabiting the rock shelters. Bajpai establishes the date of earliest paintings sometime about 6000 B.C.


The last paintings, in terms of time, may be ascribed to 8th to 9th century A.D. Thus, it appears that long before the advent of Rigvedic Aryans in the Indian subcontinent, the areas coming under the purview of the present study were occupied by people who had developed a culture of their own. The aspirations and cultural attainments of these people have been faithfully reflected in the rock paintings and in the discovery of various objects from the different cultural levels of a number of sites. Centres of culture and civilization gradually evolved in the valley of the Son river and other river valleys. The stone age people first settled in these valleys where they found a moderate climate and abundant sources of livelihood. Later, chalcolithic people made their homes near the banks of the rivers. They found the clay of the river banks suitable for pottery and for cultivation. In course of time, important cities like Saubhagayapur, Kakaredica etc. sprang up on the banks of Son river and left their mark on the history of ancient India.3

The early history of Baghelkhand region is extremely obscure. Historical evidence points out that the region was split up into a number of tracts inhabited by Dravadian tribes - Gonds, Kols, Baigens etc. These tribes were organised under their respective chiefs and were in perpetual internecine wars with one another. Some 1700 years ago, they were attacked by Rakel Rajputs from Kundri in Palamau District and subjugated. Records, anecdotes, and travel accounts show that prior to the Rajput occupation of the central part of India in the 12th century A.D., the tribes were owners of land and property and were rulers in most parts of the region. The early Buddhist books, the Mahabharat, the Ramayana and the Puranas, all have been related this region with the Haihaya, Kalachuri or Chedi clans. Nothing definite is known of the rise of these clans, but the fact that they employ in their dated records an era of which the initial year corresponds to A.D.249 points to their having become a tribe of local importance somewhere about the third century. Their original habitat has always

been on the Narbada, with Mahishmati or Maheshwar as their capital town. From this position they appear to have been driven eastwards and to have finally acquired Kalinjar, where Krishna Chedi is said to have slain an evil-minded king who practised cannibalism. With this stronghold as a base, they gradually extended their dominions over what is now known as Baghelkhand. During the fourth and fifth centuries, the Gupta dynasty of Magadh was paramount over this region, as is shown by the records of the feudatory chiefs of the Uchhakalpa family and the Parivrajaka Rajor of Kho. In one of these records the king is stated to have sought to give prosperity to the kingdom of Dahala together with the eighteen forest kingdoms. Special interest attaches to the term forest kingdoms, as it is also employed by Samudra Gupta in the Allahabad pillar inscription, when detailing his conquests; it refers no doubt to the chiefs of this region, some of whom may possibly have been Haihayas. In the sixth century, the Kalacheria must have become the ruling clan of some importance, as the Badami king Manglisa records his victory over Budha Varman Kalchuri

5 ibid.
6 ibid.
of Chedi and the Birhat Sanhita, written during the same period, mentions the Chaidyas as an important central Indian tribe. During the later part of the seventh century the Kalachuris rapidly acquired the sovereignty of the whole tract which came to be called after them Chedidesa or the land of the Chedis. Their chief stronghold was Kalinjar. During this period the Chandelas were rising to power in Bundelkhand, the Parmars in Malwa, the Rashtrakutas in Kanauj, and the Chalukyas in Gujarat and southern India. The records of these clans refer to many of their contests and alliances. The Kalacharis received their first blow at the hand of the Chandela chief Gosovarma (925-55), who seized the fort of Kalinjar and its surrounding district, he and his successors assuming thenceforth the ancient Kalachuri title of 'Lord of Kalinjar'. The Kalachuris were still, however, a powerful tribe and continued to hold most of their possessions until the twelfth century.

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7 Imperial Gazetteer of India, 1908, Vol.VI, p.23.
MEDIEVAL PERIOD

It is not quite certain when the Baghels established themselves in this region. After the advent of Mohammadans, the power of the Kalcuris was broken and the country fell to the, Bhass, Chauhans, Sengars, Gonds, and other clans. There is no proof that the Baghelas entered the region before the tenth century, after the destruction of their kingdoms in Gujarat by Ulugh Khan in 926 A.D. From this time onward the history of the country become that of Rewa State.8

The Rewa chiefs claim to be Vaghela Rajputs, tracing their descent from the Chalukya or Solanki rulers of Anahila-Pataka. Baghelkhand was named after the ruling house of Rewa. It was, however, known to the Mohammadan historians9 as Bhata or Bhatgora.

Lavanprasada of the village Udyaghrapalli or Vagela (Gujarat) was the governor of Udyagiri and Vidisha under the rulers of Anhila-Pataka. From the state records of Rewa, it appears that Viradhavala, the son of the

8 ibid., pp.187-188.
Lavanprasada, migrated to Marpha, 27 km north-east of Kalanjara, in 631 A.H. or 1233-34 A.D. He was succeeded by his eldest son, Karandeva who married the daughter of the Kalachuri ruler of Ratanpur and received the Bandogarh fort as dowry. Karandeva moved from Marpha and established himself at Bandogarh.

The earliest historical reference to a Vaghela Chief of Rewa pertains to the region of Bahlol Lodi (1451-89). The Vaghela chief at the time was Raja Bhira or Bhaira and he assisted Hussain Shah of Jaunpur against Bahlol Lodi. Raja Bhir is said to have offered allegiance to Sinkandar Lodi (1489-1517), who attacked Bandogarh during the reign of Salivahana Vaghela, but failed to capture it, and later sacked the country as far as Banda.

Salivahana was succeeded by his son Virasimha about 1500. He was on good terms with Sikandar Lodi. According to the Akbarnama of Abul Fazal, he gave asylum to Aman Das who later became famous as Sangram Shah, the father-in-law of the celebrated Durgavati. Virasimha is

10 Elliot, *The History of India as told by its own historians*, Vol. 4, p. 346.
11 ibid., Vol. 6, p. 32.
the 'Narasimha' who was mentioned by Babur as assisting Rana Sangramasimha at the battle of Kanwah (March 16, 1527) with 4,000 horsemen. He later received the Bhata territories as Nankar jagir (maintenance grant) from Babur.

During the reign of Akbar, the Baghelkhand region fell partly in the Bhatghora and partly in the Kalanjara Sarkar of the Allahabad Subha. Maharaja Ram Chandra Vaghel of Bandogarh is said to have presented his celebrated court musician Tansen Kalawant to the Mughal Emperor Akbar. Aurangzeb is said to have separated the districts round Rewa from Bhatgora and brought them together under Kalanjara Sarkar.

PRE-INDEPENDENCE PERIOD

During the pre-independence period, between the region 17th century and second half of the 18th century, was swept over repeatedly by the Marathas. This period was marked by

13 Erskin, Babar's Memories, p.360.
14 The Rewah State Records- The Administrative Section.
wide settlement and colonization in the hitherto 'jungle areas'. Many non-tribal Hindu castes, famous for their agricultural pursuits, like the Ahirs and Kurmis, came and settled there. As is the general process, the tribals were either pushed out or they themselves withdrew where they could maintain their cultural identity and way of life unruffled; though it was hard upon them as the resources of sustenance becomes scarcer with increasing elevation and inaccessibility. Some of the tribes, however learnt, techniques of cultivation and other traits of Hindu culture. The tribal habitats are the most unaccessible and unpromising areas of the region with unhealthy tracts of very uneven and rugged terrain, thin and stony soils and widespread jungles. The entire region is a tangled mass of hills and plains. Because of its hilly and inaccessible nature, the Baghelkhand plateau of Central India is a safer place than the plains and has also been the land of promise as a sanctuary for a number of local rulers and patriots who could defy the foreign powers and maintain their independence for a major part of historical part. As such, when the region came under the British
rule, it remained both under them directly and also as congeries of petty states of varying dimensions, the British being the paramount power.

After the disturbances of 1857, a political officer was attached to the Rewa Darbar, and was at the same time put in charge of the minor holdings of Maihar, Nagod Sohawat, and Kathi. In 1862 this officer was withdrawn at the request of the Rewa Durbar and these states were placed under a political agent in Bundelkhand. In 1871 Baghelkhand was put in charge of a separate officer with his headquarters at Satna. In 1896, the states of Baraunda, Jaso and the five Chaube Jagirs were transferred from Bundelkhand to Baghelkhand. Rewa alone was held under a treaty, the remaining states and estates being Sanad holdings. All transit dues in the Agency were abolished.

The political agent exercise the usual general supervision over the affairs of the states, and in the case of all but Rewa, personally dealt with crimes of heinous character. In the portion of the Jhansai Railway which was in the estates of Pahara and Taraon, the political agent exercised the powers of a District Magistrate
and a court of sessions. The agency surgeon supervised medical arrangements.

While the actual administrative units were the states and estates in the Agency, its political control remained with the Government of India, working through its political offices. The political charges, which were formed before 1891, have been described in the 1891 census reports as 'artificial' and unstable, for these were 'merely convenient groupings of states' with a view to exerting control by the political officers. Again, it was pointed out that the various states of the Agency intermingled in such a manner that one state often had possession in several political charges. The adjustment of internal areas became a matter of great difficulty in view of the lack of a complete survey, desire to inflate the size of possessions and the frequent omission in state survey of the areas of feudatories and of wastes and forest lands. The census reports of 1931, however, claim some amount of accuracy or trustworthiness of returns for Central India.

The process of change continued. After the census of 1931, the Bundelkhand and Baghelkhand Agencies were amalgamated into one charge.\(^{21}\)

Ultimately, the system of treating the political charges as units was abandoned. In its place, every state with a population of 16,000 and above was shown as an independent unit.\(^{22}\)

These administrative divisions were a legacy from the first quarter of the nineteenth century and they continued for more than a decade from 1931. Thus in the census of 1941, Central India was almost a crazy network of princely states, each under a hereditary ruler and a self-sufficient world within itself.\(^{23}\)

The historico-cultural development in the region since pre-historic period to the present has been the result of the changing physical, biotic and cultural environments. From the study it is obvious that the historical events that have taken place in this region

\(^{22}\) ibid., pp.4-5.
have had a powerful impact on the evolution of the tribal life stages which has been influenced by the socio-economic and cultural environment which has been changing rapidly under the pressure of circumstances.

Districts Sidhi and Shahdol of Baghelkhand Agency were part of Vindhya Pradesh. This State was formed in 1948 by the Union of 34 States of the Bundelkhand and Baghelkhand Political Agencies of Central India and the State of the Gwalior Presidency, i.e., Khanniadhana, after the integration and transfer of the enclaves, on March 1, 1951. The Surguja district was part of Madhya Bharat, which started on its career on the May 28, 1948 and the Constitution of India gave the State the status of a Part B State.

The post-independence structure of the State of Indian Union is partly the result of accident and circumstances attending the growth of the British power in India and partly a by-product of the historic process of the integration of former Indian States. The map of the

24 Census of India 1951, Vol.16, Part I, Vindhya Pradesh'.
territories annexed and directly ruled by the British was not shaped by any rational or scientific planning but mainly by the military, political or administrative exigencies of the time. The necessity of reorganization of provinces on a rational basis was pointed out even by the authors of the Report on Indian Constitutional Reforms, 1918. The Indian Statutory Commission of 1930 also upheld the same opinion.

Immediately after Independence, a revolutionary change came over in the former princely States with dramatic speed. In addition to factors like linguistic and ethnic homogeniety or historical tradition, the compulsion of certain dynamic urges of the time necessiated quick decisions.

Madhya Pradesh of 1951 was a composite State (Madhya Bharat, Bhopal and Vindhya Pradesh). The people of the eight Marathi-speaking districts became vociferous

29 The Eight Marathi-speaking districts are as follows, viz., 1) Buldana, 2) Akola, 3) Amaravati, 4) Yeotmala, 5) Wardha, 6) Nagpur, 7) Bhandara and 8) Chanda. Of these Akola, Amaravati, Buldana and Yeotmala were in Berar.
in demanding the separation of these areas. It was part of Mahavidarbha Movement, the origin of which can be traced back to 1905. But though the States Reorganization Commission recommended the creation of the Vidarbha State, the people of the area ultimately reconciled themselves to merging with Maharashtra, the Marathi-speaking State of the Indian Union.

Along with the question of separation of the Marathi-speaking areas, the question of the other Hindi-speaking units of Central India, namely Vindhya Pradesh, Bhopal and Madhya Bharat, naturally arose. The Mahakosal Pradeshi Congress Committee suggested the formation of a State consisting of the Hindi-speaking areas of the then Madhya Pradesh, the Malwa portion of Madhya Bharat and the whole of Vindhya Pradesh and Bhopal. There was little doubt, as held by the Commission, that from the point of view of Bhopal and Vindhya Pradesh, the advantages of

becoming an integral part of a richly endowed State would more than compensate for the initial disadvantages, if any. Regarding the Union of Madhya Bharat with Madhya Pradesh, the Commission also suggested with equal emphasis, that in the long run the formation of bigger unit will be desirable.\(^3\)

These facts were widely appreciated. There was a remarkable consensus with regard to the formation of a large State comprising the Hindi-speaking areas of Central India. Accordingly, the Commission recommended inclusion of the following areas in the proposed State:

(a) the 14 districts of residuary Madhya Pradesh,
(b) the Bhopal State
(c) the State of Vindhya Pradesh
(d) Madhya Bharat, except the Sunel enclave of the Mandsaur District, and
(e) the Sironj Sub-division of the Kota District of Rajasthan.

Thus, the State of Madhya Pradesh was formed on November 1, 1956, under the provisions of the States Reorganization Act, 1956. The new State became a compact

\(^3\) ibid., p.128.
unit in spite of the observation that boundaries are still arbitrary and in places fantastic.\textsuperscript{35} It was appropriately named Madhya Pradesh.\textsuperscript{36}

The Census of India 1961, Vol.VIII, Part I-A Reports, gives the names of following 43 districts and 7 division into which the State of Madhya Pradesh is now divided:

<table>
<thead>
<tr>
<th>Division</th>
<th>District</th>
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| B. Rewa   | 1. Tikamgarh, 2. Chhatarpur, 3. Panna,  
| C. Indore | 1. Mandsaur (Mandasor), 2. Ratlam,  
|           | 3. Ujjain, 4. Jhabua, 5. Dhar,  
|           | 6. Indore, 7. Dewas, 8. West Nimar (Khargone), 9. East Nimar (Khandwa) |
| D. Bhopal | 1. Shajpur, 2. Rajgarh, 3. Vidisha,  

\textsuperscript{35} Spate, I.H.K., \textit{India and Pakistan}, p.565.  
\textsuperscript{36} Reports of the States Reorganization Commission, 1955, p.132.
Thus, the Baghelkhand region is now part of Madhya Pradesh, comprising the districts of Sidhi, Shahdol and Surguja.
No realistic understanding of the tribes of Baghelkhand region and their culture is possible unless it is recognized that the surface of the earth undergoes changes independently of human activity. To give a background for the understanding of present day relationships between these tribes and their environment, this chapter deals with the physical conditions of this area which affect the tribes and their culture either directly or indirectly.

The Baghelkhand region is located in northeastern Madhya Pradesh and includes the districts of Sidhi, Shahdol and Surguja (Fig. 2.1). This region, with a large tribal population, lags far behind in socio-economic development as compared with other parts of the State.

Baghelkhand belongs to the mesolevel Vindhyan-Baghelkhand region of India where the process of modern economic development has recently been accelerated. This

region lies between $22^\circ 21'\ N$ to $24^\circ 21'\ N$ and $81^\circ 20'\ W$ to $84^\circ 22'\ W$ and covers an area of 46,897 sq. km with a tribal population of 1,843,279 according to the Census of India, 1981. The tribes – Baiga, Bhumia, Gonds, Kols, Kawar, Oraon etc. constitute about 46.50 per cent of the region's total population of 3.96 million.

Baghelkhand may be described in general terms as a secluded basin. On the east of the Maikal plateau and north of the Chattisgarh Basin lie two important coal basins of lower Gondwana age – Sohagpur Basin in the west and Surguja Basin in the east, separated by Deogarh Hills. The rim of the Surguja Basin consists of Archean metamorphic rocks in the east, of coarse sandstone of the Upper Gondwana rocks in the north and isolated flat topped mesas with laterite cappings, locally known as "pats", rise above the floor of the basin (Fig.2.2). The Mainpat (1,152 m), however, stands in the south of the basin. The Jamirpat in the east represents a penneplain at an elevation of about 1,000 m, above which isolated monact rocks rise another 200 m. On the north, the Deogarh Hills formed by Gondwana sandstone are considerably dissected and all the rivers which flow northwards across this region appear to be of superposed type. The Rihand is a typical example.

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GEOL OGY AND MINERAL RESOURCES

A. Geology

The geological formations found in Baghelkhand region are represented by the Archaeans including schistose and granitoid rocks (Fig. 2.3). The belt of Sidhi-Shahdol-Surguja includes older metamorphics—metamorphic rocks generally called Sidhi Group or Sidhi granite, gneiss and granite of Surguja and Shahdol districts. A description of these groups is being given in the following paragraphs.

Sidhi Group

In Sidhi area the Archaeans are represented by older metamorphics and Sidhi Group with an intervening unconformity. The older metamorphics comprise different varieties of basic schists traversed by basic intrusives, granites and quartz veins. The Sidhi Group consists of banded haematite and magnetite-quartzites, phyllites, and orthoquartzites. The older metamorphics have undergone metamorphism of green schist facies, whereas the overlying, Sidhi Group, exhibits very low grade metamorphism.

The rocks are tightly folded into isoclinal folds, plunging either east-northeast or west-southwest. Both compressional and shear folding have affected the area.
Shahdol Group

In Shahdol area the main rock types are Chloritetic schists, hornblende-schists, banded magnetite-jasper-quartzites, phyllites associated with epidote bands and dolomites, probably of Dharwarian age. The general strike direction varies from northeast-southwest to west-northwest-east-southeast.

The area presents a complex structural history with a number of asymmetrical folds, faults and fractures, including probably a thrust affecting all rock formations.

In this area the Archaean s are represented by older metamorphics and granite intrusives. The older metamorphics include slates, phyllites, mica-schists and quartzites. The granitoids consist of granite-gneiss, granodiorites, pegmatites, aplites and quartz veins.

The metasediments of the area form a belt of overturned folds, the fold axes trending east-west. In the vicinity of Bhilai-Dhorpur area of Surguja district, the fold axes are in west-northwest-east-southeast and northwest-southeast. Along the anticlinal axes of these cross folds there are plutons of granite and granodiorites, and in the synclinal parts there are minor intrusives of granite porphyry and quartz veins.
The Gondwana sediments in this region occupy a large continuous patch and are divided into Talchir, Barkar, Panchet, and Mahadeva.

**Talchirs**

These overlie the Archaens unconformably along the margins of Ramkola and Bisrampur coalfields in Surguja district and comprise boulder beds, sandstone and shales. These are also noticed at Jhilmili and Sohagpur areas in Surguja and Shahdol districts respectively. The Umaria marine bed succeeds the Talchirs with a slight unconformity and is found underlying the coal-bearing Barakars. The marine bed 3 metre thick consisting of sandstone and clays are noticed near Umaria, Annuppur and Manendragarh. It is fossiliferous and includes the remains of *Spiriferina*, *Reticularia*, and a few gastropods.

**Barkars**

The Barkars are represented by sandstone, shale and coal seams as noticed in Bisrampur, Lakhanpur, Jhilmili and Sohagpur areas. Many workable deposits of coal are found in them.
Panchets

These are divided into Parsora and Tiki Formations. The Parsora Formation consists of fine-grained ferruginous shales associated with felspathic sandstone and is well developed at Parsora village near Sohagpur. Tiki Formation comprises sandstone with clay balls, noticed 65 km northeast of Parsora. It is fossiliferous and shows remains of Labrynthodonts.

Mahadevas

These are well developed in Bisrampur and Sonhat areas and consist of grits, shales and pebbly conglomerate with sandstone.

Jabalpuras

These are noticed to the West of Sohagpur area, consisting of shales and felspathic sandstone characterised by the presence of plant fossils.

STRUCTURE

In Gondwana Coal Measures, the preservation of the coal as well as associated sediments is mainly due to the trough faulting. Echelon type of boundary faults between Gondwanas and Precambrians are noticed in each
coalfield. The Gondwanas of this region are also traversed by a series of faults, as noticed in Bisrampur and Lakhanpur areas. In Sohagpur area dykes and silts of basalts belonging to Deccan Trap are noticed intruding the Gondwanas. In Umaria-Karor area, the Talchirs exhibit gentle anticlinal structures south-southeast of Majhgawan (23°37':80°15').

Nimar Sandstone, Bagh Group and Lameta Group

These rocks which are closely associated with each other occur as thin disconnected bodies, mainly outskirting the Deccan Trap pile in Shahdol and Surguja districts. The Lametas occur mainly in the western part of Shahdol and southeastern part of Surguja district. These rocks occur below the Deccan Trap pile, the lowest flows of which in different places may be of different time, and on generally the Archaean metamorphics and granitoids, Bijawars and Vindhyans below.

Deccan Trap

The lava flows of Cretaceous-Paleocene age is collectively named as Deccan Trap and locally in the region as Malwa Trap. The Deccan Trap has been a major source of bauxite in the region. The development of laterite profile due to weathering of the trap rocks in Surguja
district has resulted in the formation of bauxite bodies. Agate which forms amygdules is worked on a very small scale for ornamental purposes. Chalcopyrite and native copper found in the trap rocks are too low in concentration to be economically workable. It is also a major source of good road metal and stone chips and is being extensively used.

**Inter-Trappean Beds**

The successive sheets of lava in various places are separated by sedimentary deposits comprising irregular patchy bodies of cherts, impure siliceous limestones, clays and pyroclastic materials, which have been called Inter Trappean beds. Sometimes they include substantial amount of volcanic detritus and may be composed almost entirely of such material. These beds generally vary in width from 0.5 m to 3.0 m and are of variable but not extensive horizontal extent though at a few places they occur as thin streaks or even upto 5.0 m thickness. Sometimes they occur as small insignificant streaks or patches. These Inter-Trappeans are found to contain at places fossil shells of Gastropods, Lamelibranches and plant remains. These beds are of fresh water origin. In the region the Inter-Trappean beds are seen to concentrate
in the lower part of the trap pile. These Inter-Trappean beds yield plant and animal fossils which are largely considered to be of Tertiary age.

Because of impure nature of the Inter-Trappean beds, they are not of much economic significance. Tests on Red Bole and clay horizon have so far failed to show presence of any significant deposits of potash.

Alluvial Deposits

The alluvial deposits of the Son valley contain the Older Alluvium of the Middle Pleistocene age. Variation in the age of the alluvial deposits is shown by alluvial terraces. The hard cemented gravels contain rich concentration of vertebrate fossils, mainly belonging to Proboscidia, Boviidae, Suidae, Equidae etc. Stone artifacts are also common in the gravel beds. The sand gravel beds form prolific aquifers whose average thickness is generally 30 metres.

B. Mineral Resources

The widely distributed Archaean and Gondwana rocks of the Baghelkhand region contain a variety of minerals.

For instance, the region contains more than 84.1 per cent of coal reserves (144,467 million tonnes) of the state or 15.4 per cent of that of the country. Similarly, 15.7 per cent estimated reserves of bauxite and 21.0 per cent clays of the state are confined within this plateau. Besides, sizable reserves of limestone, corundum, corundum sillimanite and fluospar are also known to be there. It is worth mentioning that the plateau accounts for Rs.227.74 million in 1971 i.e., about 34.0 per cent of the State's mineral output which works at about 4.5 per cent of the country's total volume of mineral output. But most of the produced minerals are exported, and therefore, they have hardly made any contribution to the economic and industrial development of this region. Economic activities related to them are limited to mining and export. It is ironic that the Amarkantak Thermal Power Station, one of the three large power stations of the State, with a generating capacity of 110 Megawatts was commissioned during the Third Five Year Plan near Shahdol, but only 5.9 per cent of the villages could be electrified and the generating capacity of this power station has since gone upto 240 Megawatts.

Among the important metallic minerals of the region are iron-ore, bauxite and manganese. Iron-ore
occurs in the Bijawar rocks of Gopudbanas and Singrauli tahsils in lateritic form with a metal content of 55 per cent. However, the ore does not occur in large quantity at any one place. Hence it has not been exploited on a commercial scale. Presently, local ores are being used for the manufacture of agricultural implements and articles of domestic use. Mining is being carried on in open pits with an average production of 50 to 60 thousand tonnes. Most of the bauxite mined is being used in the manufacture of firebricks, pottery, sanitary pipes etc. and is exported too. At Amarkantak, its quarrying has been taken up recently by the Birlas. The ore of the saucer shaped basin here contains nearly 60 per cent of alumina. It is mostly exported to Renukut for the Hindalco Factory. Manganese and copper deposits have recently been located in Gandhigram area in Sidhi District. Limestone, building stone and clay-ore are the principal non-metallic minerals of the Upper Son Basin. The region is famous for its limestone which spreads from one end of the Son trough to the other. Its important mining centres are Jukehi and Kymore. The Vindhyan limestone and sandstone are widely used for making flooring tiles and as roof and wall materials. Clay is widely found in Shahdol district with silicate
content well above 60 per cent. It is extensively quarried and is used for making refractory, structural, domestic and electrical goods. Baryta is found at Andhiyar-Khoh, Bharra (Sidhi district) in dolomitic limestone belonging to Bijawar series. It is mostly used in the manufacture of printing ink, paints, gramophone records, linoleum etc. Corundum is being mined at Waidhan in Singrauli Tahsil. Besides, sillimanite, mica, gallium, beryl, pegmatite etc. have also been recently located in this region.

Among the fossil fuels, coal is the only mineral found in the region. Major coal producing fields of the region are: ¹ i) the Umaria Korar field² with its mining centre at Umaria, ii) the Johilla field³ (Eastern and Western) with its mining centres at Bir Singhpur Pali and Nowrozabad respectively, iii) the Sohagpur field⁴ with its mining centres at Burhar, Nargada-Hari-Dafai colliery town, Kotma and Bijuri, and iv) the Singrauli field⁵ with its mining centre at Singrauli. The Singrauli coalfield

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1 The production of coal during 1971-73 was estimated as
2 80 million tonnes in the Umaria Korar tila
3 80 million tonnes
4 40 million tonnes
5 1853 million tonnes
produced nearly 20 per cent of the total coal of the region during 1971-73 and the Sohagpur field nearly 5 per cent in the same period. Mines are partly mechanised but the coal being of inferior quality, mining is never intensive. The Sohagpur coalfield contains some cooking coal, the cooking properties of which increase from west to east. All collieries of the region are located close to the Katni-Bilaspur railway line, and more than 80 per cent of the production is exported. Singrauli coalfield has recently come in the picture of coal production and is growing fast with the completion of the Katni-Bilaspur railway line. Reserves of first grade coal have been estimated to be about 29 million tonnes in Nawanagar field alone. The field is being exploited by the National Coal Development Corporation (NCDC) over an area of 1090 hectares.  

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CHAPTER III

CLIMATE

The region has a typical monsoon type of climate. The scorching heat of May is modified, in places, by extensive floral cover. The region, according to Thornthwait’s first classification, falls in the Tropical Thermal Belt showing a Thermal Efficiency Index of about 150, whereas the Precipitation Effectiveness Index of the region is 45, which gives it a grassland type character. The average distribution of climatic elements with respect to time indicates the prevalence of four main seasons of unequal duration, dry summer (pre-monsoon season), March-May; wet summer (the monsoon season), June-September; transitional period (post-monsoon season) October, November and winter season (December-February), which are marked by distinct characteristics of the weather elements. January is the coldest month of the region when average monthly temperature is between 15°C and 18°C. The condition is almost similar in December but February exhibits a rise of 3°-4°C over January, though the winter still prevails. During December and January the minimum temperature remains well below 5°C and occasionally with the sweep of the western disturbances
and accompanying cold waves, it touches 0°C mark. Relative humidity, especially in the morning, remains high (about 60 per cent) and occasional showers (8.3 cm at Shahdol), contributing about 5 per cent to the annual precipitation, are also experienced. The gradual increase in temperature and fall in relative humidity become more pronounced by March as the former takes a leap of 5°C or more, while the latter declines by 15-20 per cent and thus marks the onset of the dry summer season. The temperature continues to rise till the third week of June when it records maximum temperature above 40°C, although May records the highest average (31.6-33.7°C) and is regarded as the hottest month. In June owing to the outburst of the monsoon, the sudden fall of temperature by over 10°C in the later half brings the average temperature down. But at certain places, due to low humidity and vast expanses of bare rocks, the conditions are aggravated so much so that the temperature occasionally touches 50°C. Intense heating results in the local and short-lived loo and heatwaves. The pre-monsoon showers (contributing only about 2.5 per cent to the annual precipitation) are too weak to moderate the temperatures. The onset of monsoon by mid-June checks the rise in temperature which begins to fall (total fall being around
5°C), though slowly, up to September. The period between mid-June and September end marks the duration of the rainy season. High relative humidity shares over 7 per cent of the annual precipitation.

The region receives rainfall from both the streams of the summer monsoon, the Bay of Bengal and the southwestern branch of the Arabian Sea. The hilly topography of the land very much influences the spatial distribution of rainfall. The high precipices of the Amarkantak Plateau and those of the Pats, such as Mainpat and Jamir Pat etc. are effective barriers to the southeastern stream of monsoon. Consequently, southern and southeastern tracts of the region has the heaviest rainfall of the region (154 cm at Sitapur). But the northern Shahdol and whole of the Sidhi district come in the rain-shadow area and receive the lowest rainfall (98.3 cm at Deosar and 103 cm at Schagpur). The amount of rainfall slightly increases westward from the Schagpur rainfall depression on account of the deep penetration of the south-west Arabian Sea current of monsoon into the

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region through the Narmada corridor (Fig. 3.1). The east-west distributional pattern of rainfall in the region thus stands in sharp contrast with the north-south rainfall pattern of the Indian subcontinent of which this region is a part. Particularly the whole of the Sidhi district and Beohari tahsil and central part of Sohagpur tahsil of Shahdol district form areas of low rainfall ($< 110$ cm), while the remaining parts of the Shahdol district and the entire Surguja district receive heavy ($>110$ cm) rain. The periodical distribution of rainfall in the region is not homogeneous. Most of the rainfall (more than 90 per cent) is concentrated during a span of three months mid-June to mid-September. Spatial pattern of the rainfall in this region is very similar to the annual pattern, and ranges from 136.6 cm at Sitapur to 85.4 cm at Deosar. Winter season contributes 7.0 per cent and summer only 3.0 per cent of the annual rainfall.

A comparative analysis of the rainfall averages for years, ranging between 9 to 59 cm before 1949 and for 18 year after 1950, shows that the amount of rainfall is gradually decreasing, the fall ranging from 19 cm to 34 cm.
Generally, rainfall begins in the third week of June, and by July monsoon spreads all over the region. July and August are the rainiest months of the year. From September onwards, rainfall decreases gradually. Average annual rainy days vary from 58 in Sidhi to 62 in Shahdol and 67 in Surguja. Rainfall intensity reaches these three districts 2.3 cm, 2.0 cm and 2.1 cm respectively. Monthly distribution of rainy days corresponds with the monthly distribution of rainfall. Moreover, the duration of rainfall on the rainy days is concentrated within only a few hours, causing very great run-off, which leads to high intensity of soil erosion.

The failure of the monsoon in the area has become a common feature and rainfall is becoming more and more variable. A statistical analysis of rainfall variability reveals that the years with negative variation are more common than those with positive variation. The devastating calamities of this negative variation are graver and are more enduring. Moreover, the variability of rainfall is not homogeneous over time and space. It has been negative in 10 years and positive only in 8 years over more than half of the area since 1950.
The established inter-relationship between rainfall amount and variability is not found in this region. Spatial variability at places, increases with increasing rainfall and vice-versa. These findings stands opposite to the views held regarding variability. As regard seasonal distribution, winter shows higher variability (53.5 per cent) and summer still higher (98.0 per cent) while in the rainy season it is below 24.0 per cent. Even within a season, wide fluctuations are seen from one month to another and hardly any generalization is possible. Even then, July and August show least variability. Any agricultural development programme, therefore, should take account of this nature of rainfall and its variability in the region.²

From the very beginning, drainage of the region has exerted a great influence on the location of human settlements and on the ways of life of the people living there. The main rivers of Baghelkhand on which drainage of the region depends are Son, Banas, Bapti, Neur, Kanhar, Rer, Mahan etc. There are three drainage systems in the region (Fig.4.1). A description of these is being given in the following paragraphs.

**SON**

River Son is the largest tributary of the Ganges among those coming from the core land of India. It is a sacred river, called 'Erannoboas' by the Greek geographers, and popularly known as Sonbhadra and Mahanda Son ('the auspicious Son') etc.

According to the popularly held belief and from a religious point of view, its source is supposed to be at a place called Sonkunda (22°10'N, 80°46'E), 2.5 km east of the source of Narmada in Amarkantak village of Shahdol district. The small rill which trickles down a forested hillock here makes a waterfall on the
escarpment and joins the south flowing Arpa river. This is not the actual source of the Son. This view is further supported by the standard literature available about its source. The Imperial Gazetteer of India\(^1\) locates its source \((22°42'N, 82°4'E)\) about 20 km east of the so-called Sonkunda. Similarly, in the Indian Empire the source has been given \((22°41'N, 82°7'E)\)\(^2\) about 30 km east of the popularly known one. Besides these conformatory statements about the Son's source lying some where 20-30 km east of Amarkantak, some confusing claims must also be mentioned. In the Imperial Gazetteer itself, a nominal source has been indicated in the Maikal Hills. Names like Sonmuda and Amarkantak plateau has been confused with Amarkantak village and the sanctity assigned to the Son has dragged its source near the more sacred Narmada. Thus, concession has been given to the commonly held belief due to the lack of research into the matter. Actually it rises from the Sonkunda near Son Bachhawar village \((92°43'N, 82°2'E)\), 10 km south of Pendra in Bilaspur district. Its place of origin is

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1. The Imperial Gazetteer of India, Vol.23, p.78.
known as Sonkunda where there are a few Shiva temples and an annual religious fair is held.

The Sonkunda is a saucer shaped natural tank surrounded by three spurs with an average height of around 600 m. Three branches of the Son can be identified here—one coming from the tank and the other two from the surrounding marshy area. All the three join a little below the Sonkunda, flow for about 500 m along a plain and disappear amidst dense forests. The village Son Bachhawar is inhabited by the Gonds who are collectors of forest produce and cultivators. It is connected with Pendra by a footpath.

The Son flows due north and northwest from its source and is joined by the Johilla river near Barwatu village. It elbows its way to the north-northeast near Sarsi and is joined by the Mahanadi just below the tip of its famous bend. Flowing further almost straight along the Kaimur escarp, it is joined by the Banas at Dembha and the Gopad at Burdi. Onward, it descends 250 m to a plain where it is joined by the aihand, the Kanhar and the north Koel and after descending another 150 m it joins the Ganga near amnagar.3

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BANAS, BAPTI AND NEUR

These rivers rise in the range of hills which separates Chang Bhakar from Korea. The Banas has its source in the forest of mauza Barail and flows westward into Kewa, while the Neur takes a northeasterly course into the same state, but both are mere hill streams with rocky beds and frequent rapids, quite unsuitable for navigation.\(^4\)

GOPATH AND HASDO

The Sonhat plateau forms the watershed of streams flowing in three different directions - on the west to the river Gopath, which has its source in one of the ridges of the Deogarh peaks and divides Korea from Chang Bhakar, on the northeast to the Son and on the south to the Hasdo, which runs nearby north and south into the Bilaspur district and eventually falls into the Mahanadi. Its course is rocky throughout, and there is a fine waterfall at Kirwahi.\(^5\)

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5 ibid., p.295.
KA N H A R, R E R A N D M A H A N

These rivers flow northwards towards the Son and the Sankh which takes a southerly course to join the Brahmmansi. In the valley of Kanhar river there is an abrupt descent of about 300 m from the tableland in the east to the fairly level plain of central Surguja, which is here divided into two broad stretches of fertile and well-tilled land. One of these runs southwards to Udaipur and separates the Mainpat from the wild highlands of Khuria in Jashpur; the other bends towards the west and, opening out as it goes, forms the main area of cultivated land in the region.6

TH M A N D

This river flows south from the Mainpat plateau for about 24 km and then turns westward past the Dharamjaigarh, until it reaches the border. It then bends towards the south and forms the boundary of south eastern Surguja for the greater part of its course from that point. Its channel is deeply cut through sandstone rocks in a series of alternate rapids and pools, and so

6 ibid., p.226.
the river is not navigable in any part of its course to Udaipur. About 7 km west of Dharamjaigarh it is met by the Koerga river which likewise rises in the Mainpat hills, and at the southernmost point of the district it is joined by the Kurket river in Raigarh.\footnote{ibid., p.260.}

**THE RIHAND**

The Rihand river, draining an area of about 17,110 sq. km is the largest tributary of the Son. It rises in the Surguja district of Madhya Pradesh at an elevation of about 1,500 km at north latitude $22^\circ38'$ and east longitude $83^\circ1'$, flows in northerly direction through Madhya Pradesh and Uttar Pradesh and joins the Son near Chopan, about 100 km south of Mirzapur town. The river has a total length of 224 km. The river's course is mostly in gorges with alternate pools and rapids and is ideally suited for the generation of hydro power. The Rihand Dam, completed in 1966, is situated across this river, about 47 km upstream of its confluence with the Son and the power station situated here has an installed capacity of 300 MW.\footnote{Report of the Irrigation Commission 1972, Vol. III, Part I, Ministry of Irrigation and Power, New Delhi, pp.112-113.}
**The Mahanadi**

The Mahanadi rises in the Mandla district of Madhya Pradesh at an elevation of 600 m at north latitude 23°7' and east longitude 80°38' and traverses the Madla, Jabalpur and Shahdol districts before joining the Son at Sarai. The river has a total length of 193 km and has a catchment area of 4843 sq. km.

**The Narmada**

The Narmada, the largest west flowing river of the peninsula, rises near Amarkantak in Shahdol district of Madhya Pradesh at an elevation of about 900 m at north latitude 22°40' and east longitude 81°45' in the Maikala range. The river has a number of falls in its head reaches. At 8 km the river drops 21 to 24 m at Kapildhara falls. About four hundred metres further downstream, it drops by about 4.6 m at Dudhdhara falls. Its first major tributary, the Burhner, joins the Narmada from the lift, at the 248 km of its source. Flowing in a generally south-westerly direction through a narrow and

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9 ibid., p.112.
deep valley, the river takes pin-head turns at places. At the 286 km from the source, it turns north-wards and hardly a kilometre further downstream it receives the Banjar, another major tributary from the left, and flows past Mandla town in a number of channels called Sohasradhra. Close to Jabalpur, 404 km from the source, the river drops nearly 15 m at the Dudhdhara falls after flowing through a narrow channel, surrounded by the famous marble rocks.¹⁰

¹⁰ ibid., p.324.
CHAPTER V

FLORA AND FAUNA

The flora and fauna of any region are integral parts of its natural environment. Therefore its knowledge is a prerequisite for any in depth study.

FLORA

The seasonal rainfall and the nature of soils results in a variety of vegetation ranging from grasses and thorny bushes to deciduous trees of commercial significance. Forests constitute one the most abundant and valuable natural resources of the Baghelkhand region. According to land records, all types of forests cover 21.5 thousand sq. km which comes to 46.56 per cent of total geographical area of the region. According to the Forest Department, total forested area in the region is 23.9 thousand sq. km, but actually much of this area is devoid of forest cover. This ratio is much higher as compared with the country as a whole (i.e. 19.7) or with the State of Madhya Pradesh itself (i.e. 33.0).

DISTRIBUTION OF FORESTS

As stated above, forests are the most conspicuous feature in this part of the State. These forests have escaped destruction by the invading armies in the past. Thus the Baghelkhand region could retain extensive forest covers for a long time. In the present century the erstwhile princely states of this region tried to squeeze maximum financial returns from them. Consequently, they were subjected to heavy felling, especially in late forties. Due to ruthless exploitation, most of these forests today appear as sparsely forested wastelands of low commercial value. Only forests which are inaccessible to people are sufficiently dense.

The proportion of forested area varies from 18.71 per cent of total area in Pushprajgarh tahsil to 68 per cent in Bharatpur tahsil (Fig.5.1). There is a close relationship between dissected topography and forest cover. Generally, dissected and rugged parts are widely covered with dense forests. Due to the high relief and stony, shallow and infertile soils, these tracts are unsuitable for cultivation and have not attracted cultivators to clear the natural vegetation cover. These tracts have been able to retain forests due also to the low pressure of population.
In contrast to this, the almost level tracts of Surguja basin, Sohagpur basin, the Son Valley and even of Amarkantak plateau, with sandy and comparatively fertile soils have low forest covers (Fig.5.2). Population density is also high on cultivable land. Consequently, most of the forests have been encroached upon for agriculture. Thus, population pressure and topography have had determining influence on the distribution and occurrence of forests.

**FOREST TYPES**

Natural vegetation of this region belongs to the 'Tropical Deciduous' type of forest, according to Champion (1936). But its structure, composition and status vary from one part to another. For this variation in vegetative cover, climate, geology, soil, biotic and forest history are responsible. Of all the factors, climate (mainly precipitation) is the most important single factor responsible for the wide variety of vegetation types. The net result is the preponderence of resistant species of deciduous types. Besides, the

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2 ibid., p.68.
history of forest exploitation which is full of ruthless felling and over-grazing in recent times, and biotic features have brought about the present state of the vegetation. The differences in vegetation types, thus, are partially climatic, having been aggravated by other factors.

The Tropical Deciduous forests of this region can be divided into two classes:

1. The Tropical Moist Deciduous Forests
2. The Tropical Dry Deciduous Forests

1. **Tropical Moist Deciduous Forests**

Tropical moist deciduous forest of this region form part of northern tropical moist deciduous forests of India. This type includes the important sal forests of India and are found in parts of the region of where rainfall exceeds 120 cm annually. Thus, forests of South Shahdol, Kores and South Surguja Forest Divisions fall within the areas of this type. Most of the trees shed their leaves in autumn only for a short period. These tropical deciduous forests have further been sub-divided into: i) moist peninsular high level sal forests and ii) moist mixed deciduous forests, on the basis of the variety of species.
2. **Tropical Dry Deciduous Forests**

Tropical dry deciduous forest of this region fall within the northern dry deciduous type. Forests of the Sidhi district, North Shahdol and Umaria forest divisions of Shahdol district, and Changhabkhar and North Surguja forest divisions of Surguja district are included in this type of forests. These forests are not truly climatic but they appear to be degraded forms of the moist deciduous types, due to biotic interference (Puri, 1960). This type of forest is divided into i) dry peninsular sal forests and ii) northern dry mixed deciduous forests.

Apart from these forests, teak forests of West Sidhi division belong to the Southern Dry Deciduous Forest types.

According to their composition and important species, these various types of forests are grouped into three classes, for the convenience of study. These are sal, teak and mixed forests.

(i) **Sal (Shorea Robusta) Forests:**

Sal is the most extensively grown tree in this region. It has been observed that the sal forests are
found intermingled with mixed forests but are less so where quartzite pebbles are found. Barkars also possess good quality sal forests. According to the nature of the terrain occupied, sal forests are divided into two sub-types, viz., the plain type and the hill type sal forests.

(a) The Plain Type Sal Forests - These comparatively valuable sal forest occur on low level lands. They are found mostly in reserved forests of Surguja basin, Sohagpur basin and in the Son valley region. The height of the sal trees in such forests varies from 15 to 22 m and average width 61 to 122 cm. Sal constitutes about 70 per cent of the crop and its quality varies from I to III M.P. qualities. Sal, along with similar trees, viz., dhaora (Anogcissus latifolia), sahara (Terminalia belerica), tendu (Diospyros melanocylon), saja (Terminolia tomentosa), bija (Plerocarpus marsupium), karmi (Adina cordifolia), mudhi (Mutragyna parvifolia), saliaha (Baswellia serrata), khamar (Gmelina arborea), and bansa (Albizzia odoratissima) are found in the forests. Achar, amla, sidha, sadhan, jamati, chilhi, bhilwa, kathamhuli etc. comprise the undergrowth. The undergrowth and also contains other evergreen, semi-evergreen shrubs and
climbers. These forests are capable of producing large sized timber, and, therefore, economically, they are very valuable.

(b) Hill Type (Poor Quality) Sal Forests - This sub-type occurs on hill slopes and also on flat tops of hills and covers a major portion of the forested area in the region. The soils are generally poor but their water retention capacity is good. The proportion of sal trees in these forests is as high as in other sal forests but sal trees growing here are shorter in height (12 m to 15 m) and lesser in girth (45 cm to 92 cm). Grazing and firewood collection are very frequent in these forests. In blocks of the South Surguja division, these forests have suffered from a cycle of shifting cultivation. Such type of forests are capable of producing medium size timber, small size poles and firewood.

(ii) Teak (Teetona Grandis) Forests:

Teaks forests are restricted to a few localities in the region. They occur mainly in two areas - on the foothills and slopes of the Kaimur range near Bughwar in Gopadbanas tahsil and parts of Bandogarh tahsil adjoining Jabalpur and Mandla districts. Teak occurs mostly in moist localities along nulas. Teak trees range from young
to middle age groups. Most of the associates of sal forests are found here also. These forests do not have any economic significance due to their limited and restricted occurrence. Regeneration of teak is not satisfactory.

(iii) Mixed Forests:

Off all types of forests, mixed ones occupy as low as three per cent of the forest cover in West Sidhi forests division and as high as 30 per cent in South Surguja division. Thus, a considerable proportion of forested area of the region consists of mixed forests where many species other than sal and teak are found. Sal occurs along depressions and nalas but its predominance decreases in other areas. These forests have characteristics of dry deciduous type and their quality depends upon edaphic-slope factors. Trees of these forests comprise malformed and miscellaneous strands of young to middle age classes. Saja, dhaora, bija, bahera, baunsa, alai etc. dominate these woods. Most of these trees supply small sized timbers. Grasses are also important among the products of these mixed forests.

Commercially the most significance species found in these forests are bamboo (Denderocolamus strictus), khair (Acacia catechu) and solai. Patches of bamboo are
common in Sidhi and Shahdol districts where they cover about 2422 sq. km, and in Surguja district where they cover an area of 1983 sq. km.

CLASSIFICATION OF FORESTS

From the point of view of forest management and implementation of various conservation measures, forests are classified into three categories, viz. reserved, protected, and unclassed forests. Of the total forested area of the Baghelkhand region 6,422 sq. km (28.8 per cent) is classed as reserved forests, in which all private rights and concessions have been abolished. These are the only dense and economically valuable forests in the region. The area of protected forests is about 8,049 sq. km (38.4 per cent) of total forested area. In these forests local people retain certain privileges. These forests, therefore, will never regain their primeval luxuriant growth unless 'nistar' rights are minimised. Another 7,045 sq. km (32.8 per cent) of the forests is neither classified nor managed by the forest department. They usually consist of poor quality wood which can be used as firewood. It is because of the great demand for firewood that these forests are being completed denuded, leading to soil erosion. It will be worthwhile to consider

Collection of fuelwood, fodder, wild fruit and other facilities are provided by the Forest Department, are known as nistar.
the possibility of converting a large portion of the crippled worthless forested area into agricultural land for growing grasses and other fodder crops suitable for the soils.  

Most of tribal communities in the region have their share in forests and since times immemorial they have been dependent to a large extent upon the products of these forests for consumption and barter. Unfortunately, due to shifting cultivation operations many of the valuable forests in the region have been ravaged. Denuded and hills in Shahdol/Sidhi districts bear mute testimony to these depredation.

Forest Produce

Forests of the Baghelkhand region abound in products of commercial value, some of which are: achar or chironji (Buchnia latifolia), dhamun (Grevia restita), semur or semul cotton tree (Bambox malbarium), amaltas (Casia fistula), kachnar (Bauhinia variegata), harsinghar (Byctanttes) vahera (Terminalia vellerica), harra (Terminalia chebula), gular (Ficus glomerta) tinsa (Ongonia

4 Sharma, S.K., op. cit., p.73.
dalbergiodes) and mahua (Bassia lalifolia). Mahua has lofty, spreading foliage useful for consumption and barter.

Important fruit-bearing trees are mango (Mangifera indica), jamun (Enengia jambolina), tamarind (Tamarindus indica), wild plum (Zizyphus jujuba) kairlor wood-apple (Feronia elephantum).

Tendu or ebony (Diospyros tomentosa), leaves of which are locally known as Bidi Patta is a very common and important source of income of the tribals. They collect the leaves and sell them to local dealers.

There are also various types of grasses of commercial value. Mention may be made of babel or bhabhar (Polinia eioponda) utilized in making ropes and for paper manufacture, bharru (Sorghum helenpense), needed for making reed-pens, Andropagon sehenaustus, yielding aromatic rusa oil, and Panicum crus-galli seeds which are gathered and eaten by the tribals. Other harbaceous undergrowths like Acanthakkae and Legniminosea are also important as sources of additional income.

FAUNA

Thick monsoon forests, multitude of streams and vivid topography of the region provide an ideal abode for wild life; but with the gradually increasing pressure of population and expansion of agriculture, the number of wild animals has been greatly reduced.

Several types of carnivores, herbivores, and birds are found in this region. Tigers (Panthera tigrina) are found in sheltered valleys of the large forests. Panthers (Panther pardus or Felis pardus) are smaller in number than tigers. Wild dogs (Ciconal pinus) are rare but jackals (Canis saures) are fairly common. Wolves (Cannes pallepes) stick to riverain tracts. Hyenas (Hyaena straita) are also common.

Wild buffaloes and wild elephants were found in this region, in the past, but at present they are totally absent. With the passage of time, the fauna has become thin and also reduced in vividity. The sambhars (Kusaunicolor or arvers unicolour), a few species of neelgai (Boselaphus lragocanelus), langur (Semnopithecus entellus), common squirrels and flying squirrels (Scivrus indicus) are found in the forests.
Wild boars are found in the forests and are frequent visitors to the crop-laden fields. Monkeys, deer, chitals (Axix axis) wild cats (Felis cat) etc. are some of the other animals that occasionally make their appearance in the village fields.  

Birds

A large number of birds are also found in the region. The pea fowl (Pavo cristatus), the red fungle fowl (Gallus ferruginus) the blue rock pigeon (Columbia livia intermedia) etc. are found in the forests. House sparrows, crows, mynas and parrots, are seen around the human dwellings.  

Fishes

Katla (Catla catla), rohu (Labeo rohita) mirgal (Arrbina mrigela) etc. are found in the streams, paddy field and in tanks. Crabs, toads, tortoises, shells and many other insects are also common in the region, but on the while, the animal population has been reduced very greatly.

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Deforestation

The forest wealth of the region is exposed to a number of dangers. The original vegetative cover of the region has been greatly modified by man, resulting in deforestation. Besides, forest-fires, grazing, illicit felling and the influence of wind and weather have also caused the deforestation of the region.

Vast areas of bamboo forests have also been cleared, bamboo being utilised in the making of paper pulp. The region supplies nearly 20 per cent of the total bamboo requirements of the Orient Paper Mills every year. In 1965-66 alone the region supplied nearly 30,000 tonnes of bamboo, i.e. about 120 million bamboo plants, and the supply is continually increasing. Besides, private agencies also exploit bamboo forests for various domestic and industrial purposes. In Shahdol district alone nearly 220 thousands of bamboo plants have been used for the purpose. This rate of exploitation of bamboo is seriously affecting the forest area of the region. Similarly, the forests are also being exploited in an unplanned manner for timber, construction work and for fuel etc. Human agency further accelerates deforestation by starting fires and illicit felling in the vicinity.
of populated villages, magnitude of which is difficult to estimate.

Uncontrolled and accidental fires cause considerable damage to young saplings and poles. Dense grass growth provides highly inflammable material. In hot season, accidental fires, caused due to intense heat, kill saplings of even upto a height of 6 m.

Grazing is the other menace which varies from light to moderate in the western parts of the region, and moderate to heavy in the eastern parts. In spite of allotment of forest areas for grazing, the cattle generally penetrate the unfenced forests in the vicinity of villages and do considerable damage to young coppice shoots.

The influence of wind and weather may also not be overlooked. Severe hailstorms, though occasional in the region, cause considerable damage to young plants. Torrential rains, common in the Amarkantak Plateau and adjoining areas, result in heavy soil erosion on steep hill sides and remove the nutrients from the soil. Gully erosion in parts of Bharatpur tahsil is most common. The earthy sandstone soils are easily washed away and yawning gullies, in wide parts, have swept the soil from the base
of the trees, leaving bare the roots which hang 1 to 2 m high above the surface of the gullies. Draughts kill a large number of young plants and render regeneration difficult every year, mostly in parts of Sidhi district.

Future Prospects

The prospects of improvement in the vegetative cover in the region may be viewed with optimism in view of the afforestation schemes and role of nurseries, research centres etc. as discussed below.

Afforestation - The biotic complex being naturally suitable for forest growth, afforestation is taking place at a fast rate to counter-balance the exploitation of forests discussed above. The present ecosystem of the region is going to change its nature in the near future. Nurseries, research centres and plantations are playing a vital role in the afforestation of the area under investigation.

Nurseries and Research Centres - A number of nurseries have been established in different parts of the region to provide plants and also to test the growth of different types of plants in different environments. Important research centres are located in Sidhi and
Baghwar ranges of West Sidhi Forest Division, Shahdol, Nipania, Bhalumara, Bhedritalaiya and Kadhnaha of North Shahdol Forest Division etc. Besides, some research centres are conducting experiments with various types of plants in order to find out the best methods of their plantations in the region. Among the plants being tested are eucalyptus, goldmohar, teak, sishoo, amaltas, bija, ipomea, khair, mahogna, myerophylla, bagai grass etc.

**Plantations** - The role of plantations in the afforestation of the region can be looked at with optimism. Eucalyptus, a fast growing tree, has been widely planted in Shahdol and Sidhi districts, and may become the plant of the region/its plantation goes on at the same rate. Its most probable use in near future may be as pulp for manufacturing paper, because the quality and quantity of the bamboo available at present are growing down fast. Besides, it may also be used for fuel, rayon and eucalyptus oil. Other trees, like khair, babul, shishoo etc. have also shown encouraging results. Sandy soils inter-mixed with red and yellow earth and small kankars, are ideally suited for these trees. The plantation of Tun trees, which may have a girth of two metres, may also supply valuable wood for furniture. Sandalwood can also flourish
on the Amarkantak plateau where plantation of its trees has already been started.

The above assessment of natural vegetation reveals the forest potential of the Upper Son Basin.
CHAPTER VI

AGRICULTURAL LANDS AND SOILS

Baghelkhand region is a typical upland basin complex developed largely on the Gondwana basins. Its hilly areas contain very little level land and have a thin cover of soil. The soils of the region are mostly sedentary, exhibiting the in situ development, but extensive pockets of alluvial soils also exist, mainly in the Son trough, Singrauli basins etc.

CLASSIFICATION OF AGRICULTURAL LANDS AND SOILS

The soils of Baghelkhand region may be classified as follows:

A. The local classification adopted by the Revenue Department of the State.

B. The Traditional Classification.

A. Local Classification

The system of land classification in Baghelkhand is based on 'altitude' and 'irrigation facilities'. This

1 Singh, L.R., India: A Regional Geography, Varanasi, 1971, p.46.
system, which was mainly adopted for revenue assessment purposes, is being practised here till now. It is a fact that 'the quality of soil is a minor factor in determining the hill cultivation'. Broadly speaking the worst land, if capable of being irrigated, is of greater value than the best land which is unirrigated. But sufficiently large areas of the region are devoid of irrigation and depend upon seasonal rainfall. Thus the land is locally classified into following on the basis of relative position and gradient.

1. The Don or Low land
2. The Tnar or Upland

1. **The Don**

These are actually terraced fields on slopes. These don fields can be further classified on the basis of elevation, site, fertility and soil moisture.

(a) **Chawar Don** – It is the first terrace of don and is adjacent to the end of 'tnar' or upland. It is also

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known as Sokra don. These dons are mainly used for cultivation during the paddy rabi season.

(b) Garha Don - This don is next in quality and is mainly exploited for cultivating rice and maize.

(c) Kudar Don - It is the best quality don which possesses highest fertility and moisture contents. As a rule, the fertility and moisture contents are reduced as one goes up from the Kudar don to the Chawar don. The quality and quantity of crops are also lowered accordingly. The don are generally utilized for growing paddy.

2. The Tnar or Upland

The 'Tnar' is flat land. It is almost level or it may show a gentle slope. According to the location and fertility of the soil, the 'tnar' land is further divided into following categories.

(a) The Bari - Land attached to houses which is used as a kitchen garden is known as the 'Bari tnar'. Generally vegetables, fruit for domestic use and paddy nurseries are prepared in the Bari tnar. Land used for the rice seedlings is called 'the Bira bari'. The bari is a well-manured and sufficiently irrigated land.
(b) **Dehari Tnar** - Outside a village settlement, patches of uplands are known as 'Dehari tnar' or 'Chaur baries'. These tners are used for growing different varieties of oil seeds and pulses. Those tribals who can afford to have wells grow various types of vegetables and rice seedlings on such lands.

(c) **Rugari Tnar** - This tnar is comparatively less fertile than the 'Dehari tnar' and hence it is cultivated in alternate years. Sometimes it is left fallow for two years. Generally, the coarser varieties of crops are grown in rotation on these lands. The upland paddy 'Goradhan', millets 'Gondali and Marua', pulses oilseeds etc. are grown on the 'Rugari tners'.

The soils of the Baghelkhand region are mostly sedentary, exhibiting the *in situ* development but extensive pockets of alluvial soils also exist mainly in the Son trough, Tons valley, Singrauli Basin etc.

**B. Traditional Classification**

Often the soil groups partake of their characteristics from their parent rocks. The studies made so far help in recognising as many as seven broad types of soils in the region (Fig.6.1):
(i) The black cotton soil on the Deccan Trap
(ii) Red and brown sandy soils, sandstone and shales
(iii) Laterite or lateritic soils
(iv) Mixed black red and yellow soils
(v) Forest soils (Red and brown)
(vi) Mixed, black, red and yellow soils redeposited in the Valley
(vii) Calcareous soils on Limestone.

(i) The Black Cotton Soils on the Deccan Trap

'Regur' is a name given to the soil covering the trap rock of the Plateau of Malwa after which the Plateau has been designated. The Black Cotton Soil is the most typical soil developed on the lava country. It is a fine, dark, black soil varying in colour, composition and fertility. The soil is highly calcareous and very sticky when wet. Its greatest advantage lies in its high water retaining capacity; the soil therefore requires little or no irrigation. When it is dry, it breaks into fragments, with broad deep cracks like fissures. The constituents of 'regur' have not yet received much attention and have not been analysed.

The profile of a typical Black Cotton Soil is from two inches to six inches thick in situ but when
transported, it may be more than forty inches thick. Ordinarily the depth of the Black Cotton Soil, utilized for the growth of cotton, does not exceed fifteen feet but deeper soils are used for wheat, gram or other winter crops. The 'regur' is mainly a clayey loam, dark grey, dark brown, or bluish black to black in colour. The Black Cotton Soil of the southern part of Shahdol district with a rainfall of about fifteen to twenty-five inches annually, usually contains more calcium carbonates than those of the eastern parts of the region with a rainfall of about forty to sixty inches. The calcium carbonate is always seen between the disintegrated bed-rocks. It is characterised by a high percentage of magnesium carbonates (6.8 per cent) and iron oxides (9.10 per cent). The black colour of the soils appear to be either due to the carbonaceous elements of the soils or the organic salts of iron.

Apart from the transported Black Cotton Soils, they are associated to some extent with granite and sedimentary rocks. Under suitable climatic conditions they also originate from the alluvium of river valleys. Bruce Foote believes that 'regur' might be formed by
organic alteration of the primary products of weathering in almost any rocks, provided they are sufficiently argillaceous.\(^3\)

Black Cotton Soils in the region covering the southern part of Shahdol district, are derived from rocks belonging to either the Gondwana or the Vindhyan systems. The general characteristics of these soils are therefore more or less similar to those of the Black Cotton Soils except that they are very poor in both total and exchangeable calcium, and due to this as well as due to higher rainfall in these areas, these soils are not suitable for growing cotton.

(ii) **Red and Brown Sandy Soils on Sand Stones and Shales**

Vast areas of light sandy red and yellow soils are found on the Gondwana and Vindhyan formations. The colour of these soils varies from greyish yellow to yellow. These soils vary in depth and readily respond to irrigation and manuring. Generally they are deficient in phosphoric

acid which usually ranges from 0.2 to 0.7 per cent, while the PH value lies between 5.4 and 8.4 per cent. The humus content is variable but in most of the soils it accumulates within first six inches. The sandy soils are mainly rice-growing ones but are also admirably suited to garden crops and sugarcane where irrigation facilities are available all the year round. The important localities where these soils are abundantly found are the western parts of Surguja district, the southern parts of Sidhi district, and north-eastern parts of Shahdol district.

(iii) Laterite or Lateritic Soils

Laterite is a thin gravelly, reddish loam, usually with a profile of a few inches. It may also lie on surface, being a foot thick. The redness of the soil is due to the oxides of iron and aluminium consisting of free quartz, lime and magnesia. Laterites are denuded of humus and exchangeable bases and left with more or less acid reaction. The laterites on high level are not retentive of moisture and are of little value for agriculture. The low-level laterites are found only on flat surfaces and not on the slopes. They are frequently conglomeratic, including fragments of gneisses and other rocks. Some
of them are due to reconsolidation of fragments derived from high levels. The soils during their downward creep intermingle with other materials, finally giving rise to the heavy loams and clays. Due to the heterogeneous origin of such lateritic soils they respond better to agriculture than those derived from high level. Laterite is very good material for buildings and road lining.

In Baghelkhand region this soil is not confined to any locality but a thin covering of it is widely spread all over the three districts. Laterite is not at all fertile and grows only minor millets. It has no moisture retaining capacity and water percolates downward leaving the upper level dry.

(iv) **Mixed Black, Red and Yellow Soils on Archeans and Dharwarians**

This is the largest soil group of India. It covers various types of rocks of the Archaen system. The parent rocks are mainly granites and gneisses, though sandstones, slates and shales of the Cuddapah and Vindhyan system have also contributed to the formation of this soil. The soils formed of shales are finer in texture than the sandy one. The red colour of the soil is due to the iron content derived originally from ferro-magnesium
silicates, but the colour varies greatly from place to place and from field to field, being brown, yellow, grey and even black. This change in colour is not only due to the variation in iron content but also due to imperfect hydration as a result of poor drainage. The upland soils are usually red, thin and gritty but those of the plains and valleys are, darker and comparatively more friable compared with black soil; the red soils as a group are deficient in humus, lime, magnesia, alkalis (though their potash contents are sometimes fairly high), nitrogen and phosphorus. Their soluble base exchange capacity is low. The soils are usually silicious, argillaceous and aluminous with much free quartz in the form of sand which results in their inadequate clay fractions. The productivity of these soils varies with the amounts of rainfall.

These soils are found over a large area in the region, covering the western parts of Suguja district, western parts of Shahdol district and southern parts of Sidhi district. The soils of the uplands are exceptionally poor but those of the lowlands respond well to irrigation.

(v) Forest Soils (Red and Brown)

Taking into account the fact that about 25 per cent of the total geographical area of Madhya Pradesh and
46 per cent area of the Baghelkhand region consists of forest, the study of the nature of forest soils becomes very important from the point of view of agriculture as well as afforestation. The forest soil is usually formed by the deposition and decomposition of organic matter derived from the forest growth. It is not necessary that this type of soil should always be found at high altitudes. On the hill tops of Vindhyan hills and the plateaus of the region i.e. places where there is sufficient forest growth, the forest soil is predominant. The soils differ from one another in some respects; the forest soils in Vindhyan are generally formed by the weathering of basalt and sandstones, while in other regions they are derived from the unclassified granites and gneisses.

Generally forest soils are formed under two conditions, viz., acid conditions i.e. acid humus and low base status and less acidic conditions i.e. with high base which is favourable for the formation of brown earth. Later these soils undergo laterization. The investigation so far done shows that the silica, P0₂ and free SIO₂, and silica combined with S₁O₂ go hand in hand with the growth of vegetation, particularly in the teak growing areas of the region. Hence this soil is mainly spread over the
teak forest areas of Baghelkhand region. There are, however, exceptions, like forests occurring in areas of sal forest e.g., in Surguja district.

From the point of view of agriculture, these soils are not very important because the soils on the hill tops are often removed by torrents, leaving behind bare hills. On the contrary, the low lying forested areas become so acidic that no crop can be grown except certain small millets like 'Koson', 'Kukri', 'Korsa' and 'Ragi' etc.

(vi) Mixed, Black, Red and Yellow Soils, Redeposited in the Valleys

In the valleys of Son and its tributaries there are alluvial soils. These soils have been deposited by water. Their general depth is 100 feet. The alluvial soils are deficient in potash. They are most fertile soils. They grow a wide variety of crops, including rice, wheat and sugarcane. The alluvial soils may be divided into two major groups viz., the old and the new alluvium. Old alluvium occurs in the Son Valley, particularly in the southern part of Sidhi district. The new alluvium is not found in the region.
(vii) **Calcareous Soil on Limestone**

Calcareous soil of lacustrine origin is well developed on limestone rock in the northern parts of Sidhi district, northwestern parts of Surguja district and northeastern parts of Shahdol district. The soil is rich in carbonate of lime which often occurs as nodules locally known as 'Chunakankar'. The soil is white or brown in colour. Phosphoric acid and humus contents are quite deficient in the soil. The calcareous soil is not very fertile and grows a few small millets like, 'bajra', 'kodon' 'kulki' etc.

**Soil Erosion and Conservation**

On every type of land, save that which is perfectly flat, water erosion, physical destruction of the soils, occurs. It challenges man along three distinct lines - dessication, erosion and depletion. Each or all of them become crucial under certain environmental conditions. Of the three, the latter two need immediate attention in the region.

The Problem of Soil Erosion - The original thin soil cover of the region is under serious threat from such erosion. The erratic nature of wind and weather of the region, the unmanaged forests, the removal of tree roots and the litter
of leaves which anchor soil in a place, and unscientific agricultural methods have accelerated the rate of soil erosion in the region. The belt of heavy soil erosion runs through the middle of the region in a roughly north-east south-west direction. Besides, a zone of heavy to medium soil erosion may be marked in the south-western and eastern portions of Shahdol district.

Both sheet and gully types of erosion have badly affected the region. Run-off caused by heavy monsoon downpour causes extensive sheet erosion. It has been extensive in overgrazed, heavily felled and open lands. The undulating surface of the plateaus seems to have greatly been affected by sheet erosion which is also prominent in eastern Shahdol district and in the south-western portion of the region.

Gully erosion of severe intensity has been observed in Bharatpur tahsil area. The earthy porous sandstone soils have been extremely eroded, with 'A' horizon being practically absent in most parts. In some cases 'B' horizon has also been damaged, especially in areas of steep slope. Yawning gullies are easily noticeable even in densely forested areas where erratic and seasonal rainfall has been the most dominant factor, among other natural
agencies. The heavy downpour limited to only two or three months of the rainy season causes maximum run-off. Small hill streams of short duration get extra erosive power, and thus active headward erosion forms deep gullies. The load even exceeds the carrying capacity of streams, and a vast amount of sand may be seen strewn over a large forest area.

The Problem of Soil Depletion - Among the chemical elements utilized by plants in their growth, phosphorus, nitrogen and potassium are often found in critical percentages in common soils. They are never abundant, they may be depleted quickly, and hence they have been termed as the soil elements of "transcendent importance". In the soils of the Baghelkhand region, phosphorus is one such element that is deficient. More than 50 per cent of the soils of the region have low content of phosphorus. About 65 per cent soils of Bharatpur tahsil and surrounding areas have low content of phosphorus. Content of potassium is not critical but is not much encouraging either. On an average, 17 per cent of the soil has a low content of phosphorous and 30 per cent has a high content. The content of organic carbon is also low, about 58 per cent of the soils having low content.
The serious threat posed by the problems cited above calls for a review of soil conservation and remedial measures in the region.5

Soil Conservation

Steps have been taken to check the menace of soil erosion in the region. Soil conservation schemes have covered about 12,720 hectares of the area in Shahdol district, about 28,200 hectares in Sidhi district, and about 42,000 hectares in Surguja district. Contour bunding is the common measure so far adopted with considerable success in most parts. Machine and manual labour are both adopted for bunding but the share of the latter exceeds that of the former. Wide areas have been bunded in Sihawal, Sidhi, Majhouli and Rampur circles of Sidhi district.

The remedies of the damage caused by erosion are twofold.

(i) Prevention of sheet washing or soil planation which precedes gullying by growing grasses and other forms

of natural vegetation suitable to the area, and by contour bunding.

(ii) External vigilance and constant warfare against the gully where it has formed.

Besides, the gullies may be checked by damming, planting the slopes with proper grasses, improving the existing plant cover, scientific farm management, contour ploughing, terracing etc.

Experiments have shown that only contour bunding would not suffice to check the menace in all areas. In Bharatpur area the bunds are easily washed away by rains. This method has been used by the local people in an indigenous form. Construction of terraces is logical from both points of view of topography and agriculture, particularly in areas like Changbhakar. It will not only check soil erosion, but the flat surface of terraces will also facilitate cultivation of paddy.

The soils are not only being washed away but their fertility is also gradually decreasing. This is because of faulty agricultural practices. Crop rotation, mixed farming and addition of chemical fertilizers, which are lacking at present, can check this reckless mining of fertility and leaching of the soils.